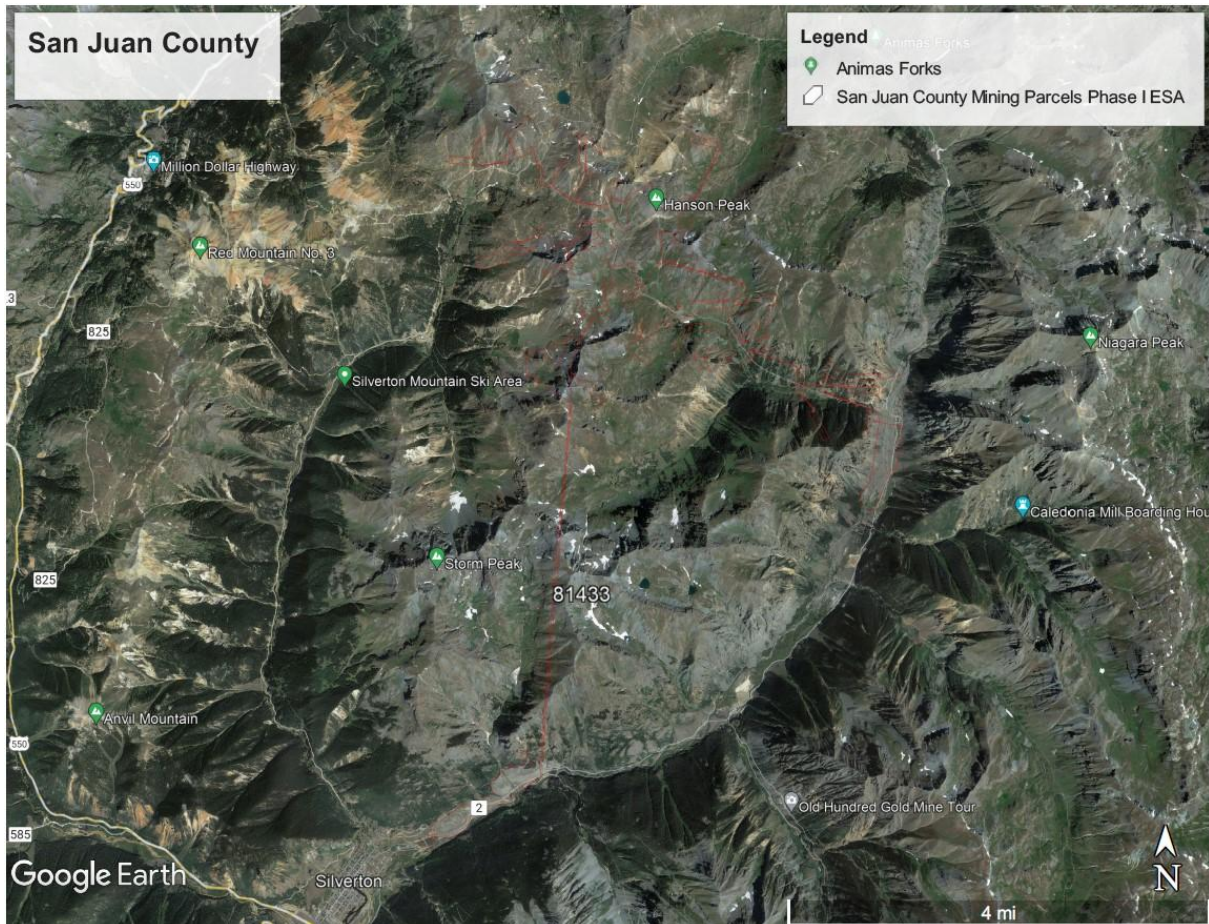


# PHASE I ENVIRONMENTAL SITE ASSESSMENT REPORT

## San Juan County Mining Claim Parcels

### Silverton, Colorado



Prepared by

Iron Woman Construction and Environmental Services LLC

12503 East Euclid Drive

Centennial, Colorado 80111







December 20, 2022

William Tookey  
San Juan County  
PO Box 466  
Silverton, Colorado, 81433

Re: Phase I Environmental Site Assessment  
Sunnyside Gold Corporation Mining Claims  
San Juan County, Colorado 81433

Dear Mr. Tookey,

Iron Woman Construction and Environmental Services LLC has performed a Phase I Environmental Site Assessment (ESA) in conformance with the scope and limitations of ASTM E2247-16, Standard Practice for Environmental Site Assessment Process for Forestland or Rural Property of former mining parcels located in San Juan County, Colorado 81433 that are under the ownership of the Sunnyside Gold Corporation (Properties).

This Phase I ESA did not reveal evidence of Recognized Environmental Conditions (RECs) in connection with the Properties.

This Phase I ESA did not reveal evidence of Historical RECs in connection with the Properties.

This Phase I ESA revealed evidence of Controlled RECs in connection with the Property.

According to ASTM E2600-15, based upon the absence of known or reported hazardous chemicals or volatile organic compounds released to the Properties or surrounding immediate area, a vapor encroachment condition can be ruled out.

We appreciate the opportunity to provide our services to you. Please feel to contact us if you have any questions or comments.

Sincerely,

**Iron Woman Construction and Environmental Services LLC**

A handwritten signature in blue ink, appearing to read 'Steven B. Hoffman'.

Steven B. Hoffman, P.G.  
Program Manager

A handwritten signature in black ink, appearing to read 'Shelly Hoover'.

Shelly Hoover, P.E.  
Director of Environmental Compliance

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## Project Summary

Iron Woman Construction and Environmental Services LLC (IWC) has performed this Phase I Environmental Site Assessment (ESA) at the request of the San Juan County Board of Commissioners of the former mining claim parcels located in Silverton, San Juan County, Colorado 81433 and are owned by the Sunnyside Gold Corporation (SGC) (Properties).

This Phase I ESA did not reveal Recognized Environmental Conditions (RECs) in connection with the Properties.

This Phase I ESA did not reveal evidence of Historical RECs (HRECs) in connection with the Properties.

This Phase I ESA revealed evidence of Controlled RECs (CRECs) in connection with the Properties. The Properties are former mining claim sites located on approximately 1,202 acres that were part of active mining in the County from the 1870's until 1991. Over 400 abandoned or inactive mines are present in the area where the Properties are located. As a result of this mining, contamination from heavy metals and sediments impacted the soil, groundwater, and surface water that were dispersed over three drainages. Due to this contamination, the United States Environmental Protection Agency (EPA) listed the area as the Bonita Peak Mining District Superfund site and added it to the National Priorities List on September 9, 2016.

According to the Colorado Department of Public Health and Environment, the SGC mining claim parcels have been investigated and remediated to the satisfaction of the EPA. The SGC portals and adits have been secured in compliance with the Colorado Division of Reclamation, Mining and Safety regulations.

As outlined in the Consent Decree issued by the United States District Court for the District of New Mexico and filed April 29, 2022, the SGC Properties included in this ESA have been remediated to the satisfaction of and in compliance with EPA requirements and monetary settlements to affected stakeholders by SGC have been fulfilled.

Additional environmental assessment and remedial actions will be performed by EPA and as required by the Intern Record of Decision (May 2019) and the Adaptive Management Site Management Plan (November 2020) to further address the following:

- Water discharge from the Terry Tunnel;
- Mayflower Mill tailings pile 4; and
- Groundwater treatment remedial investigation and feasibility study.

Pursuant to ASTM E2600-15 and based upon the absence of known or reported hazardous chemicals or volatile organic compounds released to the Properties or the surrounding immediate area, a vapor encroachment condition can be ruled out.

	Report Section	No Further Action	REC	CREC	HREC	Other Environmental Considerations
3.0	User Provided Information			✓		
4.1	Regulatory Report Summary			✓		
4.3	Historical Use Information on the Subject Property			✓		
4.4	Historical Use Information on Adjacent Properties			✓		
5.0	Site Reconnaissance			✓		
6.0	Interviews			✓		



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## 1.0 INTRODUCTION

Iron Woman Construction and Environmental Services (IWC) was retained by San Juan County Board of Commissioners (User), to perform a Phase I Environmental Site Assessment (ESA) of former mining claim parcels located in San Juan County, Silverton, Colorado 81433 (Figures 1, 2 and 3, Appendix A). A listing of these parcels (Properties) is provided in Appendix B. It is our understanding that these Properties are owned by the Sunnyside Gold Corporation (SGC) that would like to transfer ownership to San Juan County. The User has requested this Phase I ESA to identify potential Recognized Environmental Conditions (RECs), as defined by ASTM Standard E2247-16, in connection with the Properties and to satisfy one of the requirements to qualify for the innocent landowner, contiguous Property owner, or bona fide prospective purchaser limitations under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (42 U.S.C. §9601) (hereinafter, the “landowner liability protections,” or “LLPs”). The methods used for this ESA are in general conformance with ASTM E2247-16, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process for Forestland or Rural Property.

IWC's investigation included personal interviews, background research of legal filings in connection with the Properties, reviewing database reports, historical aerial photographs and topographic maps, reviewing available local, state, and federal regulatory records regarding the presence of petroleum products and/or hazardous materials and a reconnaissance of the Properties and adjacent properties.

IWC contracted Environmental Risk Information Services (ERIS) to perform a computer database search for local, state, and federal regulatory records pertaining to environmental concerns for the Properties and properties in the vicinity (see Section 4.0).

Services rendered were completed in accordance with the standard practice guidelines established in ASTM E2247-16, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, for Forestland or Rural Property and the United States Environmental Protection Agency's Standards and Practices for All Appropriate Inquiries (AAI), 40 CFR, Part 312.

### 1.1 Scope of Services

The scope of services was to perform a Phase I ESA in a manner generally consistent with ASTM E2247-16. A Phase I ESA is intended to inspect the Properties with respect to petroleum products and the hazardous substances listed in CERCLA (42 U.S.C. §9601). A Phase I ESA is not intended to take the place or be considered an environmental or regulatory compliance inspection.

This Phase I ESA was conducted to provide a reasonable level of investigation to identify RECs in connection with the Properties. As defined by ASTM standards, the term "REC" means (1) the presence of hazardous substances or petroleum products in, on, or at the Property due to a release to the environment; (2) the likely presence of hazardous substances or petroleum products in, on, or at the Property due to a release or likely release to the environment; or (3) the presence of hazardous substances or petroleum products in, on, or at the Property under conditions that pose a material threat of a future release to the environment. A de minimis condition is not a REC.

A Controlled REC (CREC) is a REC affecting the Property that has been addressed to the satisfaction of the applicable regulatory authority or authorities with hazardous substances or petroleum products allowed to remain in place subject to implementation of required controls.

A Historical REC (HREC) pertains to a previous release of hazardous substances or petroleum products affecting the Property that has been addressed to the satisfaction of the applicable regulatory authority or authorities and meeting unrestricted use criteria established by the applicable regulatory authority or authorities without subjecting the Property to any controls.

## **1.2 Limiting Conditions**

The findings and conclusions contain all the limitations inherent in the methodologies that are referred to in ASTM E2247-16. Limitations or exceptions encountered during the completion of this ESA occurred due to the rugged mountainous terrain preventing a physical inspection of some parcels. Generally, the parcels that were not physically inspected were observed using telescopic equipment.

## **1.3 Deviations and Exceptions**

There were no notable deviations or exceptions from the scope of work.

## **1.4 Significant Assumptions**

There is a possibility that even with the proper application of these methodologies there may exist on the Properties conditions that could not be identified within the scope of the ESA, or which were not reasonably identifiable from the available information. IWC believes that the information obtained from the records review and the interviews concerning the Properties is reliable. However, IWC cannot and does not warrant or guarantee that the information provided by these other sources is accurate or complete. The methodologies of this ESA are not intended to produce all-inclusive or comprehensive results, but rather to provide San Juan County Board of Commissioners with information relating to the Properties.

## **1.5 Special Terms and Conditions**

The conclusions and findings set forth in this report are strictly limited in time and scope to the date of the evaluations. The conclusions presented are based solely on the described and not on scientific tasks or procedures beyond the scope of agreed-upon services. No subsurface exploratory drilling or sampling were performed under the scope of this work.

Some of the information provided is based upon personal interviews, and research of available documents, records, and maps held by the appropriate government and private agencies. This information is subject to the limitations of historical documentation, availability, and accuracy of pertinent records, and the personal recollections of those persons contacted.

## **1.6 User Reliance**

The findings, opinions, and conclusions of this Phase I ESA are for the confidential and exclusive use of San Juan County Board of Commissioners, its affiliates, employees, agents, successors, and assigns. Reliance on this Phase I ESA for any use by parties other than specifically stated is prohibited without the express written consent of IWC and San Juan County Board of Commissioners.

## **2.0 SITE INFORMATION**

### **2.1 General Description and Site History**

The Properties are located in northeast San Juan County and consist of 31 parcels that total approximately 1,202 acres. These parcels are located east of San Juan County Road 110 and north of San Juan County Road 2 and are owned by SGC. Site Location Maps are provided as Figures 1 and 2 and the parcels included in this ESA are illustrated on Figure 3 (Appendix A). A listing of the parcels is provided in Appendix B.

Mining began in San Juan County in the 1870's and ended in 1991 when the Sunnyside Mine ceased operation. The Sunnyside Mine was the last significant mining operation in the Bonita Peak Mining District (BPMD) and was the largest and most productive mine in the area. The Sunnyside Mine is situated at the



headwaters of Eureka Gulch near historic Lake Emma at an approximate elevation of 12,320 feet. SGC operated the Sunnyside Mine from 1985 to 1991 and acquired ownership of the Mine in 1992.

As a result of mining in the BPMD, contamination to soil, groundwater, and surface water from heavy metals and sediments were dispersed over three drainages in the watershed. Over 400 abandoned or inactive mines are present in these three drainages.

During the 1990's the EPA and the Colorado Department of Public Health and Environment (CDPHE) conducted a Superfund Site Assessment of the area. This assessment identified severe impacts to aquatic life in the Upper Animas River and its tributaries from heavy metals. SGC and the Colorado Water Quality Control Division entered into a Consent Decree on May 8, 1996 which resolved litigation related to the State's Water Quality Control Act.

On September 9, 1996, the Bonita Peak Mining District Superfund site was added to the National Priority Pollutant List (NPL). Between 1996 and 2004, SGC installed 11 bulkheads within the Sunnyside Mine to stop the uncontrolled flow of water from the Mine. During this time period, other mine portals and adits associated with SGC were closed and safety secured in accordance with Colorado Division of Reclamation, Mining and Safety (DRMS) regulations. These closures have been inspected for compliance by representatives of the state of Colorado and the EPA.

From 2005 through 2014 SGC, EPA, the US Bureau of Land Management, and the state of Colorado conducted remedial investigation and reclamation activities in the Upper Animas Watershed. These efforts have included diverting water runoff away from and capping mine waste piles, moving mine waste piles away from drainages, consolidating mine waste piles, creating sediment retention ponds, placing bulkheads in draining adits, and re-vegetating mine waste piles.

The BPMD is organized into five operable units (OUs):

- OU1: Site-wide – OU1 encompasses the entire Bonita Peak Mining District Superfund site.
- OU2: Mayflower – OU2 includes the Mayflower Tailing Ponds No. 1, No. 2, No. 3, and No. 4 and the Mayflower Mill and Tailings Study Area.
- OU3: Bonita Peak Groundwater System – OU3 generally includes the saturated and unsaturated workings of the Sunnyside Mine, associated drainage and haulage tunnels, nearby mines not known to be connected to the Sunnyside Mine workings (e.g. Red & Bonita Mine and Gold King Mine), and the surrounding geographic area that may be hydraulically connected or influenced by current and/or historical releases from or due to the management of these mines.
- OU4: Ben Franklin Mine - The Mine is located immediately below and east of the confluence of the two headwaters of Eureka Gulch.
- OU5: London Mine - Located located north of Burrows Creek, a tributary to the North Fork of the Animas River.

During an inspection of the Gold King Mine outer bulkhead by EPA personnel on August 5, 2015, a release from the Mine of approximately 3 million gallons of water containing metals and sediments occurred. This discharge entered into Cement Creek which is a tributary to the Animas River. SGC entered into a Consent Decree with the United States District Court for the District of New Mexico on May 11, 2017 for this incident.

The EPA issued a "Unilateral Administrative Order for Remedial Investigation" on March 18, 2018 for investigation of the Groundwater System as OU3. Under this Order, EPA performed remedial investigation and feasibility studies that identified 48 mining related source areas of contamination from historic hard rock mines, tailings, and waste rock within Mineral Creek, Cement Creek, and Upper Animas River drainages. These areas include 35 mines, seven tunnels, and four tailings impoundments. Known contaminants associated with both waste rock and water discharges from adits include arsenic, cadmium, copper, manganese, and zinc.

The EPA signed an Interim Record of Decision (IROD) for OU1 on May 20, 2019 that identified 23 source areas and two dispersed campgrounds for interim remedial actions (IRAs). These IRAs included stabilization of the mine source areas and measures to reduce contaminant loading to surface waters.

The EPA adopted an Adaptive Management Site Management Plan (AMP) for the Bonita Peak Mining District in November 2020 to provide the framework for decision making for the continuous planning, remedial implementation, and assessments to prioritize and manage environmental processes in the BPMD.

San Juan County Ordinance Number 2020-01 was adopted on December 15, 2020 for the regulation of land use within the BPMD. This ordinance establishes San Juan County with jurisdiction over Mine Waste Source Areas to control and regulate land use within unincorporated San Juan County where residual mine waste and remediation components exist, specifically the BPMD Superfund site. According to the Ordinance, the EPA and CDPHE have performed and will continue to conduct CERCLA response actions including, but not limited to, response actions selected in the IROD and possible other future CERCLA response actions, at portions of the BPMD Superfund site (collectively referred to as "CERCLA response actions").

SGC satisfied the requirements of the Consent Decree and was released of further environmental liability associated with these Properties, as filed on April 29, 2022 with the United States District Court for the District of New Mexico.

A copy of the regulatory documents are provided in Appendix C.

## 2.2 Property Description

San Juan County Assessor's parcel information is provided in Appendix D. A summary of the assessor's parcel numbers, acreages, and remedial status is listed below.

Parcel ID	Acreage	Ordinance 2020-1 Remedial Status
47730190030005	17.7	Remediated
47730190030006	13.8	Remediated
47730190050004	51.34	Remediated
47730300020001	41.65	Remediated
47730300020002	93.36	Remediated
47730300020003	23.84	Remediated
47730300020004	19.32	Remediated
47750090050001	25.28	Remediated
47750100050003	42.49	Remediated
47750100050031	8.0	Remediated
47750100050051	2.41	Remediated
47750110050002	89.17	Remediated
47750110050022	9.74	Remediated
47750130050001	43.92	Remediated



Parcel ID	Acreage	Ordinance 2020-1 Remedial Status
47750130050003	26.11	Remediated
47750140050002	194.92	Remediated
47750150050001	35.66	Remediated
47750150050002	17.43	Remediated
47750150050011	18.9	Remediated
47750160050006	24.26	Remediated
47750220050003	113.44	Remediated
47750230050001	10.33	Remediated
47750230050002	44.27	Remediated
47750240050001	89.19	Remediated
48290090010033	22.73	Remediated
48290090010039	32.83	Remediated
48290090010041	5.91	Remediated
48290090010042	12.66	Remediated
48290090010043	38.14	Remediated
48290090010044	10.33	Remediated
48290100010006	23.43	Remediated

## 2.3 Regulatory Filings

A summary of significant regulatory filings by the EPA and states of Colorado and New Mexico on the SGC Properties is provided below. This is not a listing of all regulatory filings pertaining to the Properties. A copy of the documents is provided in Appendix C.

- May 8, 1996: Consent Decree between SGC and the Colorado Water Quality Control Division, for the resolution of litigation related to the State's Water Quality Control Act.
- September 9, 2016: The EPA lists the area as the Bonita Peak Mining District Superfund site and added it to the National Priorities List.
- November 15, 2016: State of New Mexico files Motion v. EPA, ET AL - includes SGC.
- May 11, 2017: The EPA and SGC enter into an Administrative Settlement Agreement and Order on Consent for Remedial Investigation.
- March 15, 2018: A Unilateral Administrative Order for Remedial Investigation is issued by EPA for investigation of the Groundwater System as Operable Unit 3.
- May 20, 2018: Interim Record of Decision for the BPMD Superfund Site Operable Unit 1 San Juan County, Colorado.
- September 3, 2020: Administrative Order Directing Compliance with the Request for Access to the Mayflower impoundment area.
- November 2020: Adaptive Management Site Management Plan for the BPMD San Juan County, Colorado is adopted.

- December 15, 2020: San Juan County Ordinance Number 2020-01 for the regulation of land use within the BPMD.
- December 10, 2021: Consent Decree, United States District Court for the State of Colorado, The State of Colorado Through the Colorado Natural Resources Trustees v. Sunnyside Gold Corporation.
- April 28, 2022: Consent Decree, United States District Court for the District of New Mexico, Case 1:18-md-02824-WJ, Document 1634.
- June 14, 2022: Settlement Agreement Between New Mexico and the US (re State of New Mexico v. USEPA, et al., 1:16-cv-00465) (“the New Mexico Action”).

## 2.4 Physical Settings

### Physical Setting Sources Physical setting source information is included in Appendix E.

#### Surface Water:

During the site reconnaissance, stormwater runoff was not observed. Based upon the local slope of the individual Properties in this mountainous terrain, runoff will occur from the higher elevations to the lower elevations and ultimately to the tributaries draining into the Animas River. A review of the National Wetlands Inventory Map published by the United States Department of the Interior, Fish and Wildlife Service, revealed the following parcels that are in a wetlands designated area:

Parcel	Designation
47730190030005	Portions of this parcel are located in a Freshwater Pond area.
47730300020001	Portions of this parcel are located in a Freshwater Pond area.
47730300020002	Portions of this parcel are located in a Freshwater Pond area.
47730300020003	Portions of this parcel are located in a Freshwater Pond area.
47730300020004	Portions of this parcel are located in a Freshwater Pond area.
47730300020005	Portions of this parcel are located in a Freshwater Pond area.
47750090050001	Portions of this parcel are located in a Freshwater Emergent Wetlands.
47750140050002	Portions of this parcel are located in Freshwater Emergent Wetlands and Freshwater Pond areas.
47750150050001	Portions of this parcel are located in a Freshwater Pond area.
47750150050002	Portions of this parcel are located in a Freshwater Pond Area.
47750230050001	Portions of this parcel are located in a Freshwater Pond area.
47750240050001	Portions of this parcel are located in Freshwater Emergent Wetlands and Freshwater Pond areas.
48290090010033	Portions of this parcel are located in a Freshwater Pond area.
48290090010039	Portions of this parcel are located in a Freshwater Pond area.
48290090010041	Portions of this parcel are located in a Freshwater Pond area.

Parcel	Designation
48290090010043	Portions of this parcel are located in Freshwater Emergent Wetlands and Freshwater Pond areas.
48290090010044	Portions of this parcel are located in a Freshwater Pond area.

### Geology:

The San Juan Mountain Range consists of geologic units that range in age from Precambrian crystalline rocks to late Cenozoic deposits of the San Juan volcanic field. The San Juan Mountains were created during tectonic building as two continental plates came together that pushed mountain peaks to over 14,000 feet in elevation. These tectonics resulted in volcanic activity with magma that produced rich veins of gold and silver deposits. During numerous periods of volcanic activity, andesitic lava and ash filled the valleys and fissures. After the eruptions ended, the pools of subsurface magma shrank creating calderas and valleys. The mountain sides and valleys were then cut by glaciers during the Eocene and the three glaciation periods in the Quaternary Period. The current topography is the erosional remnant of the Oligocene-age San Juan volcanic field cut by glaciers.

### Surficial Soils:

The soils over the Properties include multiple units that are indicative of mountainous terrain. These soils include the Cryorthents-Rubble land complex consisting of well drained colluvium and slope alluvium derived from rhyolite with 30 percent to 75 percent slopes. Other soils include the Whitecross stony-rock outcrop complex units derived from volcanic rock and ash consisting of very stony sandy loam to extremely gravelly sandy loam and rubble consisting of fragmental materials with slopes between 15 percent to 75 percent.

### Hydrology:

The Properties are in the Dolores/San Juan River Basin that covers an approximate area of 10,169 square miles. The headwaters of both the San Juan and Dolores Rivers begin in the San Juan Mountains at an elevation between 13,000 feet and 14,000 feet, according to the Colorado Water Conservation Board (CWCB) and the Colorado Department of Water Resources (DWR). The San Juan River originates north of Pagosa Springs and flows southwest to an elevation of 4,800 feet before entering New Mexico, and then into Utah where it joins the Colorado River. The Dolores River is located north of the San Juan River and south of the Town of Telluride and flows southwest to McPhee Reservoir. The river then flows northwest to an elevation of 4,100 feet as it enters Utah where it joins the Colorado River.

Major tributaries to the San Juan River include the Navajo, Piedra, Los Pinos, Animas, Florida, La Plata, Rio Blanco, and Mancos Rivers, and McElmo Creek. Major tributaries to the Dolores River include the West Fork of the Dolores, the San Miguel Rivers, Lost Canyon, Disappointment, and West Paradox Creeks. Major reservoirs in the Dolores/San Juan Basin include the McPhee, Vallecito, Lemon, Cascade, Groundhog, and Narraguinnep Reservoirs.

Groundwater flow and depth under the Properties is highly variable due to the mountainous terrain. Groundwater flow and depth is influenced by subterrain pressures and bedrock fractures. Groundwater flows through the bedrock in these fractures.

### Flood Zones:

Flood zone maps have not been created for this area.

### Other:

Based upon the ERIS Physical Setting Report, no oil or gas wells have been constructed or permitted on the Properties or within a ½ mile radius. There are no oil and gas pit locations on the Properties or within ½ mile radius.

According to the ERIS Physical Setting Report, the Water Wells Permit Database lists 89 registered water wells constructed or permitted on either the Properties or within a ½ mile radius of the Properties. The United States Geological Society have 40 monitoring wells registered on or within ½ mile radius of the Properties.

## 2.5 Current Uses of Adjoining Properties

Direction from Subject Property	Current Use
North	Undeveloped mountainous terrain with remnants of former mining activities.
East	Undeveloped mountainous terrain with remnants of former mining activities.
South	Undeveloped mountainous terrain with remnants of former mining activities. San Juan County Road 2 running east and west along the Animas River to Silverton.
West	Undeveloped mountainous terrain with remnants of former mining activities. San Juan County Road 110 running north and south.

The Properties are located within the Bonita Peak Mining District Superfund site and the surrounding properties are part of the Superfund listings. Therefore, our observations of the adjoining properties reveal evidence of former mining activities and remedial efforts to stabilize and reclaim the former mining properties.

## 3.0 USER PROVIDED INFORMATION

IWC requested that a representative for the purchaser complete the User Questionnaire (Appendix F). On behalf of San Juan County Board of Commissioners, Anthony Edwards, BPMD Communications Liaison completed the questionnaire for the potential recipient of the Properties (User). The results of the questionnaire are summarized below:

User Provided Information	Issue Identified (Y/N)	Comments
Environmental Liens, Activity, or Use Limitations	Y	The area reviewed is included in a CERCLA designated site on the National Priority Listing. In addition, San Juan County is aware the property is subject to environmental covenants. In regards to local law, the property is subject to the institutional controls.
Engineered Controls	Y	San Juan County is aware of use limitations set forth in the institutional controls, land use restrictions and covenants required for property within designated Superfund Sites.
	N	

User Provided Information	Issue Identified (Y/N)	Comments
Specialized Knowledge of the User		
Valuation Reduction for Environmental Issues	Y	
Commonly Known or Reasonably Ascertainable Information	Y	San Juan County is aware of the documentation, research and sampling the Animas River Stakeholders, the State of Colorado, USGS, the Owner and EPA have gathered and/or prepared over the decades.
Obvious Indicators of Environmental Impact	Y	Yes, some areas within the property boundaries include the remnants of historic mining activity. In regards to the tailings ponds (1-4) those areas contain waste rock and other contamination based on historic activity.

### 3.1 Additional Information

Fire insurance maps were not created for this area.

## 4.0 RECORDS REVIEW

Regulatory database information from federal, state, and local environmental record sources was provided by ERIS. The purpose of the records review was to identify RECs in connection with the Properties.

Results of the database search in the ERIS Radius Report found 177 listings for the Properties and surrounding properties. Those identified listings are further discussed below within the applicable subsections. A copy of the database report is provided in Appendix G.

### 4.1 Regulatory Report Summary

Database	ASTM Type	Name	Company Site Name	Address	On Site	Facility Status	Comments
SUPER - FUND NRD	NPL EQUIV	Superfund National Priorities List and Natural Resource Damages sites	BONITA PEAK MINING DISTRICT	CO	Y		Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10119165	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	BLACK HAWK ET AL	SAN JUAN COUNTY	Y	Dep ID: 10107815	Considered a CREC in connection

Database	ASTM Type	Name	Company Site Name	Address	On Site	Facility Status	Comments
				SILVERTON CO 81433			with the Properties
MRDS	MINE	Mineral Resource Data System	AZTEC	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10167745	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	BARNES TUN	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10265002	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	TERRY TUNNEL	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10191718	Considered a CREC in connection with the Properties
PDES	NPDES	Permitted Facilities Listing	Terry Tunnel	CR 25 Silverton CO 81433	Y		Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	BEN FRANKLIN	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10018672	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	BEN FRANKLIN	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10143362	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	SUNNYSIDE	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10167210	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	LEAD CARBONATE	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10018661	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	GRIVITZA, MOUNTAIN EAGLE, NORMAN	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10108456	Considered a CREC in connection with the Properties
MRDS	MINE		GOLD KING	SAN JUAN COUNTY	Y		Considered a CREC in



Database	ASTM Type	Name	Company Site Name	Address	On Site	Facility Status	Comments
		Mineral Resource Data System		SILVERTON CO 81433		Dep ID: 10018670	connection with the Properties
MRDS	MINE	Mineral Resource Data System	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10288829	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	GEORGE WASHINGTON	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10264377	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	GEORGE WASHINGTON	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10018671	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	SILVER QUEEN MINE	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10107848	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	NATALIE	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10143070	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10289291	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	MINNEHAHA	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10143192	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	GRIVITZA, MOUNTAIN EAGLE	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10143319	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	KITTIMAC MINE	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10018545	Considered a CREC in connection with the Properties

Database	ASTM Type	Name	Company Site Name	Address	On Site	Facility Status	Comments
MRDS	MINE	Mineral Resource Data System	SILVER BAY MINE	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10009691	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	BLACK HAWK, OCCIDENTAL	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10107859	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	BLACK HAWK	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10018662	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	MINNEHAHA MINE	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10107856	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	MINNEHAHA MINE	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10018663	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	TREASURE MTN. GOLD MINING CO.	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10108249	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	PRIDE OF BONITA GROUP	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10018647	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	BURROWS - LITTLE IOLA	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10108450	Considered a CREC in connection with the Properties
PDES	NPDES	Permitted Facilities Listing	Sunnyside Basin	CR 9 Silverton CO 81433	Y		Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	GOLD PRINCE	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10289152	Considered a CREC in connection

Database	ASTM Type	Name	Company Site Name	Address	On Site	Facility Status	Comments
							with the Properties
MRDS	MINE	Mineral Resource Data System	NO NAME	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10167197	Considered a CREC in connection with the Properties
NPL	NPL	National Priority List	BONITA PEAK MINING DISTRICT; BONITA PEAK MINING DISTRICT	Multiple sources near Animas River headwaters; Multiple sources near AnimasRiver headwaters UNINCORPORATED CO 81433	Y	EPA ID: CON000802497	Considered a CREC in connection with the Properties
SEMS	NPL	SEMS List 8R Active Site Inventory	BONITA PEAK MINING DISTRICT	Multiple sources near Animas River headwaters UNINCORPORATED CO 81433	Y	EPA ID: CON000802497	Considered a CREC in connection with the Properties
FINDS/ FRS	SITE	Facility Registry Service/Facility Index	BONITA PEAK MINING DISTRICT	MULTIPLE SOURCES NEAR ANIMAS RIVER HEADWATERS UNINCORPORATED CO 81433	Y	Registry ID: 110070058573	Considered a CREC in connection with the Properties
SUPER-FUND ROD	NPL	Superfund Decision Documents	BONITA PEAK MINING DISTRICT	Multiple sources near Animas River headwaters UNINCORPORATED CO 81433	Y		Considered a CREC in connection with the Properties
FED INST	CONTROLS	Federal Institutional Controls- ICs	BONITA PEAK MINING DISTRICT	Multiple sources near Animas River headwaters UNINCORPORATED CO 81433	Y	EPA ID: CON000802497	Considered a CREC in connection with the Properties
FED ENG	CONTROLS	Federal Engineering Controls-ECs	BONITA PEAK MINING DISTRICT	Multiple sources near Animas River headwaters UNINCORPORATED CO 81433	Y	EPA ID: CON000802497	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	LEAD CARBONATE MINE	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10264986	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	BLACK HAWK	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10265018	Considered a CREC in connection

Database	ASTM Type	Name	Company Site Name	Address	On Site	Facility Status	Comments
							with the Properties
MRDS	MINE	Mineral Resource Data System	MIDWAY	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10167630	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	BENITOITE	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10119446	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	BELLE CREOLE	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10264607	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10167148	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	MOCKING BIRD	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10167595	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	WASHINGTON	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10216227	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	HIDDEN TREASURE	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10108457	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	HIDDEN TREASURE	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10240501	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	SILVER QUEEN	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10018674	Considered a CREC in connection with the Properties
MRDS	MINE			SAN JUAN COUNTY	Y		Considered a CREC in

Database	ASTM Type	Name	Company Site Name	Address	On Site	Facility Status	Comments
		Mineral Resource Data System	BLACK HAWK MINE	SILVERTON CO 81433		Dep ID: 10119261	connection with the Properties
MRDS	MINE	Mineral Resource Data System	MONTEZUMA NO. 1 AND PLAIN STREAK	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10018648	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	MAGNOLIA	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10018507	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	NATALIE	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10016737	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	SILVER LEDGE	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10108454	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	ROSS BASIN	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10289028	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	MASTODON	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10018673	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	MASTODON	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10118758	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	UNKNOWN GROUP	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10240592	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	SILVER QUEEN	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10018675	Considered a CREC in connection with the Properties

Database	ASTM Type	Name	Company Site Name	Address	On Site	Facility Status	Comments
MRDS	MINE	Mineral Resource Data System	GOLD PRINCE, MASTEDON	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10009757	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	SILVER QUEEN MINE	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10107900	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	GOLD PRINCE	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10281398	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	LEAD CARBONATE	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10240085	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	SILVER QUEEN LEAD ZINC GR	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10142879	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	PRIDE OF BONITA	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10107846	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	EAGLE MOUNTAIN	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10009762	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	ROSE	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10108299	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	GOLD KING	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10167198	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	GOLD KING	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10215736	Considered a CREC in connection



Database	ASTM Type	Name	Company Site Name	Address	On Site	Facility Status	Comments
							with the Properties
MRDS	MINE	Mineral Resource Data System	SILVER WING PROPERTY	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10018649	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	RANSOME LODGE	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10009487	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	INDEPENDENCE	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10264760	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	ADELPHIN	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10167141	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	SOUND DEMOCRAT	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10018556	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	SOUND DEMOCRAT	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10143010	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	GLADSTONE	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10142997	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	PLAIN STREAK	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10191688	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	RED AND BONITA	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10018669	Considered a CREC in connection with the Properties
MRDS	MINE		BISMARCK	SAN JUAN COUNTY	Y		Considered a CREC in

Database	ASTM Type	Name	Company Site Name	Address	On Site	Facility Status	Comments
		Mineral Resource Data System		SILVERTON CO 81433		Dep ID: 10018668	connection with the Properties
MRDS	MINE	Mineral Resource Data System	SILVER LEDGE	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10119122	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	MONTEZUMA #1	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10143533	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	SILVER QUEEN LEAD ZINC GROUP	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10108298	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10215720	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	RED & BONITA	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10264483	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	BIG COLORADO	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10240500	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	ADAMS	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10108455	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	EARLY BIRD	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10017829	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	ADAMS LODGE - BISMARCK	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10119011	Considered a CREC in connection with the Properties

Database	ASTM Type	Name	Company Site Name	Address	On Site	Facility Status	Comments
MRDS	MINE	Mineral Resource Data System	UNKNOWN GROUP	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10216117	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	MOUNTAIN QUEEN	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10119275	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	STANDARD MILL	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10240259	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	AMERICAN TUNNEL	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10265079	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	PRIDE OF BONITA	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10143474	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10118706	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	GOLD KING MILL PLACER	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10018664	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	PITTSBURGH	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10191550	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	BIG COLORADO	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10018659	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	GOLD THREAD	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10018660	Considered a CREC in connection with the Properties

Database	ASTM Type	Name	Company Site Name	Address	On Site	Facility Status	Comments
							with the Properties
MRDS	MINE	Mineral Resource Data System	BLACK DIAMOND	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10017770	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	EZRA R	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10119212	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	GOLD KING	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10017775	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	MOGUL	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10118864	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	EVENING STAR	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10167415	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	EVENING STAR	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10017769	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	QUEEN ANNE	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10017771	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	COLUMBIA	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10017776	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	COLUMBIA	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10264880	Considered a CREC in connection with the Properties
MRDS	MINE		CUSTER	SAN JUAN COUNTY	Y		Considered a CREC in

Database	ASTM Type	Name	Company Site Name	Address	On Site	Facility Status	Comments
		Mineral Resource Data System		SILVERTON CO 81433		Dep ID: 10289358	connection with the Properties
MRDS	MINE	Mineral Resource Data System	CUSTER	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10017768	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	QUEEN ANNE	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10142939	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	INDIAN CHIEF	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10119458	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10119404	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10158833	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	COMO CONSOLIDATED	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10191907	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	ENDLESS CHAIN	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10167378	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	AUBURN GROUP	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10167186	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	ROLLO	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10216484	Considered a CREC in connection with the Properties

Database	ASTM Type	Name	Company Site Name	Address	On Site	Facility Status	Comments
MRDS	MINE	Mineral Resource Data System	ROLLO	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10091010	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10191938	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	DAKOTA	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10018599	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	SILVER CHORD	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10240212	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	BELCHER	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10018641	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	BELCHER TUN NO.1	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10191916	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	BONANZA	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10240027	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	BONANZA	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10016736	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10215850	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	SEVEN-THIRTY	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10017789	Considered a CREC in connection



Database	ASTM Type	Name	Company Site Name	Address	On Site	Facility Status	Comments
							with the Properties
MRDS	MINE	Mineral Resource Data System	RED ROGERS	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10143492	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	RED ROGERS	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10017774	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10264862	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	SILVER CLOUD	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10018642	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	HESPERIAN	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10216263	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	SERRANO	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10143330	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	PICKET	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10118789	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	UNKNOWN GROUP	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10216002	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	BURROWS	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10018643	Considered a CREC in connection with the Properties
MRDS	MINE		EVENING STAR	SAN JUAN COUNTY	Y		Considered a CREC in

Database	ASTM Type	Name	Company Site Name	Address	On Site	Facility Status	Comments
		Mineral Resource Data System		SILVERTON CO 81433		Dep ID: 10167581	connection with the Properties
MRDS	MINE	Mineral Resource Data System	LITTLE IDA	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10119036	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	CALEDONIAN	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10017777	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	ACAPULCA	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10167815	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	ACAPULCA	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10018637	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	ALASKA	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10108449	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	VALLEY FORGE MINE	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10288746	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	OCCIDENT TUN	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10192209	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	STAR OF THE WEST	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10264573	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10192286	Considered a CREC in connection with the Properties

Database	ASTM Type	Name	Company Site Name	Address	On Site	Facility Status	Comments
MRDS	MINE	Mineral Resource Data System	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10191931	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	ALASKA	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10288721	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	SAXON	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10018639	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	MAXWELL	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10118765	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10288905	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10143041	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	MAYFLOWER MILL	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10288826	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10289254	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	VALLEY FORGE GROUP	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10018502	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	ASPEN MINE	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10215928	Considered a CREC in connection

Database	ASTM Type	Name	Company Site Name	Address	On Site	Facility Status	Comments
							with the Properties
MRDS	MINE	Mineral Resource Data System	ASPEN	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10108415	Considered a CREC in connection with the Properties
SWF/LF	SWFLF	Solid Waste Facilities and Landfills	CLOSED SILVERTON LANDFILL	APPROXIMATELY 1 MILE EAST OF TOWN SILVERTON CO	Y		Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10240506	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10281162	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	LACKAWANNA MINE	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10108414	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	LACKAWANNA MINE	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10118703	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	SILVERTON RESERVOIR BOG IRON DEPOSIT	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10018500	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	DORA	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10143211	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	LITTLE DORA	SAN JUAN COUNTY SILVERTON CO 81433	Y	Dep ID: 10018497	Considered a CREC in connection with the Properties
MRDS	MINE			SAN JUAN COUNTY	Y		Considered a CREC in

Database	ASTM Type	Name	Company Site Name	Address	On Site	Facility Status	Comments
		Mineral Resource Data System	CORNING WONDER MINE	SILVERTON CO 81433		Dep ID: 10108413	connection with the Properties
SWF/LF	SWFLF	Solid Waste Facilities and Landfills	NEW SILVERTON TRANSFER STATION	Silverton CO	N		Considered a CREC in connection with the Properties
CERCLIS	CERCLIS	Comprehensive Environmental Response, Compensation and Liability Information System - CERCLIS	RED AND BONITA MINE	COUNTY ROAD 52 SILVERTON CO 81433	N	Site EPA ID: CON000802811	Considered a CREC in connection with the Properties
CERCLIS	CERCLIS	Comprehensive Environmental Response, Compensation and Liability Information System - CERCLIS	MOGUL/ GRAND MOGUL MINE(S)	CEMENT CREEK SILVERTON CO 81433	N	Site EPA ID: CON000802803	Considered a CREC in connection with the Properties
BROWN -FIELDS	BROWN -FIELD	Brownfield Sites	Lackawanna Mill Site	468 County Road 20 Silverton CO 81433	N		Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	UNKNOWN	OURAY COUNTY OURAY CO 81427	N	Dep ID: 10143374	Considered a CREC in connection with the Properties
SUPER-FUND NRD	NPL EQUIV	Superfund National Priorities List and Natural Resource Damages sites	IDARADO MINE	TELLURIDE CO	N		Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	VERNON MINE	OURAY COUNTY OURAY CO 81427	N	Dep ID: 10215673	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	UNKNOWN	OURAY COUNTY OURAY CO 81427	N	Dep ID: 10287962	Considered a CREC in connection with the Properties

Database	ASTM Type	Name	Company Site Name	Address	On Site	Facility Status	Comments
MRDS	MINE	Mineral Resource Data System	UNKNOWN	OURAY COUNTY OURAY CO 81427	N	Dep ID: 10118530	Considered a CREC in connection with the Properties
MRDS	MINE	Mineral Resource Data System	UNKNOWN	OURAY COUNTY OURAY CO 81427	N	Dep ID: 10143073	Considered a CREC in connection with the Properties



## 4.2 Historical Resources Reviewed

IWC obtained historical sources from ERIS including oil and gas wells (Physical Settings Report - Appendix E), agency records (Database Report - Appendix G), aerial photographs (Aerial Photographs - Appendix H), topographic maps (Historical Topographic Maps - Appendix I), for the Properties and vicinity. Copies of these historical sources are provided in the identified appendices.

Historical Resource	Years Reviewed
Aerial Photographs	1945, 1951, 1960, 1972, 1975, 1986, 1988, 1998, 2005, 2009, 2011, 2013, 2015, 2017, 2019, 2021
Historical Topographic Maps	1897, 1901, 1902, 1955, 1972, 1975, 2001, 2013, 2016, 2019
Colorado Division of Oil and Public Safety	through October 2022
Colorado Department of Public Health and Environment	through October 2022
US Environmental Protection Agency	through October 2022

## 4.3 Historical Use Information on the Subject Property

### Historical Summary Table

Dates	Issue Identified?	Uses	Source(s)
1897	No	Mines and building structures are present. Early roadways and railroad tracks extending east along the Animas River from Silverton to Arrastre Creek are visible. Eureka townsite is present.	Topographic Maps
1901, 1902	No	Mines, building structures, and roadways are present. The Silverton and Northern Railroad tracks extend past Arrastre Creek to the Eureka Townsite.	Topographic Maps
1945, 1951, 1955	No	Mines, building structures, and roadways are present. The Silverton and Northern Railroad tracks are gone. The Eureka townsite is gone. The Mayflower Mill tailings ponds are present.	Aerial Photographs, Topographic Maps
1955, 1960, 1972, 1975	No	Mines and roadways are present and the road along Animas River is visible. San Juan County Road 2 crossing the southern Properties is further developed.	Aerial Photographs, Topographic Maps
1986, 1988, 1998	No	Significate develop of the Mayflower Mill tailing ponds. Fewer mining claims indicated.	Aerial Photographs, Topographic Maps
2001, 2003, 2005, 2009, 2011, 2013, 2015, 2016, 2017, 2019, 2021	No	The Properties appear relatively unchanged. Fewer mine symbols are illustrated on the topographic maps.	Aerial Photographs, Topographic Maps

#### 4.4 Historical Use Information on Adjacent Properties

##### Historical Summary North Adjacent Property

Dates	Issue Identified?	Uses	Source(s)
1897, 1901, 1902	No	Sunnyside Mine and Sunnyside Mill are present. Few mines, building structures, and roadways are visible.	Topographic Maps
1945, 1951, 1955, 1960, 1972, 1975,	No	Increased mining activity.	Aerial Photographs, Topographic Maps
1986, 1988, 1998	No	Mining activity appears stagnant.	Aerial Photographs, Topographic Maps
2013, 2015, 2016, 2017, 2019, 2021	No	Lake Emma is gone due to drainage into the American and Terry Tunnels. Mining activities appear to be nonexistent. Properties are undeveloped mountain terrain.	Aerial Photographs, Topographic Maps

##### Historical East Adjacent Property

Dates	Issue Identified?	Uses	Source(s)
1897, 1901, 1902	No	Few mines and building structures are present. Early roadways and the Eureka townsite is visible. Midway Mill located approximately one-mile east of Eureka is present.	Topographic Maps
1945, 1951, 1955, 1960, 1972, 1975	No	Increased mining activity. Eureka townsite and Midway Mill are gone.	Aerial Photographs, Topographic Maps
1986, 1988, 1998	No	Mining activity appears stagnant.	Aerial Photographs, Topographic Maps
2013, 2015, 2016, 2017, 2019, 2021	No	Mining activities appear to be nonexistent. Properties are undeveloped mountain terrain. The Eureka Campground is present in the former townsite.	Aerial Photographs, Topographic Maps

##### Historical South Adjacent Property

Dates	Issue Identified?	Uses	Source(s)
1897, 1901, 1902	No	Few mines and building structures are present. Early roadways and railroad tracks extending east along the Animas River from Silverton to Arrastre Creek are visible.	Topographic Maps
1945, 1951	No	Little mining activity and development.	Aerial Photographs, Topographic Maps
1955	No	An airstrip and a powerplant are present above and to the east of the town of Silverton.	Aerial Photographs, Topographic Maps

Dates	Issue Identified?	Uses	Source(s)
1960, 1972, 1975, 1986, 1988, 1998, 2013, 2015, 2016, 2017, 2019, 2021	No	Little to no development occurs during this time and the area remains relatively unchanged as undeveloped mountainous terrain.	Aerial Photographs, Topographic Maps

#### Historical West Adjacent Property

Dates	Issue Identified?	Uses	Source(s)
1897, 1901, 1902	No	Town of Silverton, few mines and building structures are present. Early roadways are visible.	Topographic Maps
1945, 1951, 1955, 1960, 1972, 1975	No	Increased mining activity.	Aerial Photographs, Topographic Maps
1986, 1988, 1998	No	Mining activity appears stagnant and the area remains relatively unchanged.	Aerial Photographs, Topographic Maps
2013, 2015, 2016, 2017, 2019, 2021	No	Mining activities appear to be nonexistent. Properties are undeveloped mountain terrain.	Aerial Photographs, Topographic Maps

#### 4.5 Data Failure/Data Gaps

Based on the definition presented in ASTM E2247-16, data failure occurs when all the standard historical sources that are reasonably-ascertainable and likely to be useful have been reviewed and the historical use of the Property has not been documented back to the Property's first developed use, or 1940, whichever is earlier. When data failure occurs, ASTM E2247-16 requires the Environmental Professional to document the data failure and assess the potential impact on the ability of the Environmental Professional to identify RECs.

IWC obtained historical use data of the Properties in accordance with ASTM E2247-16 and therefore no related data failure was identified.

No data gaps occurred during the performance of this ESA. This ESA was completed in accordance with ASTM E2247-16.

#### 5.0 SITE RECONNAISSANCE

Issue	Subject Property	Adjacent Properties
Hazardous Substances and Petroleum Products	No	No
Underground Storage Tanks	No	No
Aboveground Storage Tanks	No	No
Odors	No	No
Pools of Liquid	No	No

Issue	Subject Property	Adjacent Properties
Unidentified Substances	No	No
Drums	No	No
On-Site Chemicals	No	No
Hydraulic Oil	No	No
Polychlorinated Biphenyl's (PCBs)	No	No
Pits, Ponds, or Lagoons	Yes	Yes
Stained Soil or Pavement	No	No
Stains or Corrosion	No	No
Stressed Vegetation	No	No
Soil Waste	No	No
Transformers	No	No
Wastewater	No	No
Wells	No	No
Septic System	No	No
Drains and Sumps	No	No

John Trujillo Sr and John Trujillo Jr of IWC conducted the site reconnaissance from October 21 to October 23, 2022, to assess for the possible presence of petroleum products and hazardous materials at the Properties. Prior to performing the field inspections, IWC personnel met with Mr. Anthony Edwards, liaison for San Juan County to discuss aspects of the Properties. The weather at the time of site reconnaissance was clear and approximately 30-45 degrees Fahrenheit. IWC personnel drove, walked, and observed the Properties and the surrounding properties.

Many of the Properties were discovery diggings where in order to establish a mining claim the property was developed with shallow digging. Other Properties that had been mined for ore appeared to be remediated by relocation and stabilization of the mine tailings. Engineered water collection and settlement ponds were constructed in areas where mine water was discharging. There are areas of scattered debris that were from the former mining and historic development activities. Remnants are present on Parcel 47750140050002 of the former boiler house used in the operation of the tramway, wood and metal debris, concrete tramway foundation, and a powder magazine cut into the mountain side that was used for the storage of explosives during active mining. Due to the inaccessibility of some of the parcels, physical inspections were not possible, however, these parcels were observed for meaningful mine workings using telescopic visualizations. Photographs of the Properties are included in Appendix J.

## 6.0 INTERVIEWS

Title	Name	Comments
Vice President, Kinross Gold USA	Dennis McHarness	October 6, 2022: SGC operated the Sunnyside Mine and Properties of this ESA from 1985 to 1991 and acquired ownership in 1992. All mining operations ceased in 1991. SGC entered into a Consent Decree with the CWQCD in 1996 and the EPA in August 2015. Since this time, remedial investigations and corrective actions have been completed. SGC was released from environmental responsibility by the EPA in April 2022. Mr. McHarness provided Acreage Reduction Approval letters issued by the Colorado Division of Minerals and Geology, Permit to Discharge termination letters issued by the CDPHE, and Financial and Performance Warranty Release Approvals issued by the Colorado Division of Mining and Safety. These documents are provided in Appendix K.
San Juan County Liaison - User	Anthony Edwards	October 21, 2022: Mr. Edwards has been the liaison for San Juan County since August 2015. He is familiar with legal and environmental issues associated with the BPMD. Mr. Edwards completed the User Questionnaire on behalf of San Juan County.
Colorado Department of Public Health and Environment	Mark Rudolph	October 13, 26, 2022: The SGC mining parcels have been investigated and remediated to the satisfaction of the EPA. The SGC portals and adits have been closed or safety secured in accordance with the Colorado Division of Reclamation, Mining and Safety regulations. Active and pending remediation is on-going at the Terry Tunnel and the Mayflower Mill tailings ponds. The EPA and CDPHE are working on a remedial investigation and feasibility study for management of the groundwater. Activity on these area will be on-going for over 10 years. SGC was release of environmental liability in 2022 on these Properties. He has not observed fuel storage tanks or other potential hazardous conditions on the SGC Properties.

## 7.0 EVALUATION

IWC has performed a Phase I ESA in conformance with the scope and limitations of ASTM Standard Practice E2247-16 of the former mining properties owned by SGC and located in San Juan County Mining Claim Parcels, Silverton, Colorado, 81433.

This Phase I ESA revealed that the Properties are located entirely in a EPA Superfund designated area. Based on aerial photographs, topographic maps, regulatory agency records, the San Juan County Assessor, and on-site observations, the Properties are former mining claim parcels. Mining began in San Juan County in the 1870's and ended in 1991 when the last producing mine ceased production. These accumulated mining activities resulted in contamination from heavy metals and sediments that impacted the soil, groundwater, and surface water over three drainages in the watershed. Over 400 abandoned or inactive mines are present

in these three drainages. Due to this contamination, the EPA listed the area as the Bonita Peak Mining District Superfund site and added it to the National Priorities List on September 9, 2016.

Environmental investigations and remedial actions have been performed by SGC and the EPA to reduce or eliminate loading to the waterways by metals mine disturbance sediments. Based upon the San Juan County Assessor's Property and Map Search website on October 20, 2022, and a interview with CDPHE, the SGC Properties have been remediated to the extent required by the regulations of the Bonita Peak Mining District Superfund. While these Properties have been remediated to the extent required by regulation for the Superfund listing, the Properties have not been remediated for unrestricted use. Therefore, the Superfund listing is considered a CREC in connection with the Properties.

This Phase I ESA did not reveal evidence of RECs in connection with the Properties. Water drainage from Terry Tunnel, the Mayflower Mill Tailing ponds, and groundwater impacted with metals are environmental concerns in connection with the Properties that are being addressed by the EPA.

This Phase I ESA did not reveal evidence of HRECs in connection with the Properties. While regulatory closure was issued on the Properties, these closures are based upon the Superfund regulatory requirements and not for unrestricted use.

According to ASTM E2600-15 and based upon the absence of known or reported hazardous chemicals or volatile organic compounds released to the Properties or immediate surrounding area, a vapor encroachment condition can be ruled out.

## **8.0 ENVIRONMENTAL PROFESSIONAL'S STATEMENT**

I declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in §312.10 of 40 CFR Part 312. I have the specific qualifications based on education, training, and experience to assess a property. I have developed and performed all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312. Qualifications for the Environmental Professional are included in Appendix L.

## 9.0 REFERENCES

American Society for Testing and Materials (ASTM), Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process for Forestland or Rural Property, ASTM Designation: E2247-16.

ASTM, Standard Guide for Vapor Encroachment Screening on Property Involved in Real Estate Transactions, ASTM Designation: E2600-15.

Colorado Department of Public Health and Environment: Online records review, October 2022.

Colorado Division of Water Resources: Online well permit search, October 27, 2022.

Colorado Department of Labor and Employment-Division of Oil and Public Safety: Online records search, October 27, 2022.

ERIS, 2520 South Interstate Highway 35, Suite 200 Austin, Texas, (512) 823-0217: Database Report dated, October 12, 2022.

ERIS, 2520 South Interstate Highway 35, Suite 200 Austin, Texas, (512) 823-0217: Physical Settings Maps, Oil and Gas Report, Water Well Report, October 11, 2022.

San Juan County Board of Commissioners: Ordinance No. 2020-01, December 15, 2020.

San Juan County Assessors: Property and Map Search, October 2022.

United States District Court for the District of New Mexico: Consent Decree, August 5, 2015.

United States District Court for the District of New Mexico: Consent Decree, April 29, 2022.

United States Environmental Protection Agency (EPA):

- Unilateral Administrative Order for Remedial Investigation, March 15, 2010.
- Interim Record of Decision, Bonita Peak Mining District Superfund Operable Unit 1, May 20, 2019.
- Adaptive Management Site Management Plan for the Bonita Peak Mining District, November 2020.

United States Geological Survey 7.5 & 15 Minute Series Topographic Maps;

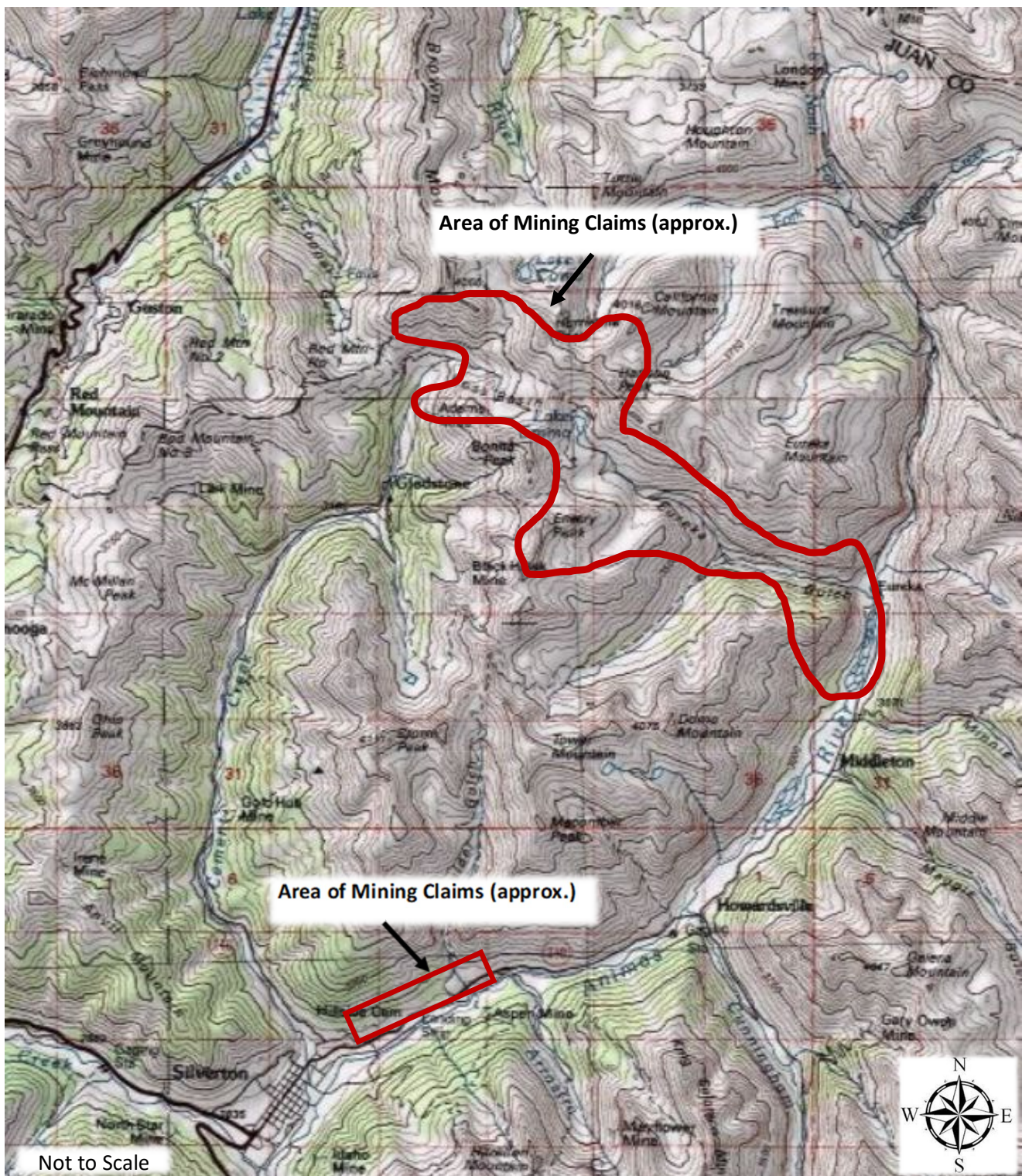
- Silverton, CO 1897, 1901, 1902, 1955, 1972, 1975, 2001, 2013, 2016, 2019
- Handies Peak, CO, Ironton, CO, Howardsville, CO 1955, 1972, 1975, 2001, 2013, 2016, 2019.

## Appendix A

### Figure 1

#### Site Location/Topographic Map



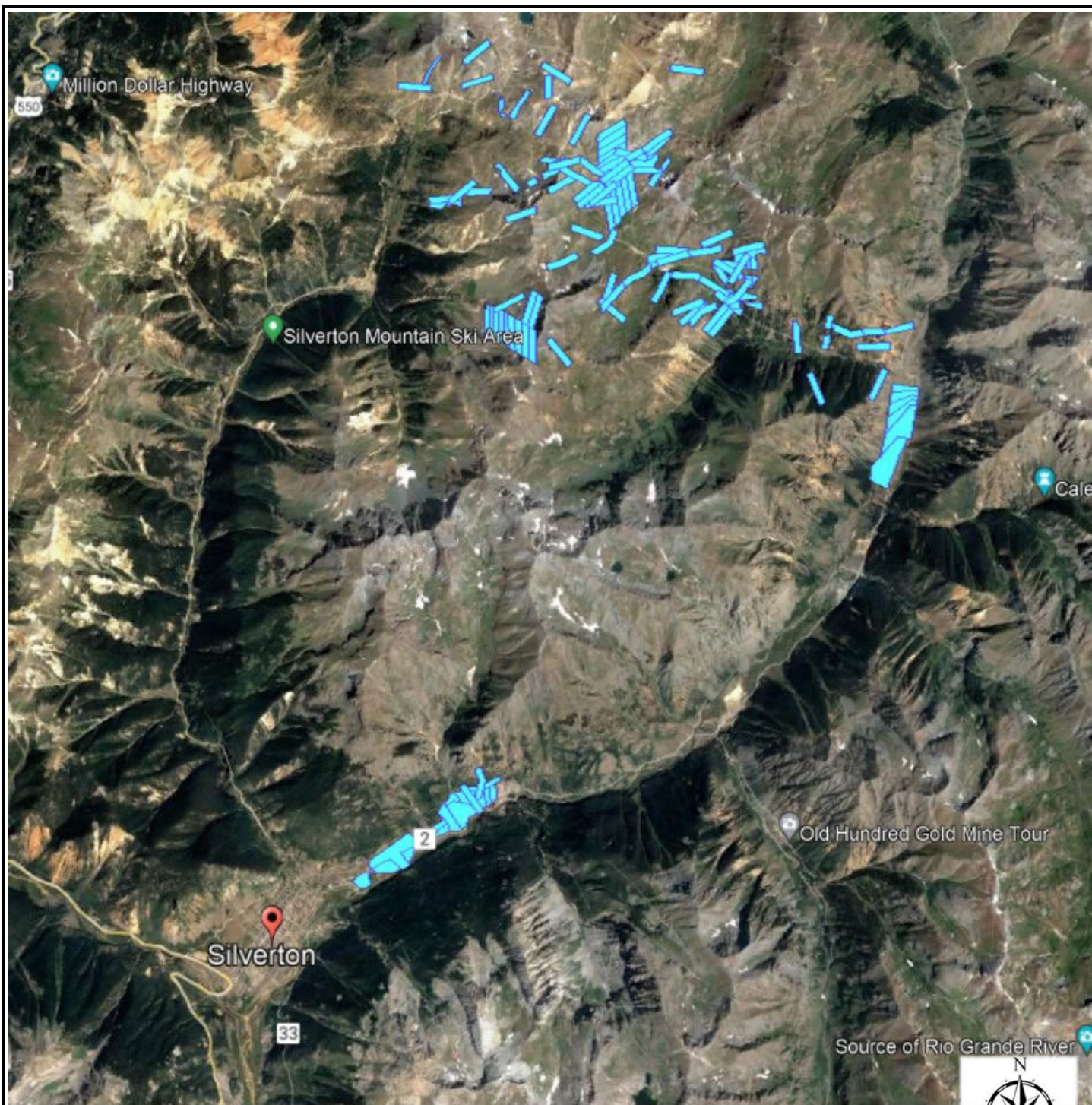


**Site Location/Topographic Map**  
Sunnyside Gold Corporation Mining Claims  
San Juan County, Colorado

**FIGURE No. 1**

Figure 2  
Site Detail





Not to Scale



**Site Detail Map**  
Sunnyside Gold Corporation Mining Claims  
San Juan County, Colorado

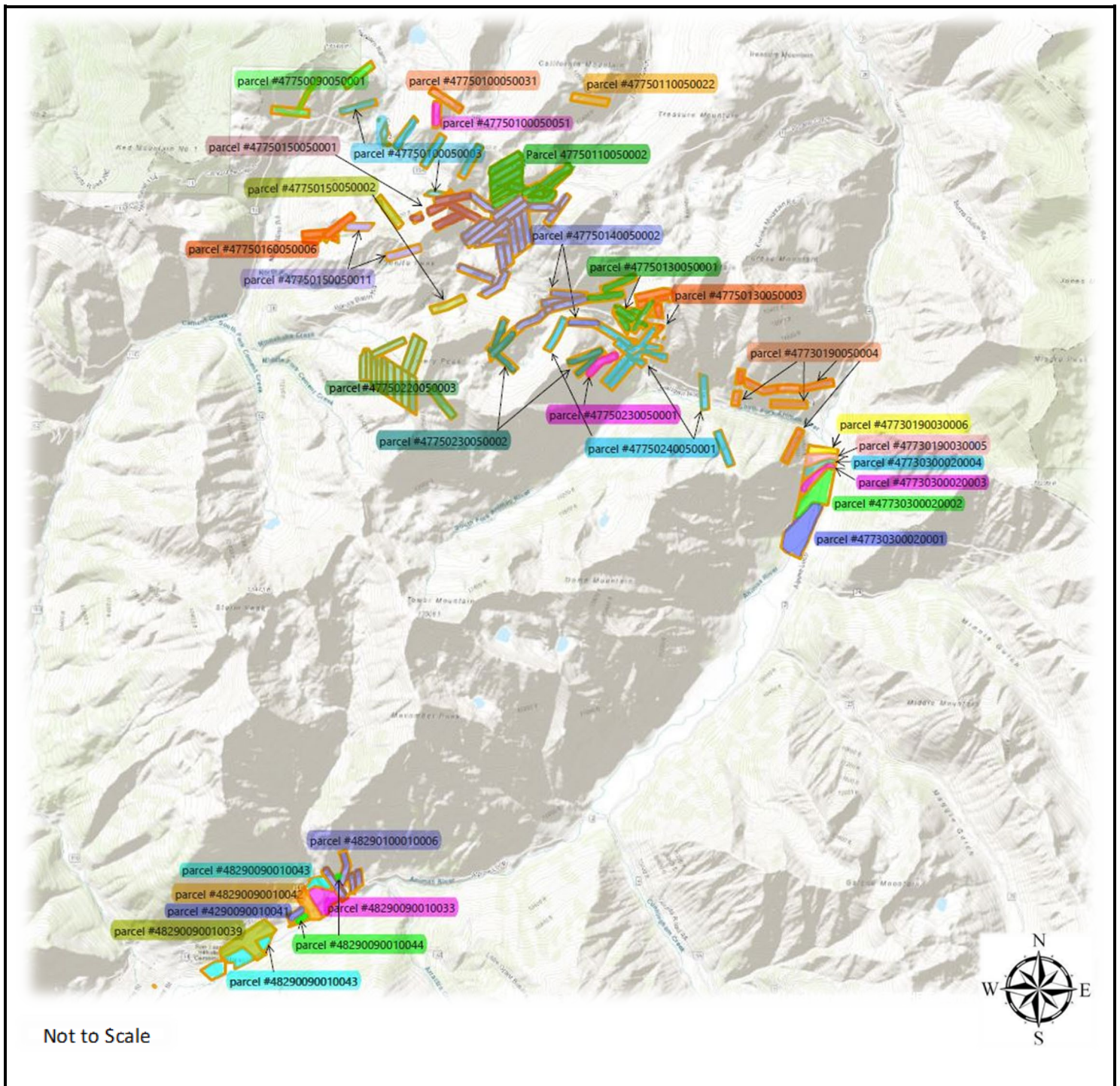
 Subject Mine Claim

**FIGURE No. 2**

# Figure 3

## Parcel Map





**Parcel Map**  
 Sunnyside Gold Corporation Mining Claims  
 San Juan County, Colorado

**FIGURE No. 3**

# Appendix B

## Mining Parcel List

## Exhibit A

The Following Properties are Located in Township 42 North, Range 6 West,  
Township 42 North, Range 7 West, and Township 41 North, Range 7 West, N.M.P.M.

Property Tax Parcel ID	Description/Claim Name and Mineral Survey No.
#47730190030005	EUREKA TOWNSITE LOT 5 ACCORDING TO THE RECORDED BOUNDARY ADJUSTMENT THEREOF FILED FOR RECORD SEPTEMBER 30, 2011 AS RECEPTION #148168
#47730190030006	EUREKA TOWNSITE LOT 6 ACCORDING TO THE RECORDED BOUNDARY ADJUSTMENT THEREOF FILED FOR RECORD SEPTEMBER 30, 2011 AS RECEPTION #148168
#47730190050004	CASHIER LODGE - MS 134 (UND 9/10 INT IN 10.5 ACRES), CENTENNIAL - MS 16635, NASBY - MS 2508, ROVING RANGER LODGE - MS 151 A, TAGNER - MS 16804, WHITE STAR - MS 14368
#47730300020001	EUREKA TOWNSITE LOT 1 ACCORDING TO THE RECORDED BOUNDARY ADJUSTMENT THEREOF FILED FOR RECORD SEPTEMBER 30, 2011 AS RECEPTION #148168
#47730300020002	EUREKA TOWNSITE LOT 2 ACCORDING TO THE RECORDED BOUNDARY ADJUSTMENT THEREOF FILED FOR RECORD SEPTEMBER 30, 2011 AS RECEPTION #148168
#47730300020003	EUREKA TOWNSITE LOT 3 ACCORDING TO THE RECORDED BOUNDARY ADJUSTMENT THEREOF FILED FOR RECORD SEPTEMBER 30, 2011 #148168
#47730300020004	EUREKA TOWNSITE LOT 4 ACCORDING TO THE RECORDED BOUNDARY ADJUSTMENT THEREOF FILED FOR RECORD SEPTEMBER 30, 2011 #148168
#47750090050001	CASHIER - MS 442, ORIENTAL - MS 566, PRIDE OF THE ALPS - MS 572
#47750100050003	EMMA - MS 2273, LULU CARROLL - MS 873, MOTHER GOOSE - MS 17234, MOULTRIE LODGE - MS 173, PAYMASTER - MS 1301, PONY - MS 2336 (UND 2/3 INT IN 8.10 ACRES)
#47750100050031	MIDNIGHT - MS 5616
#47750100050051	TAGGART - MS 2338 (UND 1/3 INT IN 7.22 ACRES)

#47750110050002	PALOS - MS 18732, PALOS #1 - MS 18732, PALOS #2 - MS 18732, SUNNYSIDE #2 - MS 20003, SUNNYSIDE EXT - MS 1180, TERRY - MS 17986, MASTODON - MS 216, NO NAME - MS 2272, CROWN JEWEL - MS 20003, DOCTOR - MS 2093 A, ESMERALDA - MS 16165, GOLD PRINCE - MS 20003
#47750110050022	FEARLESS - MS 17011
#47750130050001	MUSKEGON - MS 1394, RARUS - MS 1401, NANTUCKET - MS 6954 (UND 5/12 INT IN 10.28 ACRES), DENVER - MS 1403, ALMA - MS 1708, CHARLTON - MS 1706
#47750130050003	CLIMAX #3 - MS 19474, TIP TOP - MS 18108, TIP TOP #2 - MS 19474, TIP TOP #3 - MS 19474
#47750140050002	REPUBLIC - MS 12724, RUBY - MS 18020, SHOSHONE - MS 17201, SILVER BOW - MS 18020, SUNNYSIDE - MS 438, SUNNYSIDE ANNEX - MS 16668, THUNDERBERG - MS 1395, WEDGE - MS 18160, ANACONDA - MS 18020, BAVARIAN - MS 1396, BRIGGS - MS 8400, BUTTE CITY - MS 18020, CLIMAX - MS 12723, CLIPPER - MS 1689, HERMAN - MS 1397, HIDDEN TREASURE EXT - MS 20003, LAKE - MS 2027, LAST CHANCE - MS 17901, LITTLE MARY - MS 2038, METROPOLIS - MS 1398, PEARL - MS 5975, QUAIL - MS 20003, RAYMOND - MS 18020
#47750150050001	GEORGE WASHINGTON - MS 2028, GRAND VIEW - MS 17202, MOUNTAIN SHEEP - MS 17432, OREGON - MS 17233
#47750150050002	HONECK - MS 16200, SILVER KING - MS 1857
#47750150050011	PAYMASTER - MS 18080, WATERLOO - MS 17429
#47750160050006	EMMA #1 - MS 17538, EMMA #2 - MS 17538, SMUGGLER - MS 1758
#47750220050003	AMA - MS 18849, BLUFF HILL - MS 18849, DOVER - MS 1690, GOLD PEAK - MS 16393, JOE - MS 18849, MILANO - MS 16393, RED - MS 18849, ROCK - MS 18849, ROSA - MS 18849, ROSSO - MS 18849, ROUENA O - MS 16393, TREASURE - MS 18849, YANKEE BOY - MS 18849
#47750230050001	BEAUBREC - MS 1709
#47750230050002	A D SEARL - MS 1714, DANEBURG - MS 1780, HILDERBRAND - MS 1707, KNICKERBOCKER - MS 1717, UNDERWOOD - MS 1719



#47750240050001	BLUCHER - MS 1400, EIGHTY NINE - MS 16997, ESTEY - MS 13189, LIZZIE NORRIS - MS 1702, GRAND - MS 2573, GRAND PRIZE - MS 1701, GREAT EASTERN - MS 1691, NEW YORK - MS 8399, WELLINGTON - MS 16997, SUNBEAM - MS 1419
#48290090010033	BEND PLACER - MS 11596, C H MILL SITE - MS 20594. FORMERLY PART OF SCHEDULE 48290090010031
#48290090010039	SUNNYSIDE GOLD CORPORATION - PERINO BOUNDARY ADJUSTMENT PARCEL C, RECORDED AS RECEPTION NO. 151146, IN SUSPENDED T41N R7W. FORMERLY PART OF ANN HARRIS PLACER - MS 11596 AND FORMER PARCEL BB, RECORDED AS RECEPTION NO. 186140. FORMERLY PART OF SCHEDULES 48290090010003 AND 48290090010036.
#48290090010041	SUNNYSIDE GOLD CORPORATION - PERINO BOUNDARY ADJUSTMENT PARCEL E, RECORDED AS RECEPTION NO. 151146, IN SUSPENDED T41N R7W. FORMERLY PORTIONS OF M D THATCHER - MS 17699 AND POLAR STAR MILL SITE - MS 7608. FORMERLY PART OF SCHEDULE 48290090010031 AND 48290090010032.
#48290090010042	SUNNYSIDE GOLD CORPORATION - PERINO BOUNDARY ADJUSTMENT PACEL F, RECORDED AS RECEPTION NO. 151146, IN SUSPENDED T41N R7W. FORMERLY PART OF PETER PLACER - MS 11596, AND SMALL PORTIONS OF M D THATCHER - MS 17699 AND BLM TRACT 41. FORMERLY PART OF SCHEDULE 48290090010031 AND 48290090010032.
#48290090010043	BLAIR PLACER - MS 841, GOLD -MS 14012, JEANNETTE ROUX PLACER MS 11596 MINERAL RIGHTS ONLY, RIVERSIDE (PART) - MS 8801, H V B MILL SITE - MS 20594 B. FORMERLY PART OF SCHEDULE 48290090010003
#48290090010044	TRACTS 42, 43, 44, 45, AND PARCEL DD IN T41N R7W
#48290100010006	BUENA VISTA - MS 14012, M B MILLSITE - MS 20595 B, N N MILLSITE - MS 20595 B, T H W M S TRACT A - MS 20595 B, T H W M S TRACT B - MS 20595 B

# Appendix C

## Regulatory Filings

DISTRICT COURT, CITY AND COUNTY OF DENVER, STATE OF COLORADO

Case No. 94 CV 5459 Courtroom 7

**CONSENT DECREE AND ORDER**

RECEIVED

MAY 08 1996

SUNNYSIDE GOLD CORPORATION,

Plaintiff,

OFFICE OF THE  
ATTORNEY GENERAL  
NATURAL RESOURCES SECTION

v.

COLORADO WATER QUALITY CONTROL DIVISION OF THE COLORADO  
DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT,

Defendant.

**RECITALS**

WHEREAS, Sunnyside Gold Corporation ("SGC"), a subsidiary of Echo Bay Inc., is a corporation duly organized and existing under the laws of the State of Delaware and having its principal place of business in San Juan County, Colorado.

WHEREAS, the Colorado Water Quality Control Division ("Division") is an agency of the State of Colorado duly created pursuant to section 25-8-301 of the Colorado Revised Statutes (1988) as part of the Division of Administration, Colorado Department of Public Health and Environment. The Division's duties include the administration and enforcement of the water quality control program adopted pursuant to the Water Quality Control Act, C.R.S. § 25-8-101 (1989) ("Act").

WHEREAS, SGC owns an inactive mining property in San Juan County, Colorado, near the City of Silverton, commonly referred to as the Sunnyside Mine ("Mine").

WHEREAS, SGC undertook mining operations at the Mine for approximately six years, from 1985 to 1991, although the Mine has operated under other owners for many decades.

WHEREAS, SGC holds two Colorado Discharge Permit System ("CDPS") permits authorizing the discharge of pollutants from the mine, in accordance with numeric effluent limits and other conditions. CDPS Permit No. CO-0027529 authorizes the discharge of Mine water through the Mine's main access portal, commonly referred to as the American Tunnel, to Cement Creek. SGC does not own all of the property drained by the American Tunnel. CDPS Permit No. CO-0036056 authorizes the discharge of Mine water through a secondary access portal, commonly referred to as the Terry Tunnel, to Eureka Gulch. SGC continues to be bound by the terms and conditions of its CDPS permits and continues to treat Mine water flows. Treatment includes creation of treatment residues which are periodically dredged and disposed of at SGC's existing tailings pond.

WHEREAS, SGC holds CDPS Permit No. CO-0000426, for the Mayflower Mill, which authorizes the discharge of pollutants from the Mayflower Mill tailings piles to the Animas River in accordance with numeric effluent limits and other conditions.

WHEREAS, SGC also holds the following CDPS stormwater permits:

(1) COR-040052 - American Tunnel Stormwater: authorizes discharges composed entirely of stormwater from the site to Cement Creek in accordance with the site Stormwater Management Plan ("SWMP").

(2) COR-040053 - Ross Basin-Brenneman Vein Project Stormwater: authorizes discharges composed entirely of stormwater from the site to Cement Creek in accordance with the site SWMP.

(3) COR-040054 - Mayflower Mill Stormwater: authorizes discharges composed entirely of stormwater from the site to the Animas River in accordance with the site SWMP.

(4) COR-040055 - Eureka Millsite Stormwater: authorizes discharges composed entirely of stormwater from the site to the Animas River in accordance with the site SWMP.

(5) COR-040056 - Midway Millsite Stormwater: authorizes discharges composed entirely of stormwater from the site to the South Fork of the Animas River in accordance with the site SWMP.

(6) COR-040057 - Ransom-White Star Tunnel Stormwater: authorizes discharges composed entirely of stormwater from the site to the South Fork of the Animas River in accordance with the site SWMP.

(7) COR-040058 - Terry Tunnel Stormwater: authorizes discharges composed entirely of stormwater from the site to Eureka Creek in accordance with the site SWMP.

(8) COR-040059 - Mayflower Mine Stormwater: authorizes discharges composed entirely of stormwater from the site to Arrastra Creek in accordance with the site SWMP.

(9) COR-040060 - Sunnyside Basin Stormwater: authorizes discharges composed entirely of stormwater from the site to Eureka Creek in accordance with the site SWMP.

(10) COR-040061 - Gold Prince Mine Stormwater: authorizes discharges composed entirely of stormwater from the site to Placer Gulch in accordance with the site SWMP.

(11) COR-040063 - Gold Prince Mill Stormwater: authorizes discharges composed entirely of stormwater from the site to the Animas River in accordance with the site SWMP.

WHEREAS, SGC also holds Mined Land Reclamation Permit No. M77-378 ("MLR Permit") pursuant to the Colorado Mined Land Reclamation Act, C.R.S. § 34-32-101 (1995) ("MLRA").

WHEREAS, Pursuant to the MLRA and MLR Permit, SGC has been in the process of final reclamation of the Mine, the Mayflower Mill, and the tailings impoundments at the Mayflower Mill for several years. The final reclamation plan (the "Reclamation Plan"), submitted by SGC to and approved by the Colorado Mined Land Reclamation Board, includes installation by SGC of a bulkhead at SGC's underground property line within the American Tunnel to prevent mine water from flowing directly out of the Mine workings through the American Tunnel portal to Cement Creek and installation by SGC of a bulkhead at the Terry Tunnel portal.

WHEREAS, the Division of Minerals and Geology ("DMG") recommended, and the Mined Land Reclamation Board approved, a technical revision to SGC's Reclamation Plan on November 18, 1993, specifying the details and conditions for the installation of the underground bulkheads.

WHEREAS, DMG's approval included in its rationale that indefinite or perpetual mine drainage treatment was not desirable for final reclamation and that hydraulic seals offer the best alternative for final mine site reclamation. The DMG approval rationale also stated that the physical setting of the Sunnyside Mine appeared to be ideal for a hydraulic sealing scheme.

WHEREAS, the Mined Land Reclamation Board's ("MLRB") approval of the technical revision specifically noted the disagreement between the WQCD and SGC regarding SGC's legal responsibility for CDPS permitting of seeps and springs after the sealing of the mine workings. The MLRB required that any measurable change in water quality or quantity in the seeps and springs of the drainages surrounding the Mine be monitored and reported to DMG and to the WQCD, required that SGC contact the WQCD in the event of any such measurable change to determine if a new or existing discharge permit for the Mine is necessary, and stated that responsibility for enforcement of potential discharge permit compliance problems would rest with the WQCD.

WHEREAS, since the American Tunnel was extended to the Sunnyside Mine workings in the 1950's, and today, most water in and nearby the mine area has flowed in part out of the ground through naturally occurring seeps and springs and has flowed in part through the Mine workings and American Tunnel to Cement Creek. Water has also historically drained through the Terry Tunnel to Eureka Gulch. Since at least 1985, flows from the American and Terry Tunnels have been treated at treatment plants prior to discharge in accordance with CDPS permits.

WHEREAS, installation of these bulkhead seals will impound water behind the bulkheads, eventually flooding the Mine, and at some time subsequent to initial Mine flooding, water, which is now discharged through the American Tunnel and Terry Tunnel portals pursuant to the CDPS Permits, may flow through underground fractures and fault systems which may form seeps and springs which discharge into surface waters.

WHEREAS, the Parties dispute whether or not the seeps and springs which may emerge or increase following installation of bulkhead seals in the American and Terry Tunnels would be subject to the permit requirements of the Act. The Division's position is that any such seeps or springs could be enforceable against SGC as violations of the Act as the discharge of pollutants to state waters from a point source without a permit. SGC's position is that any such seeps and springs would not be subject to the permit requirements of the Act because they would not constitute the discharge of pollutants by SGC from a point source.

WHEREAS, SGC filed a Complaint for Declaratory Relief in this case against the Division requesting that the Court determine the applicability of the permit requirements of the Act so that final reclamation could proceed.

WHEREAS, the Parties desire that reclamation of the Mine proceed to completion.

WHEREAS, SGC desires termination of CDPS Permits No. CO-0027529 and CO-0036056.

WHEREAS, to resolve this dispute, to allow SGC to proceed with final reclamation of the Sunnyside Mine, to provide for closure of the American and Terry Tunnels by hydraulic seals, to provide for mitigation of certain other historic mining conditions, to protect the



waters of the State of Colorado, and to provide for the final termination of CDPS Permits No. CO-0027529 and CO-0036056, the parties agree to the terms and conditions of this Consent Decree. For purposes of settlement, they do so without trial of any facts or legal issues. Except as set forth in this Consent Decree, the parties neither admit nor deny any factual allegations related to the closure of the American and Terry Tunnels; nor do the parties concede any disputed legal issues which have been or could have been raised in this litigation.

WHEREAS, the Parties agree that the terms, conditions, and undertakings herein will create mutual contractual rights and obligations between the Parties.

WHEREAS, the Parties consent and agree to the entry by this Court of this Consent Decree and Order.

NOW THEREFORE IT IS HEREBY ORDERED, ADJUDGED AND DECREED AS FOLLOWS:

#### **I. JURISDICTION**

1. This Court has jurisdiction over the Parties and the subject matter of this action and decree.

#### **II. PARTIES BOUND AND FINDINGS**

2. Upon entry, this Consent Decree will apply to and be binding upon each of the Parties, and upon any successors in interest and assigns. The undersigned representatives of the respective Parties certify that they are fully authorized by the Party whom they represent to

enter into the terms and conditions of this Consent Decree, to execute this Consent Decree, and to legally bind that Party to the terms and conditions of this Consent Decree.

3. The Parties agree, and the Court finds, that the settlement embodied in this Consent Decree is lawful under the Act, is consistent with the purposes of the Act, and is intended to protect the waters of the State of Colorado.

### **III. DEFINITIONS**

4. Words used in this Consent Decree that are defined in the Colorado Water Quality Control Act, C.R.S. § 25-8-101 ("Act") or regulations promulgated pursuant to the Act ("regulations") are defined, for purposes of this Consent Decree, as defined in the Act and regulations. Other words used in this Consent Decree are to be taken and understood in their ordinary sense unless this Consent Decree indicates that a different meaning was intended. Whenever the following terms are used in this Consent Decree, together with all documents appended hereto, the following meanings apply:

a. "Consent Decree" means this document when entered by the Court and in effect, all appendices attached hereto, and any future amendments hereto.

b. "Division" means the Water Quality Control Division of the Colorado Department of Public Health and Environment.

c. "DMG" means the Division of Minerals and Geology of the Colorado Department of Natural Resources.

d. "Field Season" means any annual construction season so long as the Consent Decree has been entered by the Court prior to June 1 of that calendar year.

e. "Parties" collectively means the Water Quality Control Division of the Colorado Department of Public Health and Environment and Sunnyside Gold Corporation.

"Party" means either of the Parties.

f. "Mitigation Project Site" means any one of the locations for the mitigation projects described in Appendix B, which includes "A" list and "B" list projects and any additional mitigation projects agreed to by the Parties pursuant to this Consent Decree.

g. "Reclamation Standards" for purposes of the mitigation projects, means sections 3.1.5 (materials handling), 3.1.9 (top soiling), 3.1.10 (revegetation), and 3.1.11 (buildings and structures) of the rules of the Mined Land Reclamation Board, 2 CCR 407-1 as they exist at the time this Consent Decree is entered by the Court.

h. "Reference Point" means the water quality monitoring station A-72 located on the Animas River, below its confluence with Mineral Creek, below Silverton, Colorado. It is also known as USGS Gage Site No. 09359020 and as the Water Quality Control Division's River Pollution System ("RPS") No. 82. The function of the Reference Point under this Consent Decree is described in paragraph 14 and in Appendix A attached hereto.

i. "Reference Water Quality" is defined as it is in Appendix A.

j. "SGC" means Sunnyside Gold Corporation.

k. "Work" means all remedial, mitigative, corrective, and other actions, schedules, plans, terms, and conditions prescribed by or described in this Consent Decree, documents appended hereto, and any future amendments hereto.

l. "Work Plan" means any one of the plans for remedial or mitigative work, either attached to the permit for mitigation projects which is attached as Appendix C to this Consent Decree, or submitted by SGC to the Division for approval pursuant to this Consent Decree.

m. "WQCD" means the Water Quality Control Division of the Colorado Department of Public Health and Environment.

#### IV. COMMITMENTS OF THE PARTIES

5. Performance and Financing of the Work. SGC will perform, or cause to be performed, the Work agreed to in this Consent Decree. SGC may undertake any portion of the Work through qualified consultants or contractors designated by SGC, provided that no such designation will relieve SGC of any of its obligations under this Consent Decree. SGC will timely finance the Work. SGC will complete the Work in accordance with the Reclamation Standards of the Colorado Division of Minerals and Geology ("DMG") and the Work Plans.

a. SGC will reimburse to the State of Colorado the actual costs for time spent for inspection of the Work performed pursuant to the Consent Decree at a rate of \$33.33 per hour, and associated expenses, up to a maximum of \$3,100 per mitigation project. SGC

will pay the amounts billed to it within thirty (30) days of receipt of those bills, as directed by the Division.

6. Maintaining Water Quality. SGC will carry out the Work required under this Consent Decree in a manner which is intended to maintain water quality in the Animas River at the Reference Point, as set forth in Appendix A hereto. SGC will monitor water quality at the Reference Point as required in paragraph 10 and statistically compare analytical results to the Reference Water Quality using the methodology set forth in Appendix A. SGC will respond to a statistically identified deterioration in water quality at the Reference Point as set forth in Appendix A. The Reference Point will not be a permit compliance point.

7. Monitoring and Completion. SGC will perform the monitoring described in paragraph 10, and, unless this Consent Decree is prematurely terminated, will certify that it has fulfilled the criteria for completion set forth in paragraph 14.

8. State Oversight and Obligations. The Division will at any time have the right to inspect any Work required of SGC under this Consent Decree and, upon request by SGC, the Division will request that DMG inspect any of the mitigation projects to determine whether the reclamation Work has been completed in accordance with the Reclamation Standards of DMG and the Work Plans.

a. Within thirty days of receipt by the Division of certification by SGC that it has completed a mitigation project or projects, the Division will request that the Work be inspected. Within thirty days after the Work has been inspected and a report provided to the Division, the Division will in writing either confirm that SGC has completed that mitigation

project or projects according to the approved Work Plans and the Reclamation Standards of the Division of Minerals and Geology or provide to SGC a written statement of the reasons why the Division believes that SGC has not done so. If the Division requests that DMG perform the inspections and DMG declines to do so, the Division will perform the inspections.

b. Within sixty days of a request by SGC, the Division will complete a Permit Termination Assessment pursuant to Section VIII of this Consent Decree.

c. Within sixty days after a Division determination of a Successful Permit Termination Assessment pursuant to Section VIII, the Division will, in accordance with then-existing procedures, commence termination of CDPS Permits No. CO-0027529 and CO-0036056 and any obligations of SGC thereunder and will complete termination in a reasonable time as permitted by its procedures. If not already accomplished, the Division will terminate the mitigation projects permit or permits and SGC will have no future obligations thereunder. The Division agrees, based on the facts of this case, that after a Successful Permit Termination Assessment and termination of these permits, no future CDPS point source permit will be required of SGC or its parent company for seeps or springs which emerge or increase in the Upper Animas River or Cement Creek drainages following installation and closure of bulkhead seals in the American or Terry Tunnels.

d. The Division will terminate CDPS stormwater permit COR-040061 (Gold Prince Mine) and that portion of CDPS stormwater permit COR-040052 (American Tunnel) covered by a mitigation project when the mitigation projects for those sites are confirmed by the Division to be completed pursuant to paragraph 8a. Termination of other

SGC stormwater permits will be governed by applicable regulations and not by this Consent Decree.

#### V. SUMMARY OF WORK

9. SGC, in consideration of the mutual undertakings set forth in this Consent Decree, agrees to perform the following Work:

a. American Tunnel/Terry Tunnel

During 1996, SGC will complete the seals permitted in the MLR Permit, and will close the valves at the Terry Tunnel and at the property line in the American Tunnel. Once the valves are closed, it is predicted that the mine pool will start to build and will eventually reach physical equilibrium. SGC will monitor the mine pool height. The mine pool will be considered to be at physical equilibrium when the rate of rise of the mine pool has leveled off, as defined by mutual agreement between SGC and DMG pursuant to the MLR Permit. Notice that equilibrium has been reached, as determined under the MLR Permit, will be provided by SGC to the Division within thirty days of such determination. Once the pool is at equilibrium, and after the two-year observation period required by the MLR permit, SGC will grout the valves and pipes in the bulkhead seals in the American and Terry Tunnels and place additional hydraulic seals downstream of the property line seal to eliminate the American Tunnel portal discharge and to allow final reclamation of the surface facilities as required by SGC's MLR Permit. Additional DMG approvals will be necessary for such further seals. SGC may also place infiltration controls to preclude water from entering the American Tunnel.

Should maintenance of the portion of the American Tunnel downstream of the SGC property line seal and treatment of the American Tunnel discharge be undertaken by the property owner or other parties, then SGC will be released from any continued CDPS permit obligation at the American Tunnel.

b. Mitigation Projects

SGC will undertake and timely complete mitigation projects as set forth in Appendix B. It is anticipated that completion of these projects will allow for final termination of CDPS Permits No. CO-0027529 and CO-0036056 while maintaining the Reference Water Quality in the Upper Animas Basin. SGC will complete all of the "A" List projects. Unless this Consent Decree is prematurely terminated pursuant to Section IX, SGC also will complete as many of the "B" List projects and additional mitigation projects as are necessary for achievement of permit termination pursuant to paragraph 14. SGC will have fulfilled its obligations with respect to each mitigation project when such project has been confirmed by the Division to be complete pursuant to paragraph 8a irrespective of subsequent water quality changes following such confirmation. Work Plans for each of the mitigation projects on the "A" and "B" lists are included in Appendix C and are hereby approved by the Division.

c. Cement Creek/Treatment Facility

To ensure against near-term adverse impacts on the Animas River from plugging of, and cessation of water treatment at, the American Tunnel, SGC will create a temporary water quality treatment "cushion" within the Upper Animas system to offset potential additional pollutant loading. During implementation of the mitigation projects, SGC



will divert stream flow from the mainstem of Cement Creek (including the North Fork of Cement Creek) to the current water treatment system for treatment. Upon valve closure at the Terry Tunnel and at the property line in the American Tunnel, SGC will adjust the American Tunnel treatment facility as necessary to accommodate the remaining flow from the lower American Tunnel and the diverted flow from Cement Creek. This stream diversion will be regulated in volume from essentially all stream flow in low-flow months up to the equivalent stream flow lost to the treatment system due to mine sealing during high flow. This diversion will be monitored and controlled to manage impacts at the Reference Point. Following completion of all mitigation projects on the A list, SGC may reduce or eliminate the treatment of Cement Creek at the American Tunnel treatment plant. SGC will notify the Division ten business days prior to substantially reducing the quantity of flows being treated relative to the treatment plant capacity. In its notice to the Division, SGC will provide its analysis that water quality will be maintained at the reference point (A72) with the decreased treatment of Cement Creek flows, and the amount that it intends to reduce these flows. The water treatment facility will remain in operational condition until a Successful Permit Termination Assessment pursuant to paragraph 14. Upon permit termination, the facility will be dismantled and the treatment ponds and surface disturbances reclaimed in accordance with SGC's DMG permit.

## VI. MONITORING

10. Monitoring Requirements. As long as the Consent Decree is in effect, or unless otherwise agreed in writing between the parties, SGC will monitor the following sites

according to the frequencies below. Each of these sites will be monitored for the following parameters: dissolved zinc, dissolved iron, dissolved aluminum, dissolved manganese, dissolved cadmium, dissolved copper, sulfate, hardness and pH. Analysis of these parameters will be conducted using methods capable of detecting concentrations at or below the following: dissolved zinc: 10 ug/l; dissolved iron: 50 ug/l; dissolved aluminum: 50 ug/l; dissolved manganese: 50 ug/l; dissolved cadmium: 1.0 ug/l; dissolved copper: 5 ug/l; sulfate: 5 mg/l. The monitoring requirements of this Consent Decree are separate and in addition to any monitoring requirements of SGC's CDPS permits and MLR permit.

a. SGC Permitted Area

(i). American Tunnel Influent to Wastewater Treatment Facility -

Sampled monthly until no flow exists or permits are terminated. Weekly flow measurements will be taken until no flow exists or permits are terminated.

(ii). Cement Creek Influent to Wastewater Treatment Facility -

Sampled monthly while Cement Creek is diverted. Weekly flow measurements will be taken until the diversion stops.

(iii). American Tunnel Treatment Facility Effluent (CDPS Permit No.

CO-0027529 Outfall 004A) - Sampled monthly.

(iv). Cement Creek below its confluence with the American Tunnel

effluent (known as water quality monitoring station C-20) - Sampled monthly until Cement Creek diversion and treatment of American Tunnel waters ceases.

(v). Terry Tunnel Wastewater Treatment Facility Influent - If flow exists, inflow will be sampled monthly, when accessible, until no flow exists or permits are terminated. Weekly flow measurements will be taken when accessible until no flow exists or permits are terminated.

(vi). Terry Tunnel Wastewater Treatment Facility Effluent - If treatment is required due to flow from portal, effluent will be sampled, when accessible, monthly until no flow exists.

(vii). Monitoring required by SGC's MLR permit will continue until SGC is released from its obligations by DMG. Monitoring required by SGC's CDPS permits will continue until SGC is released from those permit obligations.

b. Mitigation Sites. The receiving stream, both upstream and downstream of, and any water flowing from, the mitigation project sites identified below, will be monitored starting in the first field season of work activity at such project, and ending two years after each project is confirmed by the Division to be completed pursuant to paragraph 8a, or, if a "B" List project, at the time of either a Successful Permit Release Assessment pursuant to paragraph 14 or a Premature Termination pursuant to Section IX. Four samples will be collected yearly with at least one at high flow and at least two at low flow.

- (i). Koehler-Longfellow Portal and Mine Waste Dump.
- (ii). Gold Prince Mine.
- (iii). Columbus Mine.
- (iv). London Mine.

c. Water quality at the three stream mouth locations identified below will be monitored by SGC every other month. Water quality monitoring at these sites will be done within 24 hours of a water quality monitoring event at the Reference Point. These three sites are currently monitored for stream flow by the USGS with funding provided by the Southwest Colorado Water Conservation District. If this USGS stream flow monitoring ceases for any reason, SGC will measure and record a stream flow measurement with each sampling event. In the event that the stream gage at any of the stream mouth locations is frozen or inoperable, flow may be estimated based on a suitable correlation with a reference gage.

(i). Water quality monitoring station A-68 on the Animas River above its confluence with Cement Creek, also known as USGS Gage Site No. 09358000.

(ii). Water quality monitoring station C-48 on Cement Creek above its confluence with the Animas River, also known as USGS Gage Site No. 093358550.

(iii). Water quality monitoring station M-34 on Mineral Creek above its confluence with the Animas River, also known as USGS Gage Site No. 09359010.

d. Water Quality Reference Point. Water quality at the Water Quality Reference Point will be sampled at the frequency set forth in Appendix A. If requested by the Division, SGC will give a one-day notice of a monitoring event and will split samples with a Division representative who may be present.

e. SGC will report results of the required monitoring to the Division by the 28th day of the month following SGC's receipt of those monitoring results. If SGC monitors any parameter more frequently than specified at the agreed locations within the basin using

approved test procedures, the results of that monitoring will also be reported to the Division.

## VII. SCHEDULE

11. SGC will complete the seals in and close the valves at the Terry Tunnel and at the property line in the American Tunnel during the 1996 construction season. Treatment of Cement Creek and alkaline injection into the Mine pool (weather and conditions permitting) will begin concurrently with valve closure in the American Tunnel. The other mitigation projects will start within thirty days of valve closure in the American Tunnel and treatment of Cement Creek. Construction is confined to summer and fall months due to the heavy winter snowfalls that occur in the Upper Animas Basin.

The "A" List of primary projects will be substantially completed within the first two Field Seasons. Monitoring will begin concurrently with the commencement of Work by SGC under the Consent Decree. Upon completion of the "A" List projects, SGC will then implement as many of the "B" List projects, as needed. All "A" and "B" List projects required to maintain the Reference Water Quality will be completed in four Field Seasons. If additional mitigation projects are agreed to by the Parties pursuant to paragraph 13, a schedule for those projects will be agreed to by the Parties.

## VIII. PERMIT TERMINATION ASSESSMENT

12. Permit Termination Assessment. At any time following completion of all of the mitigation projects on the "A" List, SGC may submit an application for a Permit

Termination Assessment, certifying that in its professional judgment all of the criteria of paragraph 14 have been fulfilled.

a. In the event that the Permit Termination Assessment criteria of paragraph 14 below are met, the Consent Decree Completion provisions of Section X will apply.

b. In the event that the Permit Termination Assessment criteria of paragraph 14 below are not met, the Division will specify in what respect the criteria have not been met. SGC will then determine whether to continue with this Consent Decree by identifying and undertaking additional mitigation projects on the "B" List of Appendix B, whether to undertake additional projects not on the "A" or "B" lists, or whether to proceed to premature Consent Decree termination pursuant to Section IX.

13. Additional Remediation Measures. In the event that the Permit Termination criteria of paragraph 14 below are not met following completion of all the mitigation projects on both the "A" and "B" Lists, within sixty days after the Division notifies SGC of such a determination, SGC will notify the Division whether or not it intends to propose additional remediation projects which are anticipated to have a positive impact on the water quality of the Animas River. If SGC determines that it will propose additional such projects, it will submit proposed Work Plans for such projects to the Division within sixty days of the notification or within a reasonable time frame based on the accessibility of the site for planning and the complexity of the project. These Work Plans will be in substantially the same form and will contain all of the types of information contained in the Work Plans approved by the Division

for the projects listed in Appendix B. Within sixty days of SGC's submittal of Work Plans, the Division will notify SGC whether it approves or disapproves such Work Plans, and if it disapproves, will state its reasons. The Division will not unreasonably withhold its approval. If additional projects are approved, a permit for such projects will be issued by the Division.

14. The Division will determine that there has been a Successful Permit Termination Assessment if all of the following criteria are met:

a. Five years have elapsed from the date of valve closure at the American Tunnel property line plug.

b. Two years have elapsed since notice of mine pool equilibrium has been given pursuant to Paragraph 9a.

c. Valves and pipes in the seals in the American and Terry Tunnels have been grouted.

d. Hydrologic controls and seals eliminating flows from the lower American Tunnel portal have been completed, or CDPS Permit No. CO-0027529, for water treatment at the American Tunnel, will have been accepted by another party or parties.

e. All projects on the "A" List are confirmed by the Division to be complete pursuant to paragraph 8a.

f. Treatment of Cement Creek has ceased.

g. It is demonstrated in accordance with Appendix A that the Reference Water Quality is being maintained without continued treatment of Cement Creek.

15. The Division will determine that there has been a Failed Permit Termination Assessment if any of the criteria listed in Paragraph 14 above are not met.

**IX. PREMATURE TERMINATION OF CONSENT DECREE**

16. This Consent Decree may be prematurely terminated:

- a. By SGC, only after completion of all of the projects contained on the "A" List, if SGC determines that a Successful Permit Termination Assessment pursuant to paragraph 14 is not feasible.
- b. By the Division, only if SGC is not implementing the mitigation projects in accordance with the schedule established in this Consent Decree, or is not performing the mitigation projects in a workmanlike manner or in accordance with the Reclamation Standards of DMG and the Work Plans.

17. If either Party determines to prematurely terminate this Consent Decree, notification will be made and written explanation provided to the other party and to the Court at least sixty days prior to the effective date of the termination.

18. If this Consent Decree is prematurely terminated, SGC will treat any flow from the American Tunnel and the entire flow of Cement Creek up to a treatment capacity of 1800 gallons per minute in accordance with its CDPS permit for a period of thirty months thereafter. SGC's agreement to continue treatment of Cement Creek flows for thirty-month period after premature termination of this Consent Decree is made without conceding any legal responsibility other than that created by this Consent Decree to do so or any responsibility



other than that created by this Consent Decree for water quality conditions after placement of seals within the Mine. SGC specifically reserves any legal positions that it may have with respect to such issues, and nothing in this Consent Decree shall be construed as an admission or concession on such issues.

19. In the event that this Consent Decree is prematurely terminated, CDPS Permits No. CO-0027529 and CO-0036056 will remain in effect.

**X. SUCCESSFUL PERMIT TERMINATION ASSESSMENT/CONSENT  
DECREE COMPLETION**

20. In the event of a Successful Permit Termination Assessment pursuant to paragraph 14, the Consent Decree will be deemed completed, at which time (a) CDPS Permits No. CO-0027529 and CO-0036056 will be terminated, (b) SGC's mitigation projects permit or permits will be terminated, (c) SGC will be released from the financial surety requirement of paragraph 25, and (d) the Court's jurisdiction will cease. Notice of termination of these permits and Agreement Completion will be provided by the Division to SGC and to the Court.

21. Public notice of termination of permits will be provided in accordance with the Act and regulations.

22. The Division agrees, based on the facts of this case, that in the event of a Successful Permit Termination Assessment and termination of these permits no future CDPS point source permits will be required of SGC or its parent company for seeps or springs which may emerge or increase in the Upper Animas River or Cement Creek drainages following installation and closure of bulkhead seals in the American or Terry Tunnels.

## XI. PERMITS

23. All permits issued by the Division to SGC will be issued in accordance with all then-existing applicable statutes and regulations.

### 24. Permitting

a. Mitigation Projects Permit. A water quality permit substantially in the form of Appendix C will be issued by the Division to cover all of the mitigation projects contemplated by this Consent Decree. This permit will be terminated when the mitigation projects have been confirmed by the Division to be completed pursuant to paragraph 8a, and there will be no continuing obligation of SGC to maintain water quality permits or treatment at the mitigation project sites.

b. CDPS Permits Renewal. SGC will continue to operate the American Tunnel water treatment facilities until they are no longer necessary to maintain the dissolved zinc criterion at the Reference Point pursuant to Appendix A. Diversion of Cement Creek waters, which are different in character from mine water, may bring altered conditions into the American Tunnel water treatment system. Since the fourth quarter of 1993, SGC has passed all chronic Whole Effluent Toxicity (WET) tests at the Instream Waste Concentration (IWC) ratio, which demonstrates that the treated mine water discharge has not been toxic. SGC's renewal American Tunnel permit will not include WET testing after treatment of Cement Creek flow begins. The Division determined that if current treatment levels are maintained and Cement Creek flows are treated, downstream aquatic life uses will be protected. Effluent

limitations in the American Tunnel discharge permit will continue to be based on BAT standards until the permit is terminated.

c. Other Permits. All activities undertaken by SGC pursuant to this Consent Decree will be undertaken in accordance with the requirements of all applicable local, state and federal statutes, regulations, and ordinances. SGC will make timely application for any necessary permits or certifications. If other environmental permits are required for the mitigation projects, such as Section 404 permits or "reclamation only" MLR permits, the Division will cooperate with SGC in obtaining such permits from the appropriate agencies so that the projects can go forward in a timely fashion. If necessary permits for an "A" List project are ultimately denied by the responsible agency, that portion of the mitigation project will be deleted from the requirements of the Consent Decree, and an additional mitigation project will be implemented in its place. Work plans for any such projects will be submitted to the Division in accordance with paragraph 13.

## **XII. FINANCIAL SURETY**

25. Not later than thirty days after entry of this Consent Decree, SGC will provide financial surety in the amount of \$5,000,000 in the form of an irrevocable letter of credit, in the favor of the Water Quality Control Division of the Colorado Department of Public Health and Environment, issued by a federally chartered banking institution.

a. The Division may draw on the letter of credit if SGC files for bankruptcy or becomes bankrupt and discontinues treatment of water necessary to maintain

water quality and may use the proceeds to protect the waters of the state by entering and operating the treatment facility at the American Tunnel portal and disposing treatment residues at SGC's existing tailings pond.

b. This letter of credit will provide that it is irrevocable for a minimum initial period of one year and will be automatically extended for minimum additional one-year periods unless at least ninety days prior to an expiration date, the issuing institution has provided to the Division by registered mail or by courier, notice of its election not to extend the letter of credit.

c. If the financial institution elects not to extend the letter of credit, not later than forty-five days prior to its expiration, SGC will provide a letter of credit from an alternate federally chartered banking institution, its effective date to be such that there is no lapse of time in which there exists no financial surety.

d. The Division will be entitled, and the letter of credit will provide that the Division will be entitled, to draw a draft under the letter of credit in the event that (1) the letter of credit will terminate or expire within the next ten business days; and (2) the Division has not received notice from SGC that an alternate letter of credit has been provided. In the event that the Division elects to draw any drafts under these circumstances, it will not be entitled to retain or use any portion of the proceeds of the drafts unless the provisions of paragraph 25a are met. Instead, the Division will immediately deposit all of the proceeds of any drafts so obtained into one or more accounts. The amounts deposited in these accounts will serve as surety for SGC's obligations pursuant to paragraph 25. The Parties will

simultaneously enter into an escrow agreement with respect to each account that contains proceeds of the drafts on the same terms and conditions as for the above letter of credit, except that SGC will be entitled to withdraw the escrowed amount immediately to the extent that it provides a letter of credit to the Division from an alternate financial institution pursuant to this paragraph.

e. The Division will be entitled, and the letter of credit will provide that the Division will be entitled, to draw a draft under the letter of credit when its draft is accompanied by a signed statement by the Executive Director of the Colorado Department of Public Health and Environment or their designated representative and the Attorney General of the State of Colorado or their designated representative, certifying as follows:

We hereby certify that the State of Colorado is entitled to perform certain actions pursuant to paragraph 25a and/or 25c of the Consent Decree entered into by the State and Sunnyside Gold Corporation and the amount of the accompanying draft under letter of credit no. \_\_\_\_\_, dated \_\_\_\_\_, is anticipated or estimated to be necessary for the State's performance of these actions.

f. In the event that the Division draws upon the financial surety pursuant to either paragraph 25a or 25c above, the amounts will be placed in a custodial fund for its use pursuant to this Consent Decree.

g. SGC may terminate the financial surety at any time following a Successful Permit Termination Assessment pursuant to paragraph 14.

### **XIII. FORCE MAJEURE**

26. Definition of force majeure. Force majeure is defined, for the purposes of this Consent Decree, as an event, circumstance, or condition arising from cause(s) beyond the control of the Party asserting these force majeure provisions that prevents the performance of any obligation in this Consent Decree, or that causes delays in the performance of such an obligation that cannot be avoided through the exercise of due care. Force majeure will not include increased costs or expenses associated with the implementation of this Consent Decree, or changed financial circumstances; or the failure to apply in a timely manner for any required governmental permit, license, land use authorization or entitlement, or failure to make timely provision of all information required therefor; or the failure of SGC to obtain access on mitigation project sites not owned by it, thus preventing it from doing the project; or the failure of SGC to obtain access for the Division on mitigation project sites not owned by it pursuant to paragraph 34, thus preventing the Division from inspection of the project. Force majeure for the Division will not include lack of agency financial or staff resources.

27. Effect of force majeure. A force majeure will excuse either Party from timely performance of a particular obligation under this Consent Decree for that time during which the force majeure is in effect.

#### XIV. ENFORCEMENT OF CONSENT DECREE

28. Remedies for Breach. In the event that either Party breaches any term or condition of this Consent Decree, the nonbreaching Party may seek any appropriate relief in

this Court, including specific performance of obligations under the Consent Decree and relief pursuant to the contempt powers of this Court.

29. Effect of Bankruptcy Petition. The obligations imposed by this Consent Decree require the performance by SGC of actions which are reasonably designed to protect public health, welfare and the environment. Any enforcement of the obligations imposed by this Consent Decree constitutes, solely for the purposes of 11 U.S.C. § 392(b)(5) (1988), the enforcement of a judgment, other than a money judgment, obtained in an action to enforce the State's regulatory and police powers.

30. Conflict Between Consent Decree, Appendices, CDPS Permits and Work Plans. In the event of conflict between any requirement, term, condition, or provision of this Consent Decree and any requirement, term, or provision of any Work Plan, or of any appendix to this Consent Decree, or provision of any CDPS permit issued by the Division to SGC, the requirements, terms, conditions, and provisions of this Consent Decree will control. However, to the extent that such a permit is more specific than, or contains additional requirements, terms, conditions, and provisions not included in this Consent Decree, those requirements, terms, conditions, and provisions of the permit will be given effect.

#### XV. MUTUAL RELEASE AND COVENANT NOT TO SUE

31. Covenant-Not-To-Sue. In consideration of the actions to be performed by SGC under this Consent Decree, the Division covenants not to sue or to take administrative action against SGC for seeps or springs which may emerge or increase in the Upper Animas River or

Cement Creek drainages following installation of bulkhead seals in the American or Terry Tunnels, during the term of this Consent Decree and thereafter, if SGC fulfills the requirements of the Consent Decree, there is a Successful Permit Termination Assessment pursuant to paragraph 14 and permit termination is achieved. If this Consent Decree terminates other than through termination of the permits, the Division covenants not to sue or to take administrative action against SGC for actions taken or work performed by SGC pursuant to the terms of this Consent Decree, provided that the Work was performed in a workmanlike manner and in conformance with the Work Plans and DMG Reclamation Standards. Specifically, the Division will not assert in any administrative or judicial action that the acceleration of mine pool filling by injection of water, and the addition of alkalinity to such water, has caused the mine pool to become a treatment facility subject to point source discharge permit requirements.

#### **XVI. INDEMNIFICATION**

32. Indemnification of State by SGC. SGC agrees to hold harmless and indemnify the State against all claims for damages by non-parties to this Consent Decree to the extent that such claims arise from the acts or omissions of SGC, its agents, contractors, consultants, and employees in carrying out the mitigation projects required by or undertaken pursuant to any provision of this Consent Decree and its appendices. In consideration of actions to be performed by DMG under this Consent Decree, SGC covenants not to sue DMG for activities performed or not performed by DMG or related to this Consent Decree.



33. Nothing in this Consent Decree will be construed to limit the enforcement or other authorities of the Division except as provided in this Consent Decree. Nothing in this Consent Decree will be construed to limit the authority of any other Department or Division of the State of Colorado.

#### **XVII. ACCESS**

34. SGC will provide access to the mitigation project sites owned by SGC, excluding office areas, to the State, its Counsel, and such agents or consultants as the Attorney General or the Director of the Division may designate for monitoring the Work or the conditions which are addressed pursuant to this Consent Decree. SGC will use its best efforts to secure such access on mitigation project sites not owned by SGC.

#### **XVIII. NOTICE TO PARTIES**

35. Any notice, communication, or certification to be given pursuant to this Consent Decree will be in writing and will be given either in person or by certified mail, to the following persons at the following addresses, or to such other persons or addresses as the Parties may designate by providing written notice to the other party.

- a. Notice to SGC will be given to:

William B. Goodhard, Manager  
Sunnyside Gold Corporation  
P.O. Box 777  
Silverton, CO 81433

William C. Robb, Esq.  
Dufford & Brown, P.C.  
1700 Broadway, Suite 1700  
Denver, CO 80290-1790

b. Notice to the Division will be given by providing copies to each of the following:

J. David Holm, Director  
Water Quality Control Division  
Colorado Department of Public Health  
and Environment  
4300 Cherry Creek Drive South  
Denver, CO 80222

Robert J. Shukle, Chief  
Permits and Enforcement Section  
Water Quality Control Division  
Colorado Department of Public Health  
and Environment  
4300 Cherry Creek Drive South  
Denver, CO 80222

Karen A. Kishbaugh  
Assistant Attorney General  
Natural Resources Section  
Office of the Attorney General  
1525 Sherman Street, 5th Floor  
Denver, CO 80203

#### **XIX. AMENDMENT OF CONSENT DECREE**

36. The Parties may jointly petition the Court for amendment of this Consent Decree. Any amendment to any portion of this Consent Decree or any of its appendices must be in writing, must be approved by Court order, and will have as its effective date the date such order is entered by the Court or such other date as the Court may order.

**XX. RETENTION OF DISTRICT COURT JURISDICTION/  
DISPUTE RESOLUTION**

37. Retention of District Court Jurisdiction/Dispute Resolution. This Court will retain jurisdiction over this Consent Decree for the purpose of resolving any disputes regarding the interpretation or requirements of this Consent Decree and to resolve any disputes which may arise between the parties pursuant thereto. Any such dispute may be brought before the Court by a written motion from either party and the procedure for resolution of the dispute will be determined by the Court.

**XXI. EFFECTIVE DATE**

38. This Consent Decree shall become effective upon the date of its entry by the Court.

**XXII. GOVERNED BY COLORADO LAW**

39. The Consent Decree will be governed by the laws of the State of Colorado and will be interpreted consistent therewith.

**XXIII. LIST OF APPENDICES**

40. List of Appendices.

- A. Definition of water quality reference point;
- B. List of mitigation projects;
- C. Permit for mitigation projects with attached Work Plans;

D. Renewal CDPS Permit No. CO-0027529.

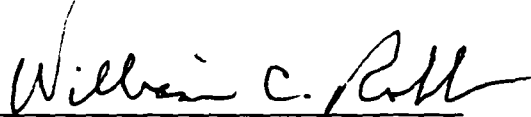
SO ORDERED this \_\_\_\_ day of \_\_\_\_\_, 1996.

*Nancy E. Rico*  
\_\_\_\_\_  
District Court Judge

COURTROOM 7 MAY 8 1996

The undersigned parties hereby consent to the entry by the Court of this Consent Decree in the case of Sunnyside Gold Corporation v. Colorado Water Quality Control Division, Colorado Department of Public Health and the Environment, # 94 CV 5459, District Court, City and County of Denver.

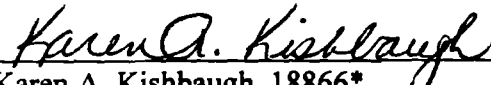
**DUFFORD & BROWN, P.C.**

  
William C. Robb, 5898  
1700 Broadway, Suite 1700  
Denver, CO 80290-1701  
Telephone: (303) 861-8013

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Solicitor General  
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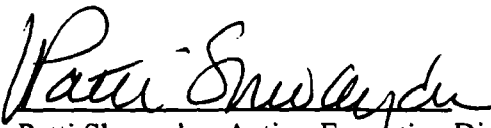
  
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Assistant Attorney General  
Natural Resources Section

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**SUNNYSIDE GOLD CORPORATION**

  
Richard C. Kraus, President

**COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT**

  
Patti Shwayder, Acting Executive Director,  
Colorado Department of Public Health and Environment

**WATER QUALITY CONTROL DIVISION OF THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT**

  
David Holm, Director  
Water Quality Control Division  
Colorado Department of Public Health and Environment

## **APPENDIX A**

### **Reference Water Quality**

#### **A-1 Definition of "Reference Water Quality" and the Time Periods of Concern**

"Reference water quality" is defined as a statistical determination of dissolved zinc (Zn) concentrations at reference point A-72 for the time period of January 5, 1989 through September 6, 1995. During this time there exist 63 measurements of dissolved zinc at the reference point which also have either simultaneous measurements of stream flow or inferred stream flows based on linear regression analysis of flow data from the Howardsville Station to Station A72. The set of 63 measurements of coupled flow and dissolved Zn data collected is termed "the baseline set" representing the available history of dissolved Zn and stream flow at the reference point. This set of data defines reference water quality against which future water quality will be compared. The reference water-quality data are listed in Attachment 1.

Time following the signing of a Consent Agreement between the State of Colorado and Sunnyside Gold Company (SGC) shall be divided into two periods:

- ▶ "Project period" is defined to be the time period that begins with the initiation of mine closure and reclamation activities that are the subject of the Consent Agreement and ends when (a) A-list projects have been completed; (b) mine pool equilibrium has been reached; (c) Cement Creek treatment has ceased; and (d) lower American Tunnel hydrologic controls and portal plug are complete.
- ▶ "Post-project period" is defined to be the time period that begins immediately after the "project period" and ends when SGC has been released from water-quality permits under the terms of the Consent Agreement.

#### **A-2 Classes of Flow**

The high-mountain portion of a river such as the Animas is subject to seasonal fluctuations in flow due to hydrologic response of the basin to climatic factors. Flow and the concentration of dissolved constituents in any river water are generally inversely related.

Based on measurements of stream flow at reference point A-72 from 1991-1995, flow conditions at this point on the Animas consist of three classes:

- ▶ Low Flow (stream flow < 100 cubic feet per second)
- ▶ Intermediate Flow (100 cfs < stream flow < 300 cfs)
- ▶ High Flow (stream > 300 cfs)

Each of these classes of flow conditions represents a physical response to the complex factors that may govern interactions between meteoric water and the geology. It is appropriate to evaluate water quality separately for each of the three classes.

A-3 Method for Evaluating Water Quality with Respect to Reference Conditions During the Project Period

- (a) Each month during the project period, SGC will collect a water-quality sample at Station A72. Analyses shall be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been approved by the Division. SGC will obtain the stream-flow datum that applies to the relevant sampling event from the USGS data collection system. In the event that the stream gage at A-72 is frozen and/or inoperable yet a water sample is obtained, flow may be estimated.
- (b) SGC will report the flow value and the dissolved zinc value in a written submittal to WQCD. The submittal will be presented together with the next monthly Discharge Monitoring Report that is due to WQCD following receipt by SGC of the laboratory report for the dissolved zinc value. Records of monitoring information shall include:
  - 1. The date, exact place, and time of sampling or measurements;
  - 2. The individual(s) who performed the sampling or measurements;
  - 3. The dates the analyses were performed;
  - 4. The individual(s) who performed the analyses;
  - 5. The analytical techniques or methods used; and
  - 6. The results of such analyses.
- (c) In addition to reporting the data, SGC will calculate and report an analysis of the data in the following form:
  - ▶ Each month, SGC will calculate an index value representing relative number of standard deviations of the observed value of dissolved Zn from the mean value of dissolved Zn for the appropriate flow class in the reference water-quality set. The index number is calculated as:

$$N_i = (x_i - \bar{x}_f) / s_f \text{ where}$$

$N_i$  is the index number;

$x_i$  is the observed value of dissolved Zn for the reporting period or the average of dissolved Zn values if more than one sample is taken in the reporting period;

$\bar{x}_f$  is the mean value of dissolved Zn in the reference water-quality set for the flow class to which the observed value belongs; and

$s_f$  is the standard deviation of dissolved Zn in the reference water-quality set for the flow class to which the observed value belongs.

- ▶ The index numbers will be plotted against the sampling period number (which begins with the number 1 as the first sampling event of the project period) on a graph which has the index number (called "normalized residual") as the ordinate and the sampling period number as the abscissa. An example of such a graph is shown on Figure 1a.
- ▶ SGC will compute a 12-month moving average of the index numbers, as follows. Beginning with the twelfth (12th) month of the project period, SGC will compute the mean of the index numbers for the 12-month period. In each subsequent month, the oldest index number will be dropped and the newest index number added to the set of 12 from which the mean index number is being computed.
- ▶ The moving-average index number also will be plotted over time, as shown in the example of Figure 1b.

(d) Evaluation of the normalized data will be performed as follows:

- ▶ If a single observation has an index number greater than +2.0 (i.e., that observation has a concentration of dissolved Zn greater than 2 standard deviations above the mean value of dissolved zinc for the relevant flow class in the data of the reference water-quality set), SGC will have a repeat analysis done on the sample.
- ▶ If two out of three consecutive observations have index values greater than +2.0, then SGC will report by the 28th day of the month following receipt of the second of those observations:



1. which subbasin is experiencing the increase;
2. the nature of the ongoing remediation activities in the affected basin(s); and
3. known activities not related to mine closure taking place in the affected basin.

If the increase is related to mine closure, SGC will specify the actions and time table to be implemented to reverse the trend.

- ▶ If the moving average index number of the most recent 12-month period exceeds a value of +0.577 (representing the upper value of the range of normalized residual values expected in a twelve-period sample at a confidence level of 97.5% around the mean computed on a flow class - by - flow class basis), SGC will meet with WQCD to discuss the data and determine what, if any action is required. The initial action, if any is deemed necessary, will be for SGC to investigate possible causes of the elevated Zn values. If the cause is related to the sealing of the mine or due to mitigation projects, SGC will respond either by increased treatment of Cement Creek, adjustment of the water elevation of the mine pool, or implementation of the "B" list of projects. If the "B" list of projects already has been completed, SGC may add additional mitigation projects under Paragraph 13.
- ▶ Should new, adverse effects on dissolved Zn values in the Upper Animas Basin occur through man-made or natural causes that are not caused by closure activities of the Sunnyside Mine or mitigation activities carried out by SGC under this Agreement, SGC will document and monitor the causes and their effects so that a mathematical adjustment can be made to the observational data at A72 prior to using the information in statistical analyses of water quality.

**A-4 Method of Evaluating Water Quality with Respect to Reference Conditions - Post Project Period**

- (a) During the Post-Project Period, SGC will collect at least 13 samples during the low-flow class and 12 samples in each of the medium and high-flow classes, subject to the following conditions:
  - ▶ The sample interval shall be  $\geq$  seven (7) days;

- ▶ The sample interval shall be  $\leq$  forty-five (45) days (in the event of extreme winter conditions at A-72, the 45 day maximum may be extended);
  - ▶ The post-project monitoring period will be at least two (2) years.
- (b) Computation and graphing of the index numbers (as described in Section A-3 above) will continue through the post-project period.
- (c) When the conditions of A-4(a) have been met and SGC is satisfied that the closure activities have met the permit release criteria of paragraph 14 of the Consent Decree, SGC may present an analysis of the post-project period, as follows:
- ▶ For each flow class in the post-project period, SGC will compile the observed values of dissolved zinc and compute the mean and standard deviation of those values.
  - ▶ For each flow class, the average dissolved zinc concentration of the post-project period will be compared to the average dissolved zinc concentration of the equivalent flow class in the reference water-quality set using a one-sided t-test for the difference of two means at the 0.05 significance level using the procedure of paragraph 3-3.2.1 of National Bureau of Standards Handbook 91, Experimental Statistics (1966, p. 3-34); see Attachment 2.
- (d) If the conditions of paragraph 14 of the Consent Agreement have been met and the statistical tests of Section A-4(c) show that there has not been a statistically discernible increase in dissolved Zn concentrations at the reference point, SGC will be entitled to permit release under the terms of paragraph 8 of the Consent Agreement.

## Attachment 2

### Application of the One-sided T-test to Dissolved Zinc Concentrations at A-72

#### For each flow class:

- (1) Compile the dissolved Zn data for the two data sets, and calculate for the number of samples each set.
- (2) Let  $\alpha$ , the significance level of the test, be 0.05.
- (3) Look up  $t_{1-\alpha}$  for  $df = n_R + n_M - 2$  in Table A - 4 of NBS - 91, where

df = degrees of freedom;

$n_R$  = number of samples in the reference set; and

$n_M$  = number of samples in the monitoring set.

- (4) Compute the mean ( $\bar{x}_R$  and  $\bar{x}_M$ ) and variance ( $s_R^2$  and  $s_M^2$ ) for the reference (R) and monitoring (M) sets.
- (5) Compute the pooled variance of the two data sets

$$sp = \sqrt{\frac{(n_R - 1)s_R^2 + (n_M - 1)s_M^2}{n_R + n_M - 2}}$$

- (6) Compute the test statistic,  $u$

$$u = t_{1-\alpha} * sp * \sqrt{\frac{n_R + n_M}{n_R * n_M}}$$

- (7) If  $(\bar{x}_M - \bar{x}_R) > u$ , decide that the average of the post-closure monitoring period exceeds that of the reference water quality set; otherwise, decide that there is no reason to believe that the average of the post-closure monitoring period exceeds the average of the reference water quality set.

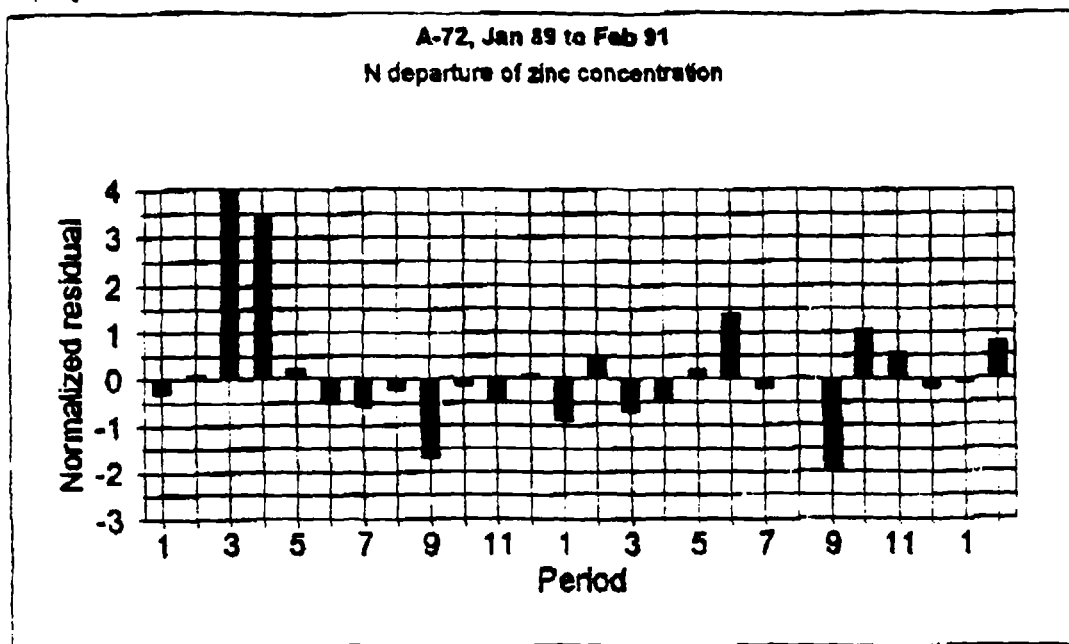
REFERENCE WATER QUALITY DATA - BY DATE									
DATE	Q	ZN							
5-Jan-89	30	510							
14-Feb-89	22	550							
7-Mar-89	17	940							
24-Apr-89	216	670							
30-May-89	1125	320							
29-Jun-89	472	240							
24-Jul-89	226	300							
2-Aug-89	385	270							
4-Sep-89	69	370							
5-Oct-89	87	360							
2-Nov-89	40	490							
13-Dec-89	22	550							
10-Jan-90	20	450							
6-Feb-90	14	590							
5-Mar-90	14	470							
19-Apr-90	51	490							
2-May-90	72	560							
14-Jun-90	1238	450							
12-Jul-90	312	350							
1-Aug-90	93	380							
4-Sep-90	69	340							
8-Oct-90	231	520							
7-Nov-90	98	450							
17-Dec-90	46	520							
16-Jan-91	38	530							
18-Feb-91	27	620							
5-Sep-91	131	380							
6-Sep-91	185	370							
7-Sep-91	261	310							
9-Sep-91	269	260							
10-Sep-91	263	270							
21-Oct-91	75	400							
30-Apr-92	512	440							
26-May-92	865	220							
23-Jun-92	854	240							
24-Jun-92	874	290							
25-Jun-92	905	160							
23-Jul-92	372	240							
19-Aug-92	134	360							
24-Sep-92	121	370							
14-Oct-92	80	480							
15-Oct-92	78	510							
22-Oct-92	83	470							
15-Jun-93	2090	180							
20-Jul-93	434	290							
21-Jul-93	434	260							
23-Aug-93	209	270							
28-Sep-93	124	370							

DATE	Q	ZN						
10-Nov-93	86	520						
29-Mar-94	80	670						
16-May-94	654	510						
18-May-94	603	500						
2-Jun-94	1370	300						
27-Jun-94	677	200						
18-Jul-94	173	300						
26-Jul-94	159	360						
28-Sep-94	143	370						
9-Nov-94	106	550						
18-Jan-95	72	680						
7-Feb-95	90	600						
12-Apr-95	127	790						
21-Jun-95	1950	350						
6-Sep-95	239	360						
<b>SORTED BY FLOW IN EACH FLOW CLASS</b>								
<b>Q &lt; 100 cfs</b>			<b>100 cfs &lt; Q &lt; 300 cfs</b>			<b>Q &gt; 300 cfs</b>		
DATE	Q	ZN	DATE	Q	ZN	DATE	Q	ZN
6-Feb-90	14	590	9-Nov-94	106	550	12-Jul-90	312	350
5-Mar-90	14	470	24-Sep-92	121	370	23-Jul-92	372	240
7-Mar-89	17	940	28-Sep-93	124	370	2-Aug-89	385	270
10-Jan-90	20	450	12-Apr-95	127	790	20-Jul-93	434	290
14-Feb-89	22	550	5-Sep-91	131	380	21-Jul-93	434	260
13-Dec-89	22	550	19-Aug-92	134	360	29-Jun-89	472	240
18-Feb-91	27	620	28-Sep-94	143	370	30-Apr-92	512	440
5-Jan-89	30	510	26-Jul-94	159	360	18-May-94	603	500
16-Jan-91	38	530	18-Jul-94	173	300	16-May-94	654	510
2-Nov-89	40	490	6-Sep-91	185	370	27-Jun-94	677	200
17-Dec-90	46	520	23-Aug-93	209	270	23-Jun-92	854	240
19-Apr-90	51	490	24-Apr-89	216	670	26-May-92	865	220
4-Sep-89	69	370	24-Jul-89	226	300	24-Jun-92	874	290
4-Sep-90	69	340	8-Oct-90	231	520	25-Jun-92	905	160
2-May-90	72	560	8-Sep-95	239	360	30-May-89	1125	320
18-Jan-95	72	680	7-Sep-91	261	310	14-Jun-90	1238	450
21-Oct-91	75	400	10-Sep-91	263	270	2-Jun-94	1370	300
15-Oct-92	78	510	9-Sep-91	269	260	21-Jun-95	1950	350
14-Oct-92	80	480				15-Jun-93	2090	180
29-Mar-94	80	670						
22-Oct-92	83	470						
10-Nov-93	86	520						
5-Oct-89	87	360						
7-Feb-95	90	600						
1-Aug-90	93	380						
7-Nov-90	98	450						
<b>Mean</b>		<b>519</b>			<b>399</b>			<b>306</b>
<b>Std Dev</b>		<b>124</b>			<b>144</b>			<b>104</b>

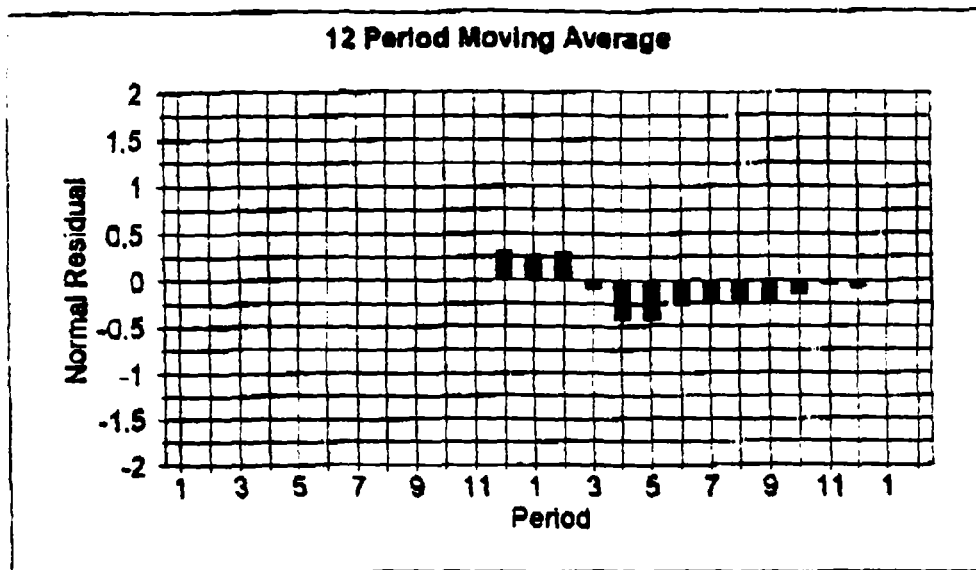
Figure 1

1/11/96

1a.



1b



UNITED STATES DEPARTMENT OF COMMERCE • Luther H. Hodges, Secretary  
NATIONAL BUREAU OF STANDARDS • A. V. Astin, Director

# Experimental Statistics

Mary Gibbons Natrella  
National Bureau of Standards

Reprint of the Experimental Statistics Portion  
of the AMC Handbook

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National Bureau of Standards Handbook 91

Issued August 1, 1963

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TABLE A-4. PERCENTILES OF THE  $t$  DISTRIBUTION

df	$t_{.99}$	$t_{.95}$	$t_{.90}$	$t_{.85}$	$t_{.80}$	$t_{.75}$	$t_{.70}$	$t_{.65}$
1	.325	.727	1.376	3.078	6.314	12.706	31.821	63.657
2	.289	.617	1.061	1.886	2.920	4.303	6.965	9.925
3	.277	.584	.978	1.638	2.353	3.182	4.541	5.841
4	.271	.569	.941	1.533	2.132	2.776	3.747	4.604
5	.267	.559	.920	1.476	2.015	2.571	3.365	4.032
6	.265	.553	.906	1.440	1.943	2.447	3.143	3.707
7	.263	.549	.896	1.415	1.895	2.365	2.998	3.499
8	.262	.546	.889	1.397	1.860	2.306	2.896	3.355
9	.261	.543	.883	1.383	1.833	2.262	2.821	3.250
10	.260	.542	.879	1.372	1.812	2.228	2.764	3.169
11	.260	.540	.876	1.363	1.796	2.201	2.718	3.106
12	.259	.539	.873	1.356	1.782	2.179	2.681	3.055
13	.259	.538	.870	1.350	1.771	2.160	2.650	3.012
14	.258	.537	.868	1.345	1.761	2.145	2.624	2.977
15	.258	.536	.866	1.341	1.753	2.131	2.602	2.947
16	.258	.535	.865	1.337	1.746	2.120	2.583	2.921
17	.257	.534	.863	1.333	1.740	2.110	2.567	2.898
18	.257	.534	.862	1.330	1.734	2.101	2.552	2.878
19	.257	.533	.861	1.328	1.729	2.093	2.539	2.861
20	.257	.533	.860	1.325	1.725	2.086	2.528	2.845
21	.257	.532	.859	1.323	1.721	2.080	2.518	2.831
22	.256	.532	.858	1.321	1.717	2.074	2.508	2.819
23	.256	.532	.858	1.319	1.714	2.069	2.500	2.807
24	.256	.531	.857	1.318	1.711	2.064	2.492	2.797
25	.256	.531	.856	1.316	1.708	2.060	2.485	2.787
26	.256	.531	.856	1.315	1.706	2.056	2.479	2.779
27	.256	.531	.855	1.314	1.703	2.052	2.473	2.771
28	.256	.530	.855	1.313	1.701	2.048	2.467	2.763
29	.256	.530	.854	1.311	1.699	2.045	2.462	2.756
30	.256	.530	.854	1.310	1.697	2.042	2.457	2.750
40	.255	.529	.851	1.308	1.684	2.021	2.423	2.704
60	.254	.527	.848	1.296	1.671	2.000	2.390	2.660
120	.254	.526	.845	1.289	1.658	1.980	2.358	2.617
$\infty$	.253	.524	.842	1.282	1.645	1.960	2.326	2.576

Adapted by permission from *Introduction to Statistical Analysis* (2d ed.) by W. J. Dixon and F. J. Massey, Jr., Copyright, 1967, McGraw-Hill Book Company, Inc. Entries originally from Table III of *Statistical Tables* by R. A. Fisher and P. Yates, 1938, Oliver and Boyd, Ltd., London.



## 3-3.2 DOES THE AVERAGE OF PRODUCT A EXCEED THE AVERAGE OF PRODUCT B?

3-3.2.1 (Case 1)—Variability of A and B is Unknown, but can be Assumed to be Equal.

## Data Sample 3-3.2.1—Surface Hardness of Steel Plates

A study was made of the effect of two grinding conditions on the surface hardness of steel plates used for intaglio printing. Condition A represents surfaces "as ground" and Condition B represents surfaces after light polishing with emery paper. The observations are hardness indentation numbers.

Condition A	Condition B
187	157
157	152
152	148
164	158
159	161
164	
172	

## [One-sided t-test]

- | Procedure  | Example  |
|--|--|
| (1) Choose $\alpha$ , the significance level of the test.  | (1) Let $\alpha = .05$   |
| (2) Look up $t_{1-\alpha}$ for $\nu = n_A + n_B - 2$ degrees of freedom in Table A-4.  | (2) $n_A = 7$<br>$n_B = 5$<br>$\nu = 10$<br>$t_{.95}$ for 10 d.f. = 1.812  |
| (3) Compute: $\bar{X}_A$ and $s_A^2$ , $\bar{X}_B$ and $s_B^2$ , from the $n_A$ and $n_B$ measurements from products A and B, respectively.  | (3) $\bar{X}_A = 165$<br>$s_A^2 = 134$<br>$\bar{X}_B = 155.2$<br>$s_B^2 = 26.7$  |
| (4) Compute<br>$s_P = \sqrt{\frac{(n_A - 1)s_A^2 + (n_B - 1)s_B^2}{n_A + n_B - 2}}$  | (4)<br>$s_P = \sqrt{\frac{6(134) + 4(26.7)}{10}}$ $= \sqrt{91.08}$ $= 9.544$   |
| (5) Compute<br>$u = t_{1-\alpha} s_P \sqrt{\frac{n_A + n_B}{n_A n_B}}$   | (5)<br>$u = (1.812)(9.544) \sqrt{\frac{12}{35}}$ $= 17.294 (.5855)$ $= 10.1$   |
| (6) If $(\bar{X}_A - \bar{X}_B) > u$ , decide that the average of A exceeds the average of B; otherwise, decide there is no reason to believe that the average of A exceeds the average of B.                                      | (6) $(\bar{X}_A - \bar{X}_B) = 9.8$ , which is not larger than $u$ . There is no reason to believe that the average hardness for Condition A exceeds the average hardness for Condition B. |
| (7) Let $m_A$ and $m_B$ be the true averages of A and B. Note that the interval from $\{(\bar{X}_A - \bar{X}_B) - u\}$ to $\infty$ is a $1 - \alpha$ one-sided confidence interval estimate of the true difference $(m_A - m_B)$ . | (7) $(\bar{X}_A - \bar{X}_B) - u = 9.8 - 10.1 = -0.3$ . The interval from $-0.3$ to $\infty$ is a 95% one-sided confidence interval estimate of the true difference between averages.      |

## **APPENDIX B**

### **MITIGATION PROJECTS**

#### **B-1 Mitigation Projects**

SGC is listing nine mitigation projects which will offset potential loading increases resulting from waters returning to their natural flow paths around the Sunnyside Mine. The projects are listed as "A" list or primary (those projects on which work will commence after the hydraulic seal valves are closed) and "B" list or secondary (those projects which may need to be completed in order for the dissolved zinc concentrations to meet the criteria at Reference Point AR-72). The secondary list will be evaluated after the primary list has been completed and the reference water quality can be monitored to see the effects of the completed primary projects on maintaining the dissolved zinc loading from the Upper Animas Basin. Completion of all projects on the secondary list may not be necessary if the reference water quality in the Animas is being maintained without them.

SGC will evaluate, engineer and complete work in a workmanlike, safe, proper and expedient manner according to the work plans attached to this Consent Decree. All work on mitigation sites will focus on reducing the dissolved zinc loading at the reference point and not on meeting specific standards at each mitigation site.

Mitigation on sites not owned or controlled by SGC will require permission of property owners to enter their property to evaluate and do mitigation work. Should SGC identify more beneficial projects, they will replace other projects on the "B" or secondary project list with concurrence from WQCD.

#### **B-2 "A" List - Primary Projects**

##### **(1) Sunnyside Mine Pool**

After closure of the valve in the property line seal, SGC will introduce high pH water into the pool during filling of the mine pool. The projected target pH of mine water would be 9.0 to 10.0 versus current 6.5 at the American Tunnel. This will allow for the mine pool to reach equilibrium from a basic pH as oxygen is depleted rather than from an acid pH.

##### **(2) Mine Waste Dump - South Fork of Cement Creek**

The remainder of the mine waste dump will be removed and consolidated with addition of high pH material for stability. The area underlying the waste dump will be revegetated in accordance with SGC's MLR permit. The consolidated material will be capped and revegetated.

(3) Surface Mill Tailings at Eureka - Eureka Townsite

The surface tailings at Eureka will be removed from contact with stream water and consolidated with addition of high pH material for stability. Due to this area existing in an alluvial fan which consists primarily of gravel, no revegetation will be done. The consolidated material will be capped and revegetated.

(4) Gold Prince Mill Tailings and Closure Bulkhead - Head of Placer Gulch

The existing closure bulkhead which prevents entry will be reinforced and the portal will be reshut to create a water retaining bulkhead. The surface mill tailings will be removed and consolidated with high pH material. Disturbances will be revegetated. The consolidated material will be capped and revegetated.

(5) Koehler Longfellow Portal and Mine Waste Dump - Headwaters of Mineral Creek

The mine waste dumps will be removed from the creek bottoms and consolidated with high pH material for stability. Areas that do not occur within talus slopes will be revegetated. The consolidated material will be capped and revegetated. Run-on controls will be constructed to isolate clean waters from running across or through waste materials.

During reclamation of the mine waste dumps, SGC will evaluate and analyze water flows from two existing adits. SGC will perform bench scale studies on alternative mine drainage treatment options during 1996 and 1997. SGC will assess the improvement in zinc loading between the Koehler and Longfellow adits and monitoring point M-2 during 1996 and 1997 and will prepare an engineering design for a bio-pass treatment system. At the completion of the studies and reclamation work, SGC will provide \$200,000 to a fund as directed by WQCD, which funds will be utilized for water quality improvement or remedial projects to address impacts of past mining in the Upper Animas River basin.

(6) Boulder Creek Mill Tailings - Upstream of confluence of Boulder Creek and Animas River

The tailings will be removed and consolidated with high pH material for stability. The disturbed areas will be revegetated. The consolidated material will be capped and revegetated.

(7) Pride of the West Mill Tailings - Howardsville

The historic tailings will be removed from contact with stream water on the west side of the property. The material removed will be consolidated and the disturbed areas revegetated.

**B-3 "B" List - Secondary Projects**

(8) Columbus Mine Portal - Animas Forks

A bulkhead will be installed in two adits to prevent direct mine discharge in order to restore the hydrologic regime to near premining conditions.

(9) London Portal - Headwaters of Animas River

A bulkhead will be installed in the adit to prevent direct mine discharge in order to restore the hydrologic regime to near premining conditions.

**APPENDIX C**  
**CDPS PERMIT #CO-0044768**  
**Mine Remediation Projects**  
**with Work Plans**

**COLORADO DISCHARGE PERMIT SYSTEM (CDPS)**

**SUMMARY OF RATIONALE**

**SUNNYSIDE GOLD CORPORATION**

**MINE REMEDIATION PROJECTS WITH**

**NO RESIDUAL DISCHARGE FOLLOWING PROJECT COMPLETION**

**CDPS PERMIT NUMBER CO-0044768, SAN JUAN COUNTY**

**I. TYPE OF PERMIT** *New Permit*

**II. ADMINISTRATIVE INFORMATION**

**A. Facility Type:** *Mine Dewatering and Milling With No Discharge*  
**Fee Category:** *Category 03, Subcategory 4*  
**Category Flow Range:** *No Discharge (At Completion of Remedial Activity)*  
**Annual Fee:** *\$1,519*

**B. SIC Code:** *1041*

**C. Party Performing Remediation:** *William Goodhard, Manager  
Sunnyside Gold Corporation  
P.O. Box 177  
Silverton, CO 81433  
(303) 387-5533*

**E. Facility Location:**

*The mine sites that will be remediated are located in the upper Animas River basin, and are associated with a consent agreement between the permittee and the Water Quality Control Division that is related to the plugging of the American Tunnel mine portal. The permittee has submitted Mine Remediation Plans (MRP's) for each site that has been identified to-date, with detailed location information. Any additional sites identified in the future will be described in similar MRP's that will be submitted to the Water Quality Control Division.*

**F. Discharge Point(s):**

*The receiving streams and specific locations associated with discharges from individual sites are described in the MRP's that have been, or will be, submitted for each waste site.*

**III. DISCHARGES AUTHORIZED BY THIS PERMIT:**

*The sites that will be permitted are likely to discharge pollutants to waters of the State as a result of: 1) precipitation falling on top of and then running off the site, 2) surface drainage from other catchment areas flowing across the site, or, 3) short term releases of water held within the sites which may be released during site excavation. Such discharges are subject to regulation as "point sources" through the Colorado Discharge Permit System (CDPS), and are not allowable except as authorized through the issuance of a permit which contains terms and conditions that are developed in compliance with the Colorado Discharge Permit System Regulations (6.1.0).*

*While the remediation actions will eventually eliminate direct exposure of mine waste to precipitation or surface drainage, and discharges of water stored within the waste will only be temporary and mitigated to the maximum extent practicable, it is necessary to provide permit coverage of all such discharges until the remediation actions have been completed.*

*It should be noted that one of the remediation actions that will be included in this permit, which involves the chemical adjustment of pooled mine water, does not involve mine waste. That project will accelerate filling of the mine pool and will force final pH equilibrium from a basic pH rather than an acidic pH.*

*During the implementation of these mine remediation projects, discharges from the American Tunnel or the Terry Tunnel will continue to be subject to CDPS permits No. CO-0027529 or CO-0036056.*

*The remediation projects that will be covered by this permit are listed below, and are fully described within the permit itself. Each project will be treated as an attachment to the permit, and will be identified as shown below:*

Mine Remediation Project	Attachment Abbreviation	Number of Pages
American Tunnel Mine Waste Dump	AT	8
Boulder Creek Tailings Project	BC	7
Columbus Mine Portals Mine Waste Dumps	CM	8
Surface Mill Tailings at Eureka	ET	7
Gold Prince Mill Tailings	GP	10
Longfellow Koehler Mine Waste Project	LK	14
London Mine Portals Waste Dumps	LM	8
Pride of the West Tailings	PW	8
Sunnyside Mine Pool Mitigation - Alkaline Solution Injection	SP	6

#### IV. TERMS AND CONDITIONS OF PERMIT

##### A. Mine Remediation Plan

*Upon beginning remediation work at a site, the permittee is required to fully implement the Mine Remediation Plan (MRP) that has been submitted for that site.*

**B. Monitoring and Reporting**

The permittee is required to perform whatever oversight is necessary to insure that the MRP is being implemented, and shall comply with all monitoring and reporting conditions included in the MRP. At a minimum, monthly reports are required for any water quality data that is collected as part of a MRP. In addition, quarterly reports must be submitted which include: 1) a narrative description of the current status of the remediation project, 2) a summary of analytical results for any sampling that was specified in the MRP for the site in question, 3) a photographic survey of the sites (both pre-remediation waste location and post-remediation waste location) involved in the remediation action. Reports must be received by the 28th day of the month following the calendar quarter or month for which the report is being submitted.

**C. Legal Right To Enter**

Prior to beginning on-site work for any remediation project, the permittee must submit documentation to the Water Quality Control Division showing that the permittee has been granted permission to enter the property(ies) where work will be carried out.

**D. Termination**

This mine remediation projects permit may be terminated in accordance with the terms of the Consent Decree when the remediation projects are completed.

**V. CHANGES MADE AFTER PUBLIC NOTICE**

Three Sunnyside Gold Corporation permits were sent to public notice - CO-0027529, which is for the American Tunnel discharge, CO-0036056, which is for the Terry Tunnel discharge, and CO-0044768, which is for mine remediation projects in the Upper Animas basin. In addition, a related draft Consent Decree that has been negotiated between the Division and the mining company was in the same public notice.

Responses to the public notice were received from private citizens, a committee of members of the Animas River Stakeholders group, several environmental and mining industry oriented groups, several governmental agencies, and the Sunnyside Gold Corporation itself.

Most of the comments received were related to the consent decree, which is being dealt with separately from the discharge permits.

With respect to this discharge permit, the following issues were raised:

- 1) **Comment:** The CDPS permits must function as stand alone documents, regardless of the existence of the consent decree.

**Response:** The permits were reviewed to find any terms or conditions that through reference were dependent upon the contents of the consent decree. Where such permit conditions were found, they were revised to more explicitly describe the intended permit requirements. However, there is one exception to this that should be noted. Each draft permit included a termination clause which referred directly back to the consent decree. While this clause was modified to additionally require compliance with State permit regulations, it was determined that it would not be practical to include the consent decree's conditions related to permit termination within the permits themselves. Also, the termination clauses do not affect the enforceability of the permits. For these reasons, the termination clauses' references to the consent decree were retained.

- 2) **Comment:** The draft permit for Mine Remediation Projects should include criteria for what must be included in a Mine Remediation Plan (MRP). Such criteria should be similar to those that have been developed for the draft General Permit for Stormwater Discharges Associated with Metal Mining Operations and Mine-Waste Remediation (Permit Number COR-040000, Parts I.C.1. - I.C.6), with particular emphasis on erosion control during and after the project.



**Response:** The Mine Remediation permit has been revised to incorporate criteria which are very similar to the requirements of the above-referenced sections of the General Permit for Stormwater.

- 3) **Comment:** The Mine Remediation permit should include other Storm Water Management Plan conditions of the General Permit for Stormwater that are related to plan preparation, implementation, retention, submittal, review and approval, plan changes, non-stormwater discharges, inspections, SWMP availability, and procedures for covering additional projects.

**Response:** The Mine Remediation permit has been written as an individual permit instead of a general permit, and must be amended to include any additional MRP's or modify MRP's. Also, this Mine Remediation Permit was intended to cover more than just stormwater discharges. Because of these differences, the suggested changes were determined by the Division to be inappropriate.

- 4) **Comment:** For those projects where adits are present, requirements related to adit closure or treatment should be added

**Response:** In those cases where adits are present, the receiving streams have been classified such that there is no need for treatment of adit flows, provided the activities of the permittee do not increase the loading of pollutants from such discharges. In all cases, the permittee has submitted MRP's that either will not affect adit discharges, or will reduce or eliminate pollutant the loading of pollutants being discharged.

Rich Horstmann  
May 2, 1996

Permit No.: CO-0044768

County: San Juan

## **AUTHORIZATION TO DISCHARGE UNDER THE**

### **COLORADO DISCHARGE PERMIT SYSTEM**

In compliance with the provisions of the Colorado Water Quality Control Act, (25-8-101 et seq., CRS, 1973 as amended) and the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq.; the "Act") the

#### **SUNNYSIDE GOLD CORPORATION**

is authorized, when certified by the Water Quality Control Division, to discharge from

#### **Mine Remediation Projects**

#### **With No Residual Discharge Following Project Completion**

located within the **upper Animas River basin**, as listed in this permit, into with the State Water Quality Control Division, and in accordance with effluent limitations, monitoring requirements and other conditions set forth in Part I and II hereof. All discharges authorized herein shall be consistent with the terms and conditions of this permit.

The applicant may demand an adjudicatory hearing within thirty (30) days of the issuance of the final permit determination, per the Regulations for the State Discharge Permit System, 6.8.0 (1). Should the applicant choose to contest any of the effluent limitations, monitoring requirements or other conditions contained herein, the applicant must comply with Section 24-4-104 CRS and the Regulations for the State Discharge Permit System. Failure to contest any such effluent limitation, monitoring requirement, or other condition, constitutes consent to the condition by the Applicant.

This permit and the authorization to discharge shall expire at midnight, **May 31, 2001**.

Issued and Signed this <sup>6<sup>th</sup></sup> day of *May*, 1996

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

*David Holm*  
J. David Holm, Director  
Water Quality Control Division

Permit No. CO-0044768  
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**PART I**

**A. TERMS AND CONDITIONS**

**1. Authorization to Discharge**

Beginning no later than the effective date of this general permit and lasting through **May 31, 2001**, the permittee is authorized to discharge from mine waste remediation projects with no residual discharge following project completion. The specific locations and outfalls associated with these projects are described in the attachments to this permit, according to the following listing:

Mine Remediation Project	Attachment Abbreviation	Number of Pages
American Tunnel Mine Waste Dump	AT	8
Boulder Creek Tailings Project	BC	7
Columbus Mine Portals Mine Waste Dumps	CM	8
Surface Mill Tailings at Eureka	ET	7
Gold Prince Mill Tailings	GP	10
Longfellow Koehler Mine Waste Project	LK	14
London Mine Portals Waste Dumps	LM	8
Pride of the West Tailings	PW	8
Sunnyside Mine Pool Mitigation - Alkaline Solution Injection	SP	6

**2. Mine Remediation Plan (MRP) - Definition, Development**

A Mine Remediation Plan (MRP) has been developed for each of the sites listed above. Similar plans shall be developed for any additional site that is later desired by the permittee to be covered by this permit. The MRP shall be prepared in accordance with good engineering practices. (The plan need not be completed by a registered engineer.) The plan shall identify potential sources of pollution (including sediment) which may reasonably be expected to affect the quality of discharges associated with the mining operation. In addition, the plan shall describe and ensure the implementation of best management practices (BMPs) which will be used to reduce the pollutants in discharges associated with the inactive mining operation.

The MRP's that have already been submitted include, and any future ones will have to include, the following items, at a minimum:

**a. Description of Mining Activities**

To the extent that the permittee is knowledgeable, the plan shall provide a narrative description of the mining and associated activities that took place at the site. The narrative description shall report the approximate dates of operation, the total acreage within the mine site and an estimate of the number of acres of disturbed area. A general description of the location of the mining site relative to major transportation routes and communities shall also be provided.

b. **Site Map**

Each plan shall provide a generalized site map or maps indicating all of the following, where applicable:

- mining/milling site boundaries and access and haul roads;
- areas used for storage of overburden, materials, soils, tailings or wastes;
- areas used for outdoor manufacturing, storage or disposal of materials;
- tailings piles and ponds;
- an estimate of the direction(s) of flow;
- existing structural control measures to reduce pollutants in stormwater runoff; and
- springs, streams, wetlands and other surface waters.

c. **Stormwater Management Controls - Identification of Sources and Best Management Practices During Progress of Remedial Action**

The MRP shall identify potential sources of pollutants at the site and assess the potential of these sources to contribute pollutants to stormwater discharges during the progress of the remedial action. The MRP must also describe appropriate Best Management Practices (BMPs) to reduce the potential of these sources to contribute pollutants to stormwater discharges. The appropriateness and priorities of controls in the plan shall reflect identified potential sources of pollutants at the mining site. The description of the BMPs shall include:

- i. **Stormwater diversion:** Describe how and where stormwater will be diverted away from potential pollutant sources to prevent stormwater contamination.
- ii. **Sediment and erosion prevention:** Describe practices that will be used to reduce erosion and prevent sediment delivery to State waters. These could include structural (such as silt fences, sediment ponds, drop structures, check dams) and non-structural (such as mulching and revegetation) methods.

d. **Comprehensive Inspection and Record Keeping Procedures**

The MRP shall identify qualified personnel that shall inspect designated areas. The Division will at any time have the right to inspect a remediation site after remediation work has begun, or the property owner has granted permission to the Division to enter the property. Upon request by the permittee, the Division will request that the State Division of Minerals and Geology (DMG) inspect any of the mitigation projects to determine whether the reclamation work has been completed in accordance with the reclamation standards of DMG and the MRPs.

e. **Additional MRP Items**

- i. **Legal Right to Enter Property:** Prior to beginning on-site work for any remediation project, the permittee must submit documentation to the Water Quality Control Division showing that the permittee has been granted permission to enter the property(ies) where work will be carried out. If possible, such documentation should be included in the MRP for a site.
- ii. **Photographs:** The plan should include photographs documenting the condition of the inactive mine site before any remedial action has occurred. If not included in the plan, such photographs must be submitted as part of the first regular monitoring report submitted for a site.

- iii). **Description of Remedial Action:** The plan shall describe the remedial action that will take place to minimize or eliminate the water quality impacts from the mine waste. The description shall include:
  - Remediation Goal Statement;
  - the characteristics of the mineralogic content of the mine-waste, and volume of the waste;
  - description of any materials that will be mixed into the mine waste on site; and
  - estimated volume and surface area of the final site, and estimated angle of side slopes.
- iv). **Discharges Other Than Stormwater:** For discharges other than stormwater, such as water ponded on a mine site or encountered within mine waste, such discharges must be treated or controlled such that the loading to the receiving stream is no greater than that which was occurring prior to commencement of the remedial action.
- v). **Description of permanent BMPs, final site stabilization, and potential land use:** The plan shall include a description of the specific measures that will be installed or used at the mine-waste site. The description shall include any of the following if appropriate: specifications for capping or isolation of the mine-waste, method and type of revegetation, and other permanent BMPs. The plan shall also include a description of the potential land use after remediation is complete.

f. **Consistency with Other Plans**

MRPs may reflect requirements for Spill Prevention Control and Countermeasure (SPCC) plans under section 311 of the CWA, or Best Management Practices (BMPs) Programs otherwise required by a CDPS permit, and may incorporate any part of such plans into the MRP by reference. The MRP may rely upon information contained in approved plans submitted for other similar pollution control programs, including the Voluntary Clean Up Program. (Voluntary Cleanup and Redevelopment Act, CRS 25-16-303).

3. **Implementation of Mine Remediation Plan**

Upon beginning remediation work at a site The permittee is required to fully implement the Mine Remediation Plan (MRP) for each project that is described in the attachments to this permit.

4. **Oil and Grease, and Floating Solids Monitoring and Control**

In the event an oil sheen or floating oil, or floating solids, are observed in any discharge from a mine waste remediation site, all practicable measures must be taken in order to identify and eliminate the source of the sheen or floating solids.

5. **Monitoring and Reporting**

The permittee is required to perform whatever oversight is necessary to insure that the MRP is being implemented, and shall comply with all monitoring and reporting conditions included in the MRP. At a minimum, monthly reports are required for any water quality data that is collected as part of a MRP. In addition, quarterly reports must be submitted which include: 1) a narrative description of the current status of the remediation project, 2) a summary of analytical results for any sampling that was specified in the MRP for the site in question, 3) a photographic survey of the sites (both pre-remediation waste location and post-remediation waste location) involved in the remediation action. Reports must be received by the 28th day of the month following the calendar quarter or month for which the report is being submitted

B. **SPECIAL REQUIREMENTS**

1. **Materials Containment**

Any hazardous materials or chemicals permanently stored or used on site (including fuels, lubricants, hazardous soil amendment materials and hazardous fertilizers) shall be adequately handled and contained to prevent any spills from occurring. Earthen dikes or concrete basins with capacity to hold contents of storage tanks or containers shall be used to prevent spills of these materials into State Waters in the event of failure of the storage containers.

## C. GENERAL MONITORING, SAMPLING AND REPORTING REQUIREMENTS

### 1. Routine Reporting

Reports submitted in compliance with the terms and conditions of this permit shall be submitted on a quarterly basis, except for water quality data, which shall be submitted on a monthly basis, and shall be mailed to the agencies listed below so they are received no later than the 28th day of the month following the end of each calendar quarter, or, for monthly reports, the no later than the 28th day of the month following the month for which the report is being submitted.

The original signed copy of each report shall be submitted to the Division at the following address:

Colorado Department of Public Health and Environment  
WQCD-PE-B2  
4300 Cherry Creek Drive South  
Denver, Colorado 80222-1530

A duplicate signed copy of each monitoring report shall be submitted to the following agency:

U.S. Environmental Protection Agency (8ENF-T)  
Office of Enforcement, Compliance Assistance and Environmental Justice  
Technical Enforcement Program  
999 18th Street, Suite 500  
Denver, CO 80202-2466

### 2. Representative Sampling

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. All samples shall be taken at the monitoring points specified in this permit and, unless otherwise specified, before the effluent joins or is diluted by any other wastestream, body of water, or substance. Monitoring points shall not be changed without notification to and approval by the Division.

If the permittee monitors at the point of discharge any pollutant limited by the permit more frequently than required by the permit, using approved test procedures or as specified in the permit, the result of this monitoring shall be included in the calculation and reporting of data to the Division.

### 3. Analytical and Sampling Methods for Monitoring

The permittee shall install, calibrate, use and maintain monitoring methods and equipment, including biological and indicated pollutant monitoring methods. All sampling shall be performed by the permittee according to specified methods in 40 C.F.R. Part 136; methods approved by EPA pursuant to 40 C.F.R. Part 136; or methods approved by the Division, in the absence of a method specified in or approved pursuant to 40 C.F.R. part 136. **The analytical method selected for a parameter shall be the one that can measure the lowest detected limit for that parameter unless the permit limitation or stream standard for those parameters not limited, is within the testing range of another approved method.** When requested in writing, the Division may approve an alternative analytical procedure or any significant modification to an approved procedure.

When the most sensitive analytical method which complies with this part, has a detection limit greater than or equal to the permit limit, the permittee shall report "less than (the detectable limit)," as appropriate. Such reports shall not be considered as violations of the permit limit.

The present lowest method detection limits for specific parameters (which have limitations which are, in some cases, less than or equal to the detection limit) are as follows:

Arsenic	0.01 mg/l
Benzene	0.001 mg/l
Total Residual Chlorine	0.05 mg/l
Cadmium	0.001 mg/l
Chromium	0.01 mg/l
Chromium, Hexavalent	0.01 mg/l
Copper	0.005 mg/l
Lead	0.005 mg/l
Total Mercury	0.00025 mg/l
Nickel	0.05 mg/l
Selenium	0.01 mg/l
Silver	0.0002 mg/l
Zinc	0.01 mg/l

These limits apply to the total recoverable or the potentially dissolved fraction of metals.

For hexavalent chromium, samples must be unacidified so that dissolved concentrations will be measured rather than potentially dissolved concentrations. Procedure for determining settleable solids is contained in 40 CFR 434.64. The method detection limit for measuring settleable solids under this part shall be 0.4 ml/l.

#### 4. Records

The permittee shall establish and maintain records. Those records shall include the following:

- a. The date, type, exact location, and time of sampling or measurements;
- b. The individual(s) who performed the sampling or measurements;
- c. The date(s) the analyses were performed;
- d. The individual(s) who performed the analyses;
- e. The analytical techniques or methods used;
- f. The results of such analyses; and
- g. Any other observations which may result in an impact on the quality or quantity of the discharge as indicated in 40 CFR 122.44 (I)(1)(iii).

The permittee shall retain for a minimum of three (3) years records of all monitoring information, including all original strip chart recordings for continuous monitoring instrumentation, all calibration and maintenance records, copies of all reports required by this permit and records of all data used to complete the application for this permit. This period of retention shall be extended during the course of any unresolved litigation regarding the discharge of pollutants by the permittee or when requested by the Division or EPA.

#### 5. Signatory and Certification Requirements

- a. All reports and other information required by the Division, shall be signed and certified for accuracy by the permittee in accord with the following criteria:
  - (1) In the case of corporations, by a principal executive officer of at least the level of vice-president or his or her duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge described in the form originates;
  - (2) In the case of a partnership, by a general partner;
  - (3) In the case of a sole proprietorship, by the proprietor;



- (4) In the case of a municipal, state, or other public facility, by either a principal executive officer, ranking elected official, or other duly authorized employee.
- b. All reports required by permits, and other information requested by the Division shall be signed by a person as described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:
  - (1) The authorization is made in writing by a person described above;
  - (2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and,
  - (3) The written authorization is submitted to the Division.

If an authorization as described in this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of this section must be submitted to the Division prior to or together with any reports, information, or applications to be signed by an authorized representative.

The permittee, or the duly authorized representative shall make and sign the following certification on all such documents:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

## A. NOTIFICATION REQUIREMENTS

### 1. Notification to Parties

All notification requirements under this section shall be directed as follows:

- a. Oral Notifications, other than for spills, during normal business hours shall be to:

Permits and Enforcement Section  
Water Quality Control Division  
Telephone : (303) 692-3590

Spills notifications at any time and other notifications after hours shall be to :

Emergency Response Unit  
Office of the Environment  
Telephone No.: (303)-756-4455

- b. Written notification shall be to:

Industrial Permits and Enforcement Program  
Colorado Department of Public Health and Environment  
WQCD-PE-B2  
4300 Cherry Creek Drive South  
Denver, Colorado 80222

### 2. Change in Discharge

The permittee shall notify the Division, in writing, of any planned physical alterations or additions to the permitted facility. Notice is required only when:

- a. The alteration or addition could significantly change the nature or increase the quantity or pollutants discharged; or
- b. The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported pursuant to an approved land application plan.

The permittee shall give advance notice to the Division of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

Whenever notification of any planned physical alterations or additions to the permitted facility is required pursuant to this section, the permittee shall furnish the Division such plans and specifications which the Division deems reasonably necessary to evaluate the effect on the discharge, the stream, or ground water. - If the Division finds that such new or altered discharge might be inconsistent with the conditions of the permit, the Division shall require a new or revised permit application and shall follow the procedures specified in Sections 6.6.0 through 6.7.0, and 6.16.0 of the Regulations for the State Discharge Permit System.

3. **Special Notifications - Definitions**

- a. Bypass: The intentional diversion of waste streams from any portion of a treatment facility.
- b. Severe Property Damage: Substantial physical damage to property at the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. It does not mean economic loss caused by delays in production.
- c. Spill: An incident in which flows or solid materials are accidentally or unintentionally allowed to flow or escape so as to be lost from the treatment, processing or manufacturing system which may cause or threaten pollution of state waters.
- d. Upset: An exceptional incident in which there is unintentional and temporary noncompliance with permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

4. **Noncompliance Notification**

- a. If, for any reason, the permittee does not comply with or will be unable to comply with any discharge limitations or standards specified in this permit, the permittee shall, at a minimum, provide the Division and EPA with the following information:
  - (1) A description of the discharge and cause of noncompliance;
  - (2) The period of noncompliance, including exact dates and times and/or the anticipated time when the discharge will return to compliance; and
  - (3) Steps being taken to reduce, eliminate, and prevent recurrence of the noncomplying discharge.
- b. The permittee shall report the following circumstances **orally within twenty-four (24) hours** from the time the permittee becomes aware of the circumstances, and shall mail to the Division a written report containing the information requested in Part II.A.3 (a) **within five (5) days** after becoming aware of the following circumstances:
  - (1) Circumstances leading to any noncompliance which may endanger health or the environment regardless of the cause of the incident;
  - (2) Circumstances leading to any unanticipated bypass which exceeds any effluent limitations in the permit;
  - (3) Circumstances leading to any upset or spill which causes an exceedance of any effluent limitation in the permit;
  - (4) Daily maximum violations for any of the pollutants limited by PART I.A of this permit and specified as requiring 24 hour notification. This includes any toxic pollutant or hazardous substance or any pollutant specifically identified as the method to control any toxic pollutant or hazardous substance.
- c. The permittee shall report instances of non-compliance which are not required to be reported within 24-hours at the time Discharge Monitoring Reports are submitted. The reports shall contain the information listed in sub-paragraph (a) of this section.

5. **Other Notification Requirements**

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule in the permit shall be submitted no later than fourteen (14) days following each scheduled date, unless otherwise provided by the Division.

The permittee shall notify the Division, in writing, thirty (30) days in advance of a proposed transfer of permit as provided in Part II.B.3. The permittee's notification of all anticipated noncompliance does not stay any permit condition.

6. **Bypass Notification**

If the permittee knows in advance of the need for a bypass, a notice shall be submitted, at least ten days before the date of the bypass, to the Division. The bypass shall be subject to Division approval and limitations imposed by the Division. Violations of requirements imposed by the Division will constitute a violation of this permit.

7. **Upsets**

a. **Effect of an Upset**

An upset constitutes an affirmative defense to an action brought for noncompliance with permit effluent limitations if the requirements of paragraph (b) of this section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

b. **Conditions Necessary for a Demonstration of Upset**

A permittee who wishes to establish the affirmative defense of upset shall demonstrate through properly signed contemporaneous operating logs, or other relevant evidence that:

- (1) An upset occurred and that the permittee can identify the specific cause(s) of the upset; and
- (2) The permitted facility was at the time being properly operated and maintained; and
- (3) The permittee submitted proper notice of the upset as required in Part II.A.4. of this permit (24-hour notice); and
- (4) The permittee complied with any remedial measure necessary to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

In addition to the demonstration required above, a permittee who wishes to establish the affirmative defense of upset for a violation of effluent limitations based upon water quality standards shall also demonstrate through monitoring, modeling or other methods that the relevant standards were achieved in the receiving water.

c. **Burden of Proof**

In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

8. **Discharge Point**

Any discharge to the waters of the State from a point source other than specifically authorized by this permit is prohibited.

9. **Proper Operation and Maintenance**

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee as necessary to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by the permittee only when necessary to achieve compliance with the conditions of the permit.

10. **Minimization of Adverse Impact**

The permittee shall take all reasonable steps to minimize or prevent any discharge of sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment. As necessary, accelerated or additional monitoring to determine the nature and impact of the noncomplying discharge is required.

**11. Removed Substances**

Solids, sludges, or other pollutants removed in the course of treatment or control of wastewaters shall be disposed in accordance with applicable state and federal regulations.

For all domestic wastewater treatment works, at industrial facilities, the permittee shall dispose of sludge in accordance with all State and Federal regulations.

**12. Submission of Incorrect or Incomplete Information**

Where the permittee failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or report to the Division, the permittee shall promptly submit the relevant information which was not submitted or any additional information needed to correct any erroneous information previously submitted

**13. Bypass**

a. Bypasses are prohibited and the Division may take enforcement action against the permittee for bypass, unless:

- (1) The bypass is unavoidable to prevent loss of life, personal injury, or severe property damage;
- (2) There were no feasible alternatives to bypass such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
- (3) Proper notices were submitted in compliance with Part II.A.4.

b. "Severe property damage" as used in this Subsection means substantial physical damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

c. The permittee may allow a bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance or to assure optimal operation. These bypasses are not subject to the provisions of paragraph (a) above.

d. The Division may approve an anticipated bypass, after considering adverse effects, if the Division determines that the bypass will meet the conditions specified in paragraph (a) above.

**14. Reduction, Loss, or Failure of Treatment Facility**

The permittee has the duty to halt or reduce any activity if necessary to maintain compliance with the effluent limitations of the permit. Upon reduction, loss, or failure of the treatment facility, the permittee shall, to the extent necessary to maintain compliance with its permit, control production, control sources of wastewater, or all discharges, until the facility is restored or an alternative method of treatment is provided. This provision also applies to power failures, unless an alternative power source sufficient to operate the wastewater control facilities is provided.

It shall not be a defense for a permittee in an enforcement action that it would be necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

**B. RESPONSIBILITIES**

**1. Inspections and Right to Entry**

The permittee shall allow the Division and/or the authorized representative, upon the presentation of credentials:

- a. To enter upon the permittee's premises where a regulated facility or activity is located or in which any records are required to be kept under the terms and conditions of this permit;
- b. At reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit and to inspect any monitoring equipment or monitoring method required in the permit; and
- c. To enter upon the permittee's premises in a reasonable manner and at a reasonable time to inspect and/or investigate, any actual, suspected, or potential source of water pollution, or to ascertain compliance or non compliance with the Colorado Water Quality Control Act or any other applicable state or federal statute or regulation or any order promulgated by the Division. The investigation may include, but is not limited to, the following: sampling of any discharge and/or process waters, the taking of photographs, interviewing of any person having knowledge related to the discharge permit or alleged violation, access to any and all facilities or areas within the permittee's premises that may have any affect on the discharge, permit, or alleged violation. Such entry is also authorized for the purpose of inspecting and copying records required to be kept concerning any effluent source.
- d. The permittee shall provide access to the Division to sample the discharge at a point after the final treatment process but prior to the discharge mixing with state waters upon presentation of proper credentials.

In the making of such inspections, investigations, and determinations, the Division, insofar as practicable, may designate as its authorized representatives any qualified personnel of the Department of Agriculture. The Division may also request assistance from any other state or local agency or institution.

## **2. Duty to Provide Information**

The permittee shall furnish to the Division, within a reasonable time, any information which the Division may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Division, upon request, copies of records required to be kept by this permit.

## **3. Transfer of Ownership or Control**

- a. Except as provided in paragraph b. of this section, a permit may be transferred by a permittee only if the permit has been modified or revoked and reissued as provided in Section 6.9.8 of the Regulations for the State Discharge Permit System, to identify the new permittee and to incorporate such other requirements as may be necessary under the Federal Act.
- b. A permit may be automatically transferred to a new permittee if:
  - (1) The current permittee notifies the Division in writing 30 days in advance of the proposed transfer date; and
  - (2) The notice includes a written agreement between the existing and new permittee(s) containing a specific date for transfer of permit responsibility, coverage and liability between them; and
  - (3) The Division does not notify the existing permittee and the proposed new permittee of its intent to modify, or revoke and reissue the permit.
- (4) Fee requirements of the Regulations for the State Discharge Permit System, Section 6.16.0 have been met.

## **4. Availability of Reports**

Except for data determined to be confidential under Section 308 of the Federal Clean Water Act and Regulations for the State Discharge Permit System 5 CCR 1002-2, 6.6.4, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Division and the Environmental Protection Agency.

The name and address of the permit applicant(s) and permittee(s), permit applications, permits and effluent data shall not be considered confidential. Knowingly making false statement on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the Federal Clean Water Act, and Section 25-8-610 C.R.S.

5. **Modification, Suspension, Revocation, or Termination of Permits By the Division**

The filing of a request by the permittee for a permit modification, revocation and reissuance, termination or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

- a. A permit may be modified, suspended, or terminated in whole or in part during its term for reasons determined by the Division including, but not limited to, the following:
  - (1) Violation of any terms or conditions of the permit;
  - (2) Obtaining a permit by misrepresentation or failing to disclose any fact which is material to the granting or denial of a permit or to the establishment of terms or conditions of the permit; or
  - (3) Materially false or inaccurate statements or information in the permit application or the permit.
  - (4) A determination that the permitted activity endangers human health or the classified or existing uses of state waters and can only be regulated to acceptable levels by permit modifications or termination.
- b. A permit may be modified in whole or in part for the following causes, provided that such modification complies with the provisions of Section 6.11.0 of the Regulations for the State Discharge Permit System:
  - (1) There are material and substantial alterations or additions to the permitted facility or activity which occurred after permit issuance which justify the application of permit conditions that are different or absent in the existing permit.
  - (2) The Division has received new information which was not available at the time of permit issuance (other than revised regulations, guidance, or test methods) and which would have justified the application of different permit conditions at the time of issuance. For permits issued to new sources or new dischargers, this cause includes information derived from effluent testing required under Section 6.5.7(5) of the Regulations for the State Discharge Permit System. This provision allows a modification of the permit to include conditions that are less stringent than the existing permit only to the extent allowed under Section 6.11.0 of the Regulations for the State Discharge Permit System.
  - (3) The standards or regulations on which the permit was based have been changed by promulgation of amended standards or regulations or by judicial decision after the permit was issued. Permits may be modified during their terms for this cause only as follows:
    - (a) The permit condition requested to be modified was based on a promulgated effluent limitation guideline, EPA approved water quality standard, or an effluent limitation set forth in 5 CCR 1002-3, § 10.1.0 et seq.; and
    - (b) EPA has revised, withdrawn, or modified that portion of the regulation or effluent limitation guideline on which the permit condition was based, or has approved a Commission action with respect to the water quality standard or effluent limitation on which the permit condition was based; and
    - (c) The permittee requests modification after the notice of final action by which the EPA effluent limitation guideline, water quality standard, or effluent limitation is revised, withdrawn, or modified; or
    - (d) For judicial decisions, a court of competent jurisdiction has remanded and stayed EPA promulgated regulations or effluent limitation guidelines, if the remand and stay concern that portion of the regulations or guidelines on which the permit condition was based and a request is filed by the permittee in accordance with this Regulation, within ninety (90) days of judicial remand.
  - (4) The Division determines that good cause exists to modify a permit condition because of events over which the permittee has no control and for which there is no reasonable available remedy.
  - (5) The permittee has received a variance.

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- (6) When required to incorporate applicable toxic effluent limitation or standards adopted pursuant to § 307(a) of the Federal act.
  - (7) When required by the reopener conditions in the permit.
  - (8) As necessary under 40 C.F.R. 403.8(e), to include a compliance schedule for the development of a pretreatment program.
  - (9) When the level of discharge of any pollutant which is not limited in the permit exceeds the level which can be achieved by the technology-based treatment requirements appropriate to the permittee under Section 6.9.2(1) of the Regulations for the State Discharge Permit System.
  - (10) To establish a pollutant notification level required in Section 6.9.5 of the Regulations for the State Discharge Permit System.
  - (11) To correct technical mistakes, such as errors in calculation, or mistaken interpretations of law made in determining permit conditions, to the extent allowed in Section 6.11.0 of the Regulations for the State Discharge Permit System.
  - (12) When required by a permit condition to incorporate a land application plan for beneficial reuse of sewage sludge, to revise an existing land application plan, or to add a land application plan.
  - (13) For any other cause provided in Section 6.11.0 of the Regulations for the State Discharge Permit System.
- c. At the request of a permittee, the Division may modify or terminate a permit and issue a new permit if the following conditions are met:
- (1) The Regional Administrator has been notified of the proposed modification or termination and does not object in writing within thirty (30) days of receipt of notification,
  - (2) The Division finds that the permittee has shown reasonable grounds consistent with the Federal and State statutes and regulations for such modifications or termination;
  - (3) Requirements of Section 6.16.0 of the Regulations for the State Discharge Permit System have been met, and
  - (4) Requirements of public notice have been met.
- d. Permit modification (except for minor modifications), termination or revocation and reissuance actions shall be subject to the requirements of Sections 6.6.2, 6.6.3, 6.7.0, 6.8.0 and 6.16.0 of the Regulations for the State Discharge Permit System. The Division shall act on a permit modification request, other than minor modifications requests, within 180 days of receipt thereof. Except for minor modifications, the terms of the existing permit govern and are enforceable until the newly issued permit is formally modified or revoked and reissued following public notice.
- e. Upon consent by the permittee, the Division may make minor permit modifications without following the requirements of Sections 6.6.2, 6.6.3, 6.8.0, and 6.16.0 of the Regulations for the State Discharge Permit System. Minor modifications to permits are limited to:
- (1) Correcting typographical errors; or
  - (2) Increasing the frequency of monitoring or reporting by the permittee; or
  - (3) Changing an interim date in a schedule of compliance, provided the new date of compliance is not more than 120 days after the date specific in the existing permit and does not interfere with attainment of the final compliance date requirement; or



- (4) Allowing for a transfer in ownership or operational control of a facility where the Division determines that no other change in the permit is necessary, provided that a written agreement containing a specific date for transfer of permit responsibility, coverage and liability between the current and new permittees has been submitted to the Division; or
  - (5) Changing the construction schedule for a discharger which is a new source, but no such change shall affect a discharger's obligation to have all pollution control equipment installed and in operation prior to discharge; or
  - (6) Deleting a point source outfall when the discharge from that outfall is terminated and does not result in discharge of pollutants from other outfalls except in accordance with permit limits.
- f. When a permit is modified, only the conditions subject to modification are reopened. If a permit is revoked and reissued, the entire permit is reopened and subject to revision and the permit is reissued for a new term.
- g. The filing of a request by the permittee for a permit modification, revocation and reissuance or termination does not stay any permit condition.
- h. All permit modifications and reissuances are subject to the antbacksliding provisions set forth in 6.11.0 (5) through (9).

**6. Oil and Hazardous Substance Liability**

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject to under Section 311 (Oil and Hazardous Substance Liability) of the Clean Water Act.

**7. State Laws**

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority granted by Section 510 of the Clean Water Act.

**8. Permit Violations**

Failure to comply with any terms and/or conditions of this permit shall be a violation of this permit. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of the permit.

**9. Property Rights**

The issuance of this permit does not convey any property or water rights in either real or personal property, or stream flows, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

**10. Severability**

The provisions of this permit are severable. If any provisions of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances and the application of the remainder of this permit shall not be affected.

**11. Renewal Application**

If the permittee desires to continue to discharge, a permit renewal application shall be submitted at least one hundred eighty (180) days before this permit expires. If the permittee anticipates there will be no discharge after the expiration date of this permit, the Division should be promptly notified so that it can terminate the permit in accordance with Part II.B.5.

**12. Confidentiality**

Any information relating to any secret process, method of manufacture or production, or sales or marketing data which has been declared confidential by the permittee, and which may be acquired, ascertained, or discovered, whether in any sampling investigation, emergency investigation, or otherwise, shall not be publicly disclosed by any member, officer, or employee of the Commission or the Division, but shall be kept confidential. Any person seeking to invoke the protection of this Subsection (12) shall bear the burden of proving its applicability. This section shall never be interpreted as preventing full disclosure of effluent data.

**13. Fees**

The permittee is required to submit payment of an annual fee as set forth in the 1983 amendments to the Water Quality Control Act. Section 25-8-502 (1) (b), and State Discharge Permit Regulations 5 CCR 1002-2, Section 6.16.0 as amended. Failure to submit the required fee when due and payable is a violation of the permit and will result in enforcement action pursuant to Section 25-8-601 et. seq., C.R.S. 1973 as amended.

**14. Duration of Permit**

The duration of a permit shall be for a fixed term and shall not exceed five (5) years. Filing of a timely and complete application shall cause the expired permit to continue in force to the effective date of the new permit. The permit's duration may be extended only through administrative extensions and not through interim modifications.

**15. Section 307 Toxics**

If a toxic effluent standard or prohibition, including any applicable schedule of compliance specified, is established by regulation pursuant to Section 307 of the Federal Act for a toxic pollutant which is present in the permittee's discharge and such standard or prohibition is more stringent than any limitation upon such pollutant in the discharge permit, the Division shall institute proceedings to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition.

**16. Antibacksliding**

- a. A permit may not be renewed, reissued, or modified to contain effluent limitations adopted pursuant to Section 25-8-503(1)(b) (BPJ) of the Water Quality Control Act, which are less stringent than the comparable effluent limitations or standards in the previous permit, unless any one of the following exceptions is met and the conditions of paragraph (c) of this section are met:
- (1) Material and substantial alterations or additions to the permitted facility occurred after permit issuance which justify the application of less stringent effluent limitations; or
  - (2) Information is available which was not available at the time of permit issuance (other than revised regulations, guidance, or test methods) and which would have justified the application of a less stringent effluent limitation or standard at the time of permit issuance; or
  - (3) The Division determines that technical mistakes or mistaken interpretations of law were made in issuing the permit, which justified relaxation of the effluent limitations or standards; or
  - (4) A less stringent effluent limitation or standard is necessary because of events over which the permittee has no control and for which there is not reasonable available remedy; or
  - (5) The permittee has received a permit variance; or
  - (6) The permittee has installed the treatment facilities required to meet the effluent limitations in the previous permit and has properly operated and maintained the facilities but has nevertheless been unable to achieve the previous effluent limitations, in which case, the limitations in the renewed, reissued, or modified permit may reflect the level of pollutant control actually achieved (but shall not be less stringent than required by effluent guidelines in effect at the time of permit renewal, reissuance, or modification).

- b. A permit may not be renewed, reissued, or modified to contain effluent limitations adopted pursuant to 6.9.2(2) or (3) or the Regulations for the State Discharge Permit System that are less stringent than the comparable effluent limitations in the previous permit, unless any of the exceptions provided herein is met and the conditions of paragraph (c) of this section are met.
- (1) In waters where the applicable water quality standard has not yet been attained, effluent limitations based on a total maximum daily load or other waste load allocation may be revised to be less stringent if the cumulative effect of all such revisions assures attainment of such water quality standard, or the designated use which is not being attained is removed in accordance with Section 3.1.6 of the Basic Standards.
  - (2) In waters where the applicable water quality standard has been attained, effluent limitations based on a total maximum daily load, other waste load allocation, or any other permitting standard (including any water quality standard) may be revised to be less stringent if such revision is subject to and consistent with the antidegradation provisions of Section 3.1.8 of the Basic Standards. Consistency with Section 3.1.8 shall be presumed if the waters in question have been designated by the Commission as "use protected"; or
  - (3) Whether or not the applicable water quality standard has been attained:
    - (a) Material and substantial alterations or additions to the permitted facility occurred after permit issuance which justified the application of less stringent effluent limitations; or
    - (b) A less stringent effluent limitation is necessary because of events over which the permittee has no control and for which there is not reasonable available remedy; or
    - (c) The permittee has received a permit variance; or
    - (d) The permittee has installed the treatment facilities required to meet the effluent limitations in the previous permit and has properly operated and maintained the facilities but has nevertheless been unable to achieve the previous effluent limitations, in which case, the limitations in the reviewed, reissued, or modified permit may reflect the level of pollutant control actually achieved (but shall not be less stringent than required by effluent guidelines in effect at the time of permit renewal, reissuance, or modification).
- c. In no event may a permit with respect to which paragraphs (a) and (b) of this section apply be renewed, reissued, or modified to contain an effluent limitation or standard which is less stringent than required by federal effluent guidelines in effect at the time the permit is renewed, reissued, or modified. In no event may such a permit to discharge into state waters be renewed, reissued, or modified to contain a less stringent effluent limitation if the implementation of such limitation would result in a violation of an applicable water quality standard.

#### **17. Effect of Permit Issuance**

- a. The issuance of a permit does not convey any property rights or any exclusive privilege.
- b. The issuance of a permit does not authorize any injury to person or property or any invasion of personal rights, nor does it authorize the infringement of federal, state, or local laws or regulations.
- c. Except for any toxic effluent standard or prohibition imposed under Section 307 of the Federal act or any standard for sewage sludge use or disposal under Section 405(d) of the Federal act, compliance with a permit during its term constitutes compliance, for purposes of enforcement, with Sections 301, 302, 306, 318, 403, and 405(a) and (b) of the Federal act. However, a permit may be modified, revoked and reissued, or terminated during its term for cause as set forth in Section 6.9.8 of the Regulations for the State Discharge Permit System.
- d. Compliance with a permit condition which implements a particular standard for sewage sludge use or disposal shall be an affirmative defense in any enforcement action brought for a violation of that standard for sewage sludge use or disposal.

Mine Remediation Plan: American Tunnel Mine Waste Dump

Remediating Party: Sunnyside Gold Corporation  
P.O. Box 177  
Silverton, CO 81433

contact William B. Goodhard  
Resident Manager

**1. Description of Mining Activities**

**Physical Description of Conditions**

The mine waste dump and underlying tailings, located on the north side of the South Fork of Cement Creek, was estimated to total approximately 80,000 cubic yards prior to 1994 removal work. The dump was comprised of waste generated during the mining at Sunnyside and underlying the waste dump was an old historic tailings pond from another facility. Due to the proximity to the creek and groundwater, SGC believes that the underlying tailings removal and the removal of mine waste material and protection from percolation of rain and snow waters was the best remediation technique. This project was an unanticipated extension of the tailings removal action near the American Tunnel, first begun in 1991, on the south side of the South Fork of Cement Creek. See attached pre project monitoring and site characterization information.

**General Description of the Mining Site**

The Mine Waste Dump Site was located at the American Tunnel 7.2 miles north of Silverton on Colorado State Highway 110. Total acreage of disturbance was 3.64 acres prior to project implementation. See the attached map.

**Identification of Lands**

Surface waste dump at the American Tunnel site of Sunnyside Gold Corporation (SGC). Lands are included within Mined Land Reclamation Permit #M-77-378 boundary. Lands are included in SGC's Stormwater Permit #COR-040052 identified as American Tunnel. Lands are located at Gladstone, San Juan County, Colorado. See attached map and site map.

Latitude 37 degrees 53 minutes      Longitude 107 degrees 39 minutes

**Identification of the Waters of the United States Potentially Affected**

South Fork of Cement Creek above the confluence with Cement Creek. Cement Creek flows into the Animas River at Silverton Colorado. See attached map.

**2. Site Map**  
Attached

**3. Stormwater Management Controls**

Necessary Stormwater Management Controls were improved or installed as a part task of this project. The controls consisted of catchments built of hay bales along potential flow paths to catch any sediments.

**4. Inspection and Record Keeping Procedures**

The Manager or a member of the Technical Service Department inspected this project during removal and revegetation. Ongoing inspections and reporting will continue. Reports will be sent to both the Colorado Division of Minerals and Geology and the Water Quality Control Division.

## 5. Mine Remediation Plan

### Legal Right to Enter and Conduct Activities

This project falls within the boundaries of SGC's MLR permit area. It includes lands that are privately owned and controlled by SGC through ownership or historic easements. This Project is also permitted through Water Quality Control Division by Stormwater Permit # COR-040052.

### Remedial Goals and Objectives

Continue to improve both reclamation plan and stormwater management plan to minimize impacts to Cement Creek.

### Site Loading Estimate

For all of the remediation projects, and based on limited information, the site loading estimate for each project site was based on the following methodology:

#### Adits-

Using available data, zinc loading was calculated based on the average flow and average zinc values.

#### Mine Waste Dumps and Tailings Piles-

Site composite soil samples were tested using a water bath extraction. This test consists of exposing a 1:1 ratio by weight of material to deionized water. The mixture is briefly mixed then allowed to set for 30 minutes. The sample was then filtered ( 0.45 micron) and analyzed for metals.

Annualized loading was calculated using rainfall data (proportionally adjusted for site elevation between the Silverton and Red Mountain weather stations), exposed area of waste dump or tailings site and loading based on 1:1 water bath test results. For comparison to adit flow loadings projects, the annualized loading was converted to an average daily loading.

Based on these assumptions and procedures, SGC estimates that the average daily loading for this site have been as much as 8.0 pounds of dissolved zinc per day. SGC is under no obligation to defend these estimates and they should only be used as an estimate. SGC does not represent that its mitigation project at this site will remove any specific percentage of metals loading from this site: the loading estimate contained herein does not form the basis of an enforceable permit obligation.

### Description of Project

The initial reclamation plan for the waste dump was to regrade the dump, cover with soil and plant. Due to underlying tailings, SGC believes that it is best to remove the tailings to a more stable environment and therefore proposes to move the tailings and the waste dump material required to access the tailings to Tailings Pond #4 for consolidation. This has been the procedure to date; as of the end of 1995, a total of 90,200 cubic yards had been shipped. The material was pH adjusted to near neutral by lime addition at the pond. The material is similar in acid base potential and metal content with the tailings pond material.

All tailings encountered during excavation were removed, the waste dump remaining after tailings removal was feathered in to match the existing county road, the slopes were capped with a minimum of 16" of soil, the flat area was amended for direct revegetation, planted and mulched. Upland diversions will be improved to ensure that surface water flows are diverted away from the remaining material. Initial work on the waste dump removal project was started in 1994 as part of permitted work under SGC's MLR permit and SGC's stormwater permit. SGC considers the removal of tailings pile material to be authorized under the currently existing MLR permit.

Removal of the tailings pile portion of this project was scheduled for 1995. In 1995, 57,000 cubic yards were hauled, for a project total 90,200 cubic yards, to Tailings Pond #4 at the Mayflower Mill. The removal portion of this project is complete. The salvaged soils were spread over the hill side, limestone was added to neutralize the soil and the area was seeded and mulched according to SGC's MLR Permit reclamation plan.

Analysis

Removal of waste dump material and underlying historic tailings from potential contact with water and consolidation with tailings at the Mayflower Tailings Pond #4 is a Best Management Technique as is vegetating any material left onsite coupled with upland diversions. This project should continue to improve the South Fork of Cement Creek as did the 1991 removal of the historic tailings pond.

Monitoring

Ongoing monitoring of the South Fork of Cement Creek below the site at the American Tunnel, which is required by SGC's MLR Permit, will continue until released from MLR permit obligations.

Budget

SGC will fund this program.

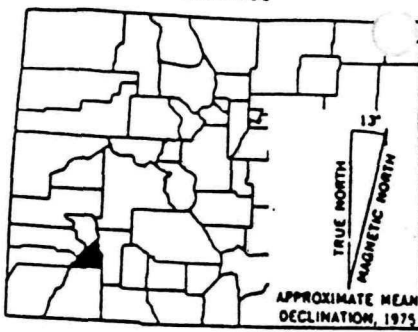
Description of Land Uses

This remediation work plan is intended to use Best Management Practices on the site to conform with surrounding land use policies for:

- 1) Land stabilization, limited rangeland and limited wildlife habitat to approximately resemble a mountain park ecosystem consistent with bordering undisturbed areas.
- 2) The conversion of facilities, usable for purposes other than mining, to alternate uses and preserve facilities of historic interest.

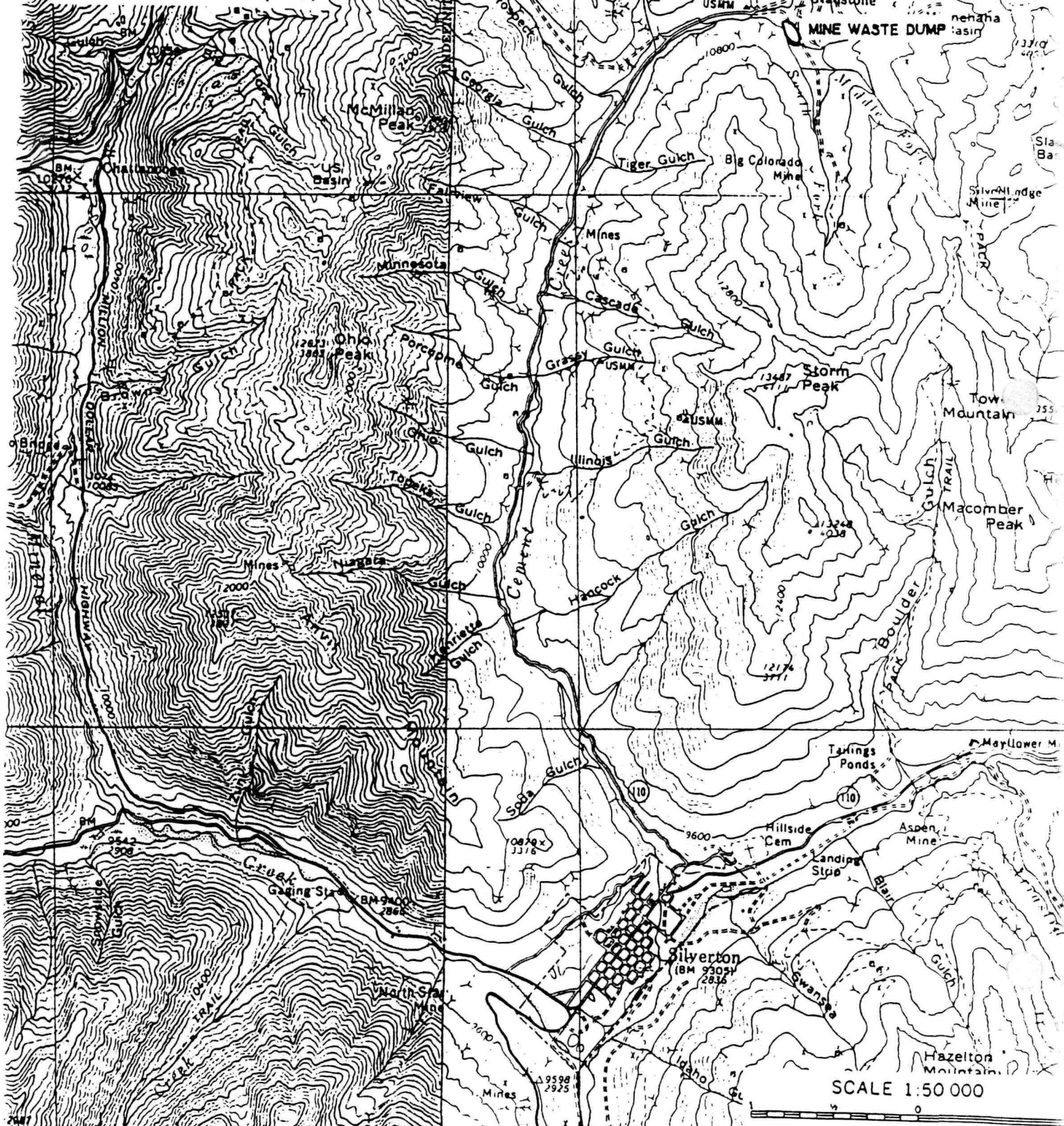
6. Consistency with Other Plans

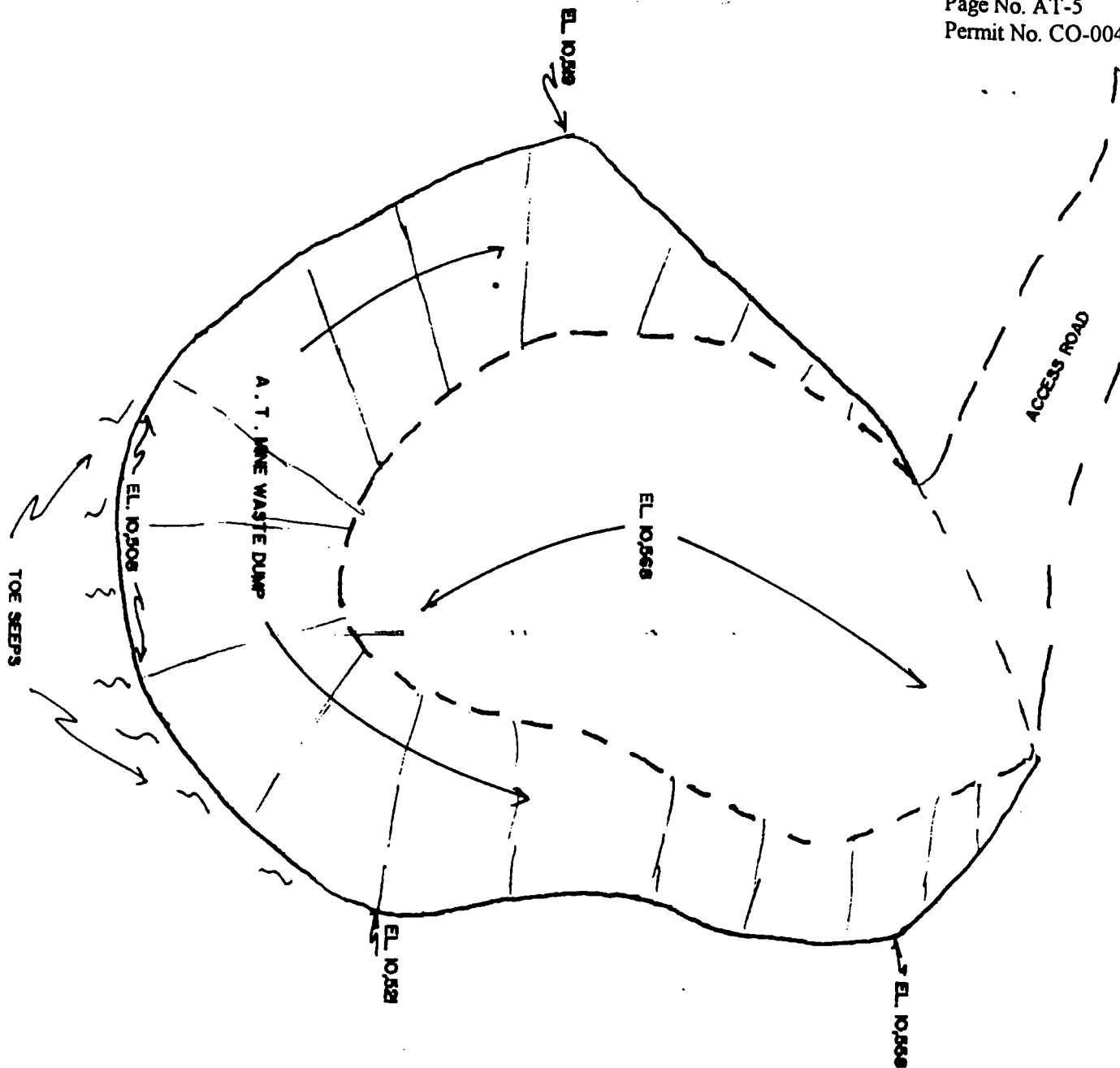
This mine remediation plan is consistent with Sunnyside's MLR permit # M-77-378.



**LOCATION DIAGRAM**

SUNNYSIDE GOLD CORP.  
SAN JUAN COUNTY, CO.





DATE	
TIME	
BY	
FOR	
REMARKS	

SUNNYSIDE GOLD  
 CORPORATION

AMERICAN TUNNEL  
 MINE WASTE DUMP

SCALE : 1 IN. = 50 FT.



# SITE CHARACTERIZATION DATA SUMMARY

SITE: AMERICAN TUNNEL WASTE DUMP

# SITE CHARACTERIZATION DATA SUMMARY

SITE: AMERICAN TUNNEL WASTE DUMP

MEDIA: SOILS

Analysis Method	Sample Description	Sample Date	DATA SOURCE	pH s.u.	Al ppm	Cd ppm	Cu ppm	Fe ppm	Mn ppm	Pb ppm	Zn ppm	COMMENTS
1:1 Water Bath	PbCO3		SGC		18.5	0.399	7.05	707	8.1	2.35	105	
Modified 1312 TCLP	PbCO3		SGC	<0.1		0.009	0.324	3.68	0.84	6.27	3.42	
Total Metal Conc.	PbCO3		SGC	2.6	810	43	1680	24700	120	3210	12300	
1:1 Water Bath	WASTE-SUB		SGC		751	0.228	0.997	1850	1012	1.19	334	
Modified 1312 TCLP	WASTE-SUB		SGC		104.5	0.019	0.137	187.4	81.5	<0.005	26	
Total Metal Conc.	WASTE-SUB		SGC	3.5	7050	0.4	25	17400	473	70.5	255	
1:1 Water Bath	SLUDGE		SGC		1.35	0.311	0.204	0.21	63	0.17	74	
Modified 1312 TCLP	SLUDGE		SGC		0.48	0.035	0.043	0.11	7.9	0.041	11.3	
Total Metal Conc.	SLUDGE		SGC	4.7	15500	125	368	39600	1800	2120	3820	
1:1 Water Bath	AT-LAKE SED-1		SGC		3.5	0.187	1.65	0.19	24	0.458	34	
Modified 1312 TCLP	AT-LAKE SED-1		SGC		0.51	0.015	0.144	<0.05	2.22	0.05	3.01	
Total Metal Conc.	AT-LAKE SED-1		SGC	3.8	14700.00	12	321	47500	1280	90	3590.00	
1:1 Water Bath	AT-LAKE SED-2		SGC		1.50	0.039	0.3	0.07	6.64	0.304	7.60	
Modified 1312 TCLP	AT-LAKE SED-2		SGC		<0.1	0.004	0.016	0.31	0.65	0.031	0.88	
Total Metal Conc.	AT-LAKE SED-2		SGC	3.8	14700.00	5	178	44500	1750	90	3590.00	
1:1 Water Bath	TOP BLK LAYER		SGC		29.60	8.21	11.7	11.3	191	3.6	610.00	
Modified 1312 TCLP	TOP BLK LAYER		SGC		3.20	0.529	1.3	1.24	15.6	4.2	46.50	
Total Metal Conc.	TOP BLK LAYER		SGC	2.9	1980.00	17.4	1620	9150	1140	44	2830.00	
1:1 Water Bath	BOG OLD LAYER		SGC		29.60	8.21	11.7	11.3	191	3.6	610.00	
Modified 1312 TCLP	BOG OLD LAYER		SGC		3.20	0.529	1.3	1.24	15.6	4.2	46.50	
Total Metal Conc.	BOG OLD LAYER		SGC	4.6	5120.00	2.2	23	21100	180	36	1060.00	
1:1 Water Bath	BOG SAND/CLAY		SGC		29.60	8.21	11.7	11.3	191	3.6	610.00	
Modified 1312 TCLP	BOG SAND/CLAY		SGC		3.20	0.529	1.3	1.24	15.6	4.2	46.50	
Total Metal Conc.	BOG SAND/CLAY		SGC	4.3	15500.00	0.5	74	19400	340	280	600.00	
1:1 Water Bath	AT WASTE DUMP		SGC		640.00	5	100	1070	480	0.29	1100.00	
Modified 1312 TCLP	AT WASTE DUMP		SGC		41	0.22	5.8	36	28	2	51	
Total Metal Conc.	AT WASTE DUMP		SGC	3.3	4100	20	3700	43800	900	4500	5600	

SITE CHARACTERIZATION DATA SUMMARY

SITE: AMERICAN TUNNEL WASTE DUMP

MEDIA: WATER

Sample	Filter/Unfilt.	Flow GPM	Sample Date	pH s.u.	Al mg/l	Cd mg/l	Cu mg/l	Fe mg/l	Mn mg/l	Pb mg/l	Zn mg/l	Comments
ATS-1	Filtered	0	28-Oct-88	ND	ND	ND	ND	ND	ND	ND	ND	
ATS-1	Filtered	0	11-May-89	4.76	5.9	0.341	1.07	0.09	85.7	0.69	51.2	
ATS-1	Filtered	5	05-Oct-89	5.2	1.8	0.034	0.11	0.12	4.44	0.066	4.81	
ATS-1	Filtered	2.08	13-Jun-90	4.73	0.9	0.002	0.03	0.32	1.24	0.031	1.81	
ATS-1	Filtered	0.07	10-Jul-90	5.05	1.4	0.013	0.06	0.75	9.95	0.014	4.98	
ATS-1	Filtered	0	07-Aug-90	ND	ND	ND	ND	ND	ND	ND	ND	
ATS-1	Filtered	0	11-Sep-90	ND	ND	ND	ND	ND	ND	ND	ND	
ATS-1	Filtered	0	23-Oct-90	ND	ND	ND	ND	ND	ND	ND	ND	
ATS-1	NO FLOW		14-May-91	ND	ND	ND	ND	ND	ND	ND	ND	
ATS-1	Filtered	20	31-May-91	4.73	0.8	0.003	0.01	0.11	0.48	ND	1.1	
ATS-1	Filtered	10	13-Jun-91	4.67	0.8	0.0025	ND	0.27	0.49	0.007	1.18	
ATS-1	STANDING		24-Sep-91	4.25	1.1	0.002	0.03	1.38	1.78	ND	1.83	
ATS-1	Filtered	0.72	09-Jun-92	4.53	38.4	0.314	2.19	74.9	107	1.19	81.3	
ATS-1	Filtered	3.71	06-Jun-93	5	1	<0.002	0.03	0.05	0.74	<0.005	0.93	
ATS-1	Filtered	1.2	03-Jun-94	5.3	0.6	<0.002	0.01	<0.05	0.8	<0.005	0.62	
ATS-1	NO FLOW		26-Oct-94	ND	ND	ND	ND	ND	ND	ND	ND	
ATS-1	NO FLOW		11-Jul-95	ND	ND	ND	ND	ND	ND	ND	ND	
ATS-2	Filtered	0	28-Oct-88	ND	ND	ND	ND	ND	ND	ND	ND	
ATS-2	Filtered	15	11-May-89	4.13	18.7	ND	0.98	4.08	212	1.25	104	
ATS-2	Filtered	1	22-Jun-89	3.8	17.1	0.0	0.7	6.28	224	0.13	97.68	
ATS-2	Filtered	2	*10/5/89	3.4	25.2	2.1	1.4	26.95	467.9	0.7	102.64	
ATS-2	Filtered	9.72	13-Jun-90	4.2	18.1	0.1	0.9	3.58	192	1.844	93.1	
ATS-2	Filtered	5	10-Jul-90	3.8	14.0	0.5	0.9	2.34	225	2.331	93.8	
ATS-2S	Filtered	0.5	07-Aug-90	3.25	8.6	0.045	0.44	7.02	162	1.18	45.4	
ATS-2C	Filtered	0.5	07-Aug-90	3.5	17.5	0.125	0.72	1.58	241	1.85	94.2	
ATS-2	Filtered	0.75	11-Sep-90	3.68	18.4	0.268	0.02	4.72	263	<0.005	104	
ATS-2S	Filtered	3	23-Oct-90	3.08	10.7	0.16	0.95	20.4	124	0.91	55.6	
ATS-2C	Filtered	4	23-Oct-90	3.02	48.7	0.58	1.81	15.3	332	1.28	149	
ATS-2	NO FLOW		14-May-91	ND	ND	ND	ND	ND	ND	ND	ND	
ATS-2	Filtered	20	31-May-91	2.97	42.8	0.497	2.55	39.21	266.3	0.92	155.5	
ATS-2	Filtered	25	13-Jun-91	2.79	42.3	0.0058	2.15	44.02	304.6	0.135	787.1	
ATS-2	Filtered	10	24-Sep-91	2.77	73	0.815	4.25	62.25	386.5	0.78	228.1	
ATS-2	Filtered	3.57	09-Jun-92	2.41	143	1.41	9.41	418	488	0.48	857	
ATS-2	Filtered	2.93	06-Jun-93	2.8	177	1.48	14.1	448	482	0.51	509	
ATS-2	Filtered	2.083	09-Sep-93	2.8	341	3.3	3.2	784	672	0.26	840	
ATS-2	Filtered	0.7	03-Jun-94	2.5	1160	2.02	0.8	3040	1430	0.35	1930	
ATS-2	NO FLOW		26-Oct-94	ND	ND	ND	ND	ND	ND	ND	ND	
ATS-2	Filtered	1.3889	11-Jul-95	2.9	878	7.48	89.2	2390	1630	0.17	1906	
ATS-COMP Filtered		31	08-Jun-93		45.7	0.31	3.19	80.1	132	1.03	108	
ATS-COMP Filtered		0.57	09-Sep-93	2.6	159	1.67	1.94	344	336	0.8	456	

# **SITE CHARACTERIZATION DATA SUMMARY**

**SITE: AMERICAN TUNNEL WASTE DUMP**

**RAINFALL DATA:** Source: Silverton Weather Station

YEAR	Rainfall Inch		Snow Inch	Moisture as Snow Inch	Total Moisture Inch
June '91-May '92	9		134.75	11.58	21.1
June '92-May '93	9.82		280.5	12.89	22.71
June '93-May '94	7		130.5	10.03	17.45

**RAINFALL DATA:** Source: Iderado Mining Company--Red Mountain Weather Station

YEAR	Rainfall Inch		Snow Inch	Moisture as Snow Inch	Total Moisture Inch
June '91-May '92	8		444.5	35.8	43.6
June '92-May '93	8.8		545.5	49.9	58.7
June '93-May '94	7.1		330.5	28.1	33.2

Mine Remediation Plan: Boulder Creek Tailings Project

Remediating Party: Sunnyside Gold Corporation  
P.O. Box 177  
Silverton, CO 81433

contact William B. Goodhard  
Resident Manager

1. Description of Mining Activities

Physical Description of Conditions

An old retention pond exists along the west bank of the Animas River. The pond is dry and consists of tailings. There is minimal vegetation on the pond and it is exposed to rainfall and snowmelt. There is an estimated measured total of 1300 cubic yards of tailings. The pond was used by previous owners of the Mayflower Mill during startup and shutdown of the mill as a tailings system catchment. This system was used in the mid to late 1970's.

General Description of the Mining Site

The Boulder Creek Tailings Project is located 1.7 miles north of Silverton along Colorado State Highway 110. The site is east of the Highway and just north of the confluence of Boulder Creek and the Animas River. See the attached location map. The total disturbed land is approximately 0.5 acres.

Identification of Lands

Lands lie between Colorado 110E and the Animas River to the north of Boulder Creek, San Juan County, Colorado. See attached location map and site map.

Latitude 37 degrees 50 minutes

Longitude 107 degrees 38 minutes

Identification of the Waters of the United States Potentially Affected

Boulder Creek and the Animas River at the confluence of Boulder Creek. See attached map.

2. Site Map

Attached

3. Stormwater Management Controls

Since the tailings are dry and have no water other than from storm events, removal can be scheduled such that existing berm will serve for sediment catchment during removal. Should other temporary stormwater control measures be needed as removal takes place, they will be installed.

4. Inspection and record keeping Procedures

The Manager or a member of the Technical Service Department will inspect this project prior to and during remediation efforts on a regular basis. Quarterly reports and photographs will be sent to both the Colorado Water Quality Control Division and the Colorado Division of Minerals and Geology. Prior to remediation efforts the area will be Photographed and the Photographs will be submitted with the first quarterly report.

## 5. Mine Remediation Plan

### Legal Right to Enter and Conduct Activities

SGC has contacted the property owner concerning this project. Permission will be sought when terms of the remedial projects are substantially agreed upon. No work will commence until proper permission is granted.

### Remedial Goals and Objectives

Cleanup of historic tailings and removal from contact with rainwater and snowmelt in order to reduce potential impacts to the Animas River from dissolved metals and mineralized sediment.

### Site Loading Estimate

For all of the remediation projects, and based on limited information, the site loading estimate for each project site was based on the following methodology:

#### Adits-

Using available data, zinc loading was calculated based on the average flow and average zinc values.

#### Mine Waste Dumps and Tailings Piles-

Site composite soil samples were tested using a water bath extraction. This test consists of exposing a 1:1 ratio by weight of material to deionized water. The mixture is briefly mixed then allowed to set for 30 minutes. The sample was then filtered ( 0.45 micron) and analyzed for metals.

Annualized loading was calculated using rainfall data (proportionally adjusted for site elevation between the Silverton and Red Mountain weather stations), exposed area of waste dump or tailings site and loading based on 1:1 water bath test results. For comparison to adit flow loadings projects, the annualized loading was converted to an average daily loading.

Based on these assumptions and procedures, SGC estimates that the average daily loading for this site may be as much as 7.5 pounds of dissolved zinc per day. SGC is under no obligation to defend these estimates and they should only be used as an estimate. SGC does not represent that its mitigation project at this site will remove any specific percentage of metals loading from this site: the loading estimate contained herein does not form the basis of an enforceable permit obligation.

### Description of Project

The tailings are dry through most of the year except during high rain events and snowmelt. The pond will be removed and hauled to SGC's Mayflower Tailings Pond #4. Under Sunnyside Gold's MLR Permit (M-77-378) this material can be consolidated into Tailings Pond # 4. The pH of the tailings will be adjusted by mixing with high pH material during consolidation. The tailings will be capped and planted as part of SGC's approved reclamation plan for Tailings Pond #4. The soil at the project site will be tested for necessary amendments, then seeded and mulched. This plan is subject to notification requirements for disturbance of Historical Mining Sites to the board of the San Juan County Commissioners.

### Work Plan

- 1) Remove old tailings utilizing the existing berm for sediment catchment.
- 2) Relocate the tailings to Tailings Pond #4 at the Mayflower Mill and mix with pH neutralizing material.
- 3) Regrade area to blend in with surrounding topography.
- 4) Add soil amendments as necessary, seed and mulch.

### Analysis

Removal and consolidation from rain and snow melt is a Best Management Practice. This will isolate the material from direct contact with stormwater events and reduces the risk for potential impact to the Animas River and Boulder Creek.

**Attachment BC**  
**Page BC-3**  
**Permit No. CO-0044768**

**Monitoring**

Due to the close proximity and the high flow which occurs in the Animas River no monitoring is contemplated for this project. In lieu of monitoring at this location the tributary mouth will be sampled on a rotating basis with the U. S. Bureau of Reclamation. Monitoring reports will be submitted the month after the information is available as well as with the quarterly reports and sent to both the Water Quality Control Division and the Division of Minerals and Geology.

**Budget**

SGC will fund this project unless the property owner chooses to contribute.

**Description of Land Use**

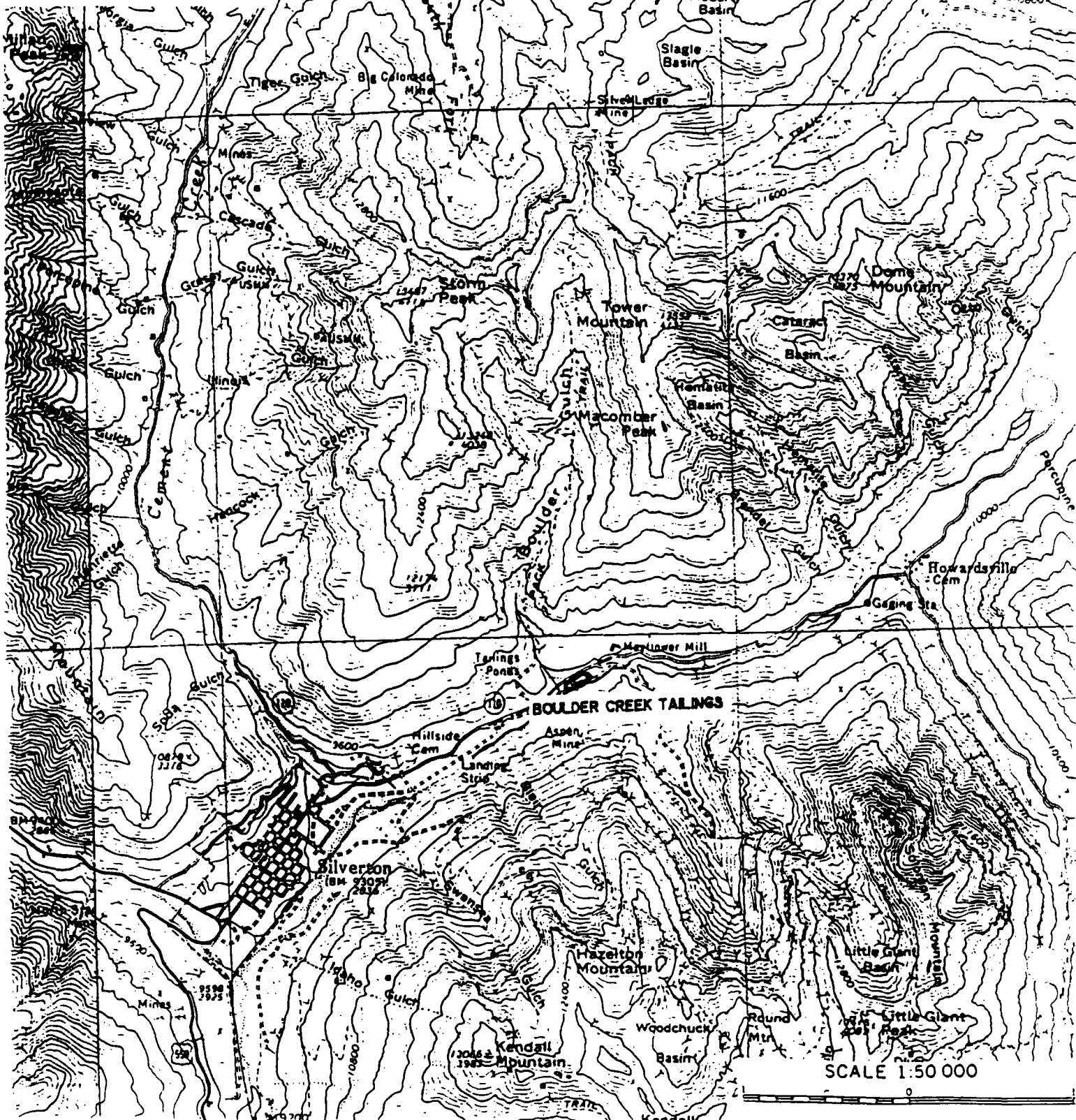
This remediation work plan is intended to use Best Management Practices on the site to conform with surrounding land use policies for:

- 1) Land stabilization, limited rangeland and limited wildlife habitat to approximately resemble a mountain park ecosystem consistent with bordering undisturbed areas.
- 2) The conversion of facilities, usable for purposes other than for mining, to alternate uses and preserve facilities of historic interest.

**6. Consistency with Other Plans**

This mine remediation plan is the only cleanup plan for this site. Consolidation of the tailings material at Tailings Pond #4 is consistent with Sunnyside Gold Corporation's Colorado MLR Permit M-77-378.

SUNNYSIDE GOLD CORP.  
SAN JUAN COUNTY, CO.







**SITE CHARACTERIZATION DATA SUMMARY**

**SITE: BOULDER CREEK TAILINGS**

**SITE CHARACTERIZATION DATA SUMMARY**

**SITE: BOULDER CREEK TAILINGS**

**MEDIA: SOILS**

Analysis Method	Sample Description	Sample Date	DATA SOURCE	pH	Al	Cd	Cu	Fe	Mn	Pb	Zn	COMMENTS
				s.u.	ppm	ppm	ppm	ppm	ppm	ppm	ppm	
1:1 Water Bath	Tailings-Old Pond		SGC		158	5.18	67.2	220	249	2.42	1125	
Modified 1312 TCLP	Tailings-Old Pond		SGC		14.8	0.334	4.49	8.7	11.7	3.55	80.5	
Total Metal Conc.	Tailings-Old Pond		SGC	2	4450	115	3310	52000	1130	26200	36500	

**SITE CHARACTERIZATION DATA SUMMARY**

**SITE: BOULDER CREEK TAILINGS**

**RAINFALL DATA:** Source Silverton Weather Station

YEAR	Rainfall		Snow Inch	Moisture as Snow Inch	Total Moisture Inch
	Inch				
June '91-May '92	9.55		134.75	11.58	21.1
June '92-May '93	9.82		260.5	12.89	22.71
June '93-May '94	7.42		130.5	10.03	17.45

Mine Remediation Plan: Columbus Mine Portals

Remediating Party: Sunnyside Gold Corporation  
P.O. Box 177  
Silverton, CO 81433

contact William B. Goodhard  
Resident Manager

### 1. Description of Mining Activities

#### Physical Description of Conditions

The project area includes two mine portals and two waste dumps. The lower portal discharges onto the mine dump and percolates through it. The dumps are exposed to rainwater and snowmelt as well. The regional geology is volcanic rocks with narrow veins containing base metals; Fe, Pb, Cu and Zn. Sampling of the waters in this area indicates that even though the portal discharge is small, there is a substantial increase in dissolved metal loading to the Animas River.

#### General Description of the Mining Site

The history, including dates of operation, of this property is not known by Sunnyside Gold Corporation. However it is easy to see that this property is very old as evidenced by the historical structures. This surface disturbance is approximately 2.0 acres.

#### Identification of Lands

The Columbus mine portals and waste dumps lie immediately north of Animas Forks, San Juan County, Colorado. See attached location and site map.

#### Identification of the Waters of the United States Potentially Affected

This property sits directly above the confluence of the Animas River and the West Fork of the Animas River. See attached location map.

### 2. Site Map

Attached

### 3. Stormwater Management Controls

Prior to any work taking place on the property, Sunnyside will install sediment catchment traps to minimize impacts from sediments entering the waters of the State.

### 4. Inspection and Record Keeping

The Manager or a member of the Technical Services Department will inspect this property on a regular basis while the work is being done and periodically until the permit is released. Quarterly reports with photographs will be submitted to both the Water Quality Control Division and The Colorado Division of Minerals and Geology. Photographs of the property prior to remediation will be submitted with the first quarterly report.

### Monitoring

Monitoring points will be upstream and downstream at this project site as well as flows from the adits and dumps. Stream sampling for this project will occur in the North Fork and the West Fork of the Animas River. Monitoring will start prior to remediation work and continue until two years after the project is completed. Monitoring will occur four times

yearly with one at high flow and two at low flow and will be submitted by the 28th day of the month following receipt of analysis as well as with the quarterly reports. All samples taken will be analyzed for dissolved metals Zn, Fe, Al, Mn, Cd, and Cu, total sulfate, hardness, a field pH as well as flow measurements.

#### Reporting

Should this project become necessary to maintain water quality in the Upper Animas, SGC will notify WQCD prior to work starting. Prior to installation of hydraulic seals in the adits, SGC will submit seal designs to WQCD. SGC will submit quarterly reports for this project. Once all reclamation activities are complete, a final report will be submitted. Reports will be sent to the Division of Minerals and Geology as well as the Water Quality Control Division. The report will include activities to date as well as planned activities for future work.

#### 5. Mine Remediation Plan

##### Legal Right to Enter and Conduct Activities

SGC has not contacted the property owner. No contact will be initiated until substantial agreement is reached with WQCD concerning remediation projects. No work will commence until proper permission is granted.

##### Remedial Goals and Objectives

Reduction of low pH, metal laden waters flowing into the West Fork of the Animas River at Animas Forks by:

- 1) reduction of acidity in the headwaters through limiting the quantity of waters reacting with pyrite and other sulfide minerals.
- 2) reduction of exposure to waste material by snowmelt and rainwater.
- 3) visually reclaim area while preserving historic aspects.

##### Site Loading Estimate

For all of the remediation projects, and based on limited information, the site loading estimate for each project site was based on the following methodology:

###### Adits-

Using available data, zinc loading was calculated based on the average flow and average zinc values.

###### Mine Waste Dumps and Tailings Piles-

Site composite soil samples were tested using a water bath extraction. This test consists of exposing a 1:1 ratio by weight of material to deionized water. The mixture is briefly mixed then allowed to set for 30 minutes. The sample was then filtered (0.45 micron) and analyzed for metals.

Annualized loading was calculated using rainfall data (proportionally adjusted for site elevation between the Silverton and Red Mountain weather stations), exposed area of waste dump or tailings site and loading based on 1:1 water bath test results. For comparison to adit flow loadings projects, the annualized loading was converted to an average daily loading.

Based on these assumptions and procedures, SGC estimates that the average daily loading for this site may be as much as 22.6 pounds of dissolved zinc per day. SGC is under no obligation to defend these estimates and they should only be used as an estimate. SGC does not represent that its mitigation project at this site will remove any specific percentage of metals loading from this site: the loading estimate contained herein does not form the basis of an enforceable permit obligation.

##### Description of Project

The waste dumps will be isolated from portal flows as well as stormwater events. The dumps will be regraded and hydrologic diversions installed to prevent run on conditions. The dumps would then be stabilized with basic pH material and revegetated to minimize percolation from stormwater events.

The two portals will be opened and studied for the placement of hydraulic seals. In order for hydraulic seals to be placed, SGC feels that sites meeting the following conditions need to be found.

- 1) Location far enough underground to avoid the near surface fractures and joints caused by weathering.

- 2) Adequate rock compressive strength for structural stability.
- 3) A length of the tunnel with minimal faulting or other geologic features that may serve as a leakage pathway.
- 4) Adequate ground cover over the potential site to resist the hydrostatic forces from the potential maximum head.

If an acceptable location can be found, SGC will design and install two hydraulic seals. After sealing is complete, the seal will be contact grouted and the diversion pipes, if necessary for construction, grouted. The near surface fracture flows typically found will be diverted to avoid contact with waste material and the portal closed. Design of hydraulic seals will be according to current engineering practices. The design approach will be similar to the attached paper on Tunnel Bulkheads.

This plan is also subject to notification requirements for disturbance of Historical Mining Sites to the board of the San Juan County Commissioners.

#### Work Plan

- 1) Build catchments for potential adit releases.
- 2) Open and evaluate adits for hydraulic seals.
- 3) Design and install hydraulic seals.
- 4) Grout seals and bypass pipes.
- 5) Portal closure.
- 6) Surface diversions and dump regrading.
- 7) Addition of pH neutralizing material, seeding and mulching.

#### Analysis

Diversion and isolation of the mine dumps (including pH stabilization) will isolate this material from direct contact with run on and intermittent flows and minimize infiltration from stormwater events. This will improve water quality of the Animas River at Animas Forks.

The hydraulic seals proposed for the Columbus Adits will reduce the unsaturated zone by removing the drain. This will result in minimizing the oxygen available for reaction with the sulfide materials in the area. The hydrological conditions will be restored to an approximation of pre mining conditions.

#### Contingency Plans

Should the concept of hydraulic seals not be practical after engineering studies, SGC will consult with the Division of Minerals and Geology and WQCD for other mine drainage mitigation alternatives. If an acceptable system can be arrived at, SGC will install such a system.

Catchments will be provided in order to prevent impact to the Animas River during excavation prior to opening portals.

#### Monitoring

Monitoring points will be upstream and downstream at this project site as well as flows from the adits and dumps. Stream sampling for this project will occur in the North Fork and the West Fork of the Animas River. Monitoring will start prior to remediation work and continue until two years after the project is completed. Monitoring will occur four times

yearly with one at high flow and two at low flow and will be submitted by the 28th day of the month following receipt of analysis as well as with the quarterly reports. All samples taken will be analyzed for dissolved metals; Zn, Fe, Al, Mn, Cd, and Cu, total sulfate, hardness, a field pH as well as flow measurements.

#### Budget

SGC will fund this project.

Description of Land Use

This remediation work plan is intended to use Best Management Practices on the site to conform with surrounding land use policies for:

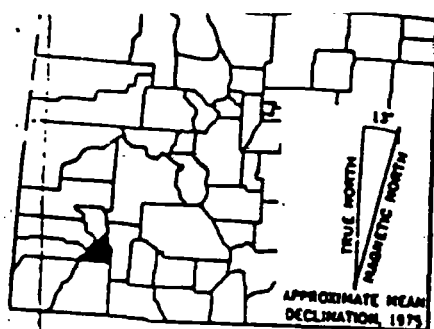
- 1) Land stabilization, limited rangeland and wildlife habitat to approximately resemble a mountain park ecosystem consistent with bordering undisturbed areas.
- 2) The conversion of facilities, usable for purposes other than for mining, to alternate uses and preserve facilities of historic interest.

Attachment Available From WOOD Upon Request

"Tunnel Bulkheads for Acid Mine Drainage", Einarson and Abel, Proc Int'l Symp on Unique Underground Structures, 1990

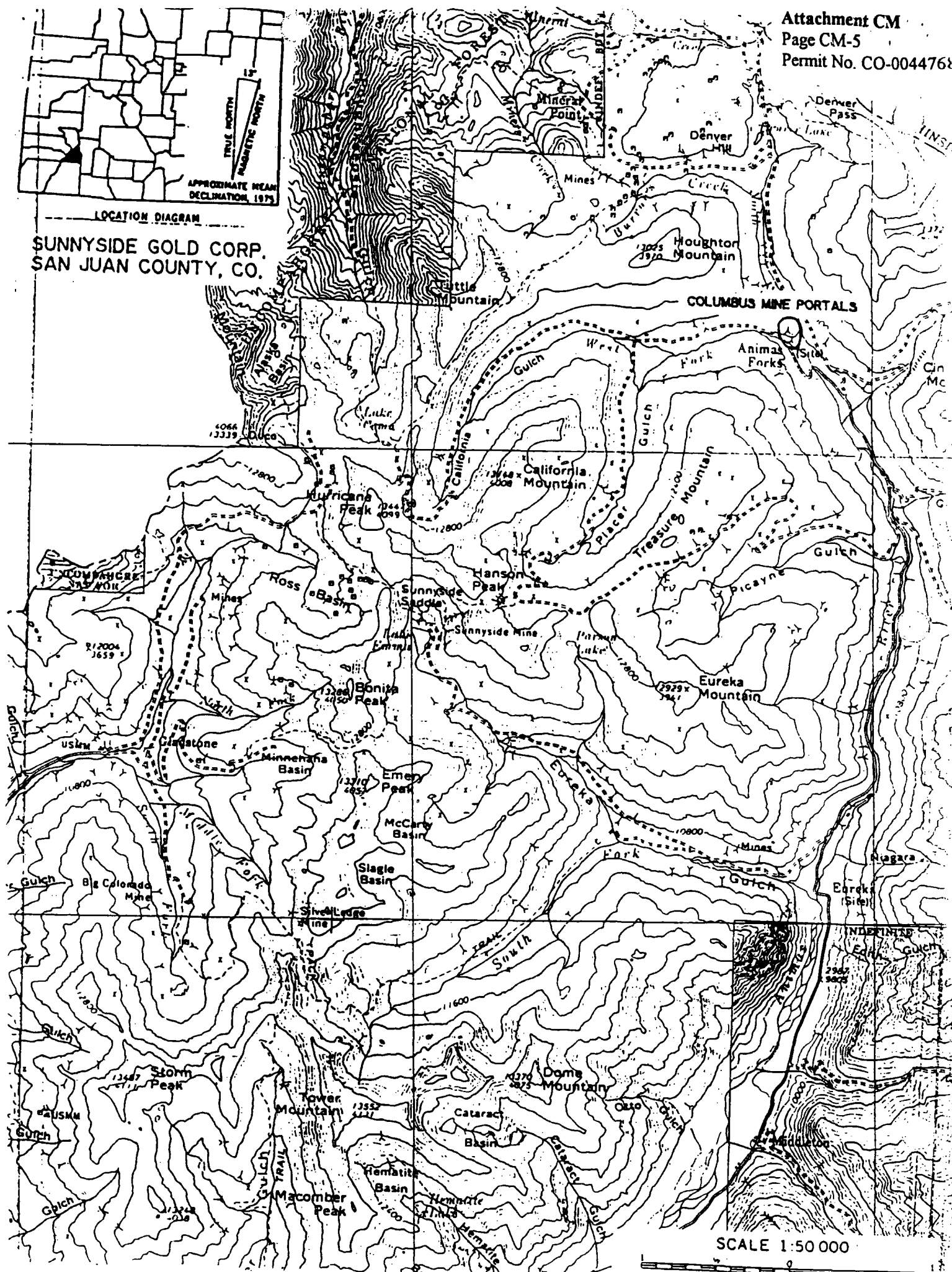
6. Consistency with Other Plans

There are no other remediation plans for this property.

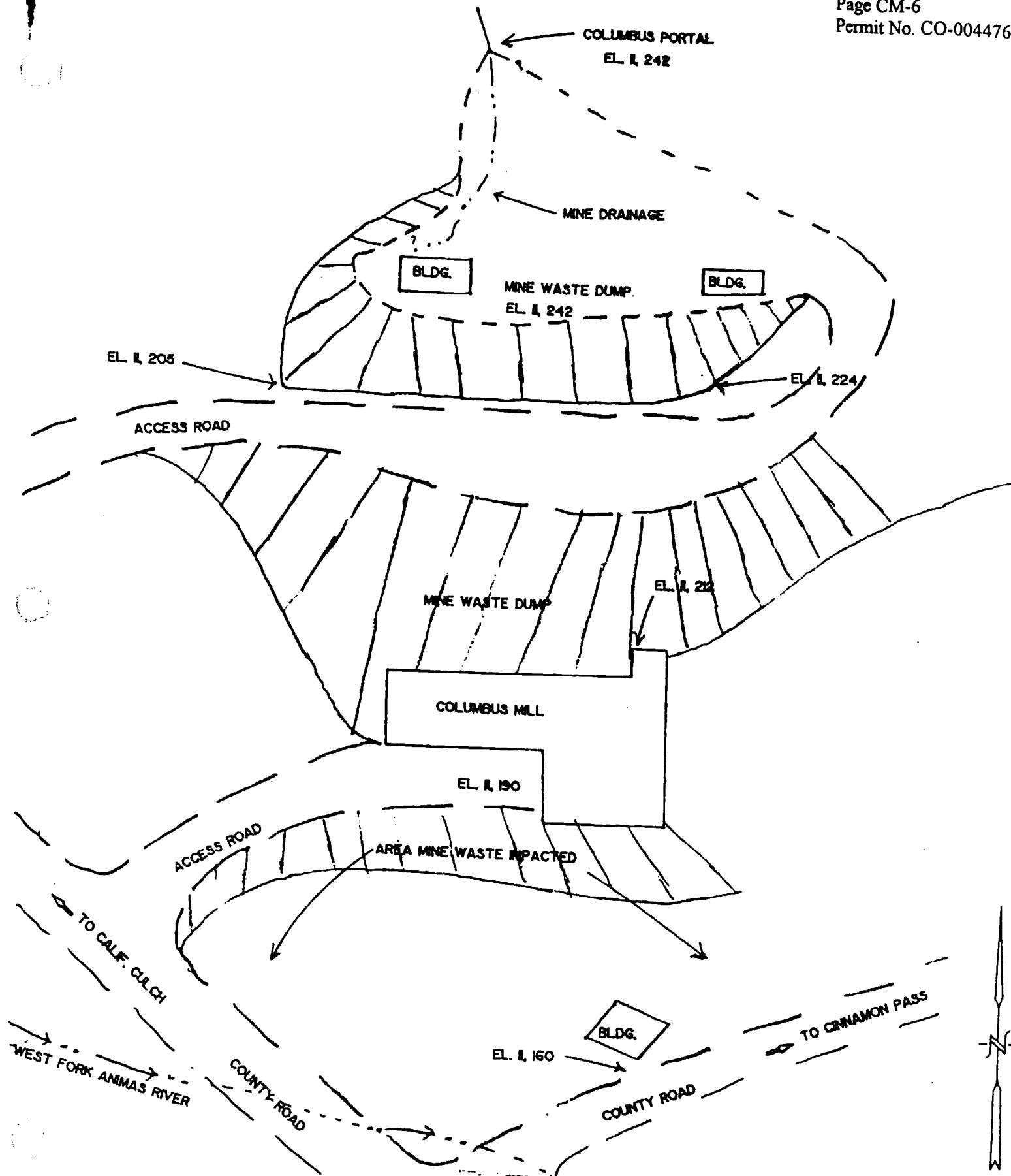


LOCATION DIAGRAM

SUNNYSIDE GOLD CORP.  
SAN JUAN COUNTY, CO.



SCALE 1:50,000



DESIGNED BY	
DRAWN BY	
CHECKED BY	
DATE	
PROJECT NO.	
LOCATION	

**SUNNYSIDE GOLD CORPORATION**

COLUMBUS MINE SITE

SCALE : 1 IN. = 50 FT.



# SITE CHARACTERIZATION DATA SUMMARY

SITE: COLUMBUS MINE

# SITE CHARACTERIZATION DATA SUMMARY

SITE: COLUMBUS MINE

MEDIA: WATER

Sample	Filt./Unfilt.	Flow GPM	Sample Date	DATA SOURCE	pH s.u.	Al mg/l	Cd mg/l	Cu mg/l	Fe mg/l	Mn mg/l	Pb mg/l	Zn mg/l	Comments
A11a	Filt	9	20-Jul-93	CDPHE	8.35	13.00	0.9	8.2	63		0.31	210.00	Columbus adit
A11	Unfilt	2585	10-Sep-91	CDPHE	6.05	2.00	0.0037	0.018	0.18	4.1	0.012	1.20	W Fork Animas above Columbus
	Filt		10-Sep-91	CDPHE		1.20	0.0033	0.014	0.053	4.1	<	1.20	
	Unfilt	14945	25-Jun-92	CDPHE	5.88								
	Filt		25-Jun-92	CDPHE		0.73	0.0042	0.02			<	0.96	
	Unfilt	434	15-Oct-92	CDPHE	6.77		0.008	0.018	0.1		<	1.60	
	Filt		15-Oct-92	CDPHE		0.16	0.005	0.008			<	1.50	
	Unfilt	5749	20-Jul-93	CDPHE	5.99								
	Filt		20-Jul-93	CDPHE		0.27	0.00293	0.016	0.02		<	0.84	
A10	Unfilt	2105	10-Sep-91	CDPHE	6.03	2.10	0.005	0.033	0.22	3.7	0.012	1.40	W Fork Animas below Columbus
	Filt		10-Sep-91	CDPHE		1.00	0.005	0.028	0.046	3.7	<	1.40	
	Unfilt	14990	25-Jun-92	CDPHE	6.02		0.0048	0.027	0.078		0.007	1.00	
	Filt		25-Jun-92	CDPHE		0.64	0.004	0.023		2.9	<	1.00	
	Unfilt	776	15-Oct-92	CDPHE	7.25		0.007	0.044	0.12		<	2.10	
	Filt		15-Oct-92	CDPHE		0.18	0.007	0.029		3.6	<	2.00	
	Unfilt	5623	20-Jul-93	CDPHE	6.52								
	Filt		20-Jul-93	CDPHE		0.90	0.00297	0.02	0.066		<	0.85	

# **SITE CHARACTERIZATION DATA SUMMARY**

**SITE: COLUMBUS MINE**

**RAINFALL DATA:** Source Silverton Weather Station

YEAR	Rainfall Inch		Snow Inch	Moisture as Snow Inch	Total Moisture Inch
June '91-May '92	9.55		134.75	11.58	21.1
June '92-May '93	9.82		280.5	12.89	22.71
June '93-May '94	7.42		130.5	10.03	17.45

**RAINFALL DATA:** Source Idarado Mining Company--Red Mountain Weather Station

YEAR	Rainfall Inch		Snow Inch	Moisture as Snow Inch	Total Moisture Inch
June '91-May '92	8.0		444.5	35.8	43.6
June '92-May '93	8.8		545.5	49.9	58.7
June '93-May '94	7.1		330.5	28.1	33.2

Mine Remediation Plan: Surface Mill Tailings at Eureka

Remediating Party: Sunnyside Gold Corporation  
P.O. Box 177  
Silverton, CO 81433

contact William B. Goodhard  
Resident Manager

**1. Description of Mining Activities**

**Physical Description of Conditions**

The southern half of the old townsite of Eureka may have been impacted by milling operations in the early part of the century. The historic tailings are in two large ponds as well as smaller scattered locations throughout the southern half of the townsite. The total measured estimated volume is 65,500 cubic yards. These tailings are exposed to rain waters, snow melt, high flow in the Animas River and high flow in the South Fork of the Animas River and are subject to erosion from periodic changes in the river channel. As a result, there may be an impact on the Animas River. The area is visually impaired due to historic mining debris.

**General Description of the Mining Site**

The historic tailings were deposited in the late 1920's and early 1930's when early attempts were made to keep the tailings from the historic mill out of the Animas River. The total disturbed area is approximately 9.1 acres.

**Identification of Lands**

Historic surface tailings disturbance located at the abandoned townsite of Eureka, in San Juan County Colorado. See attached general location map and site map.

Latitude 37 degrees 53 minutes Longitude 107 degrees 34 minutes

**Identification of the Waters of the United States Potentially Affected**

Animas River below the confluence with Eureka Creek and the confluence of Minnie Gulch. See attached map.

**2. Site Map**

Attached

**3. Stormwater Management Controls**

Sediment traps will be created as needed below the project to prevent tailings from being washed into the Animas River. The traps will be cleaned and removed when no longer necessary for the project.

**4. Inspection and Record keeping**

The Manager or a member of the Technical Service Department will inspect this property on a regular basis while the work is being done and periodically until the permit is released. Quarterly reports with photographs will be submitted to both the Water Quality Division and the Colorado Division of Minerals and Geology. Photographs of the property prior to remediation will be submitted with the first quarterly report.

## 5. Mine Remediation Plan

### Legal Right to Enter and Conduct Activities

Besides SGC, there are two other owners who will be contacted for permission to enter and conduct activities on their property. SGC will contact property owners after substantial agreement on remedial projects is reached. No work will commence until property owners' permission is obtained. SGC has not contacted these property owners concerning this project at this time.

Property ownership is as follows:

Sunnyside Gold Corporation 54%  
United States Bureau of Land Management 22%  
San Juan County 24%

### Remedial Goals and Objectives

Cleanup of historic tailings and removal from contact with rainwater, snowmelt and stream flows in order to reduce the potential impact to the Animas River from heavy metals.

### Site Loading Estimate

For all of the remediation projects, and based on limited information, the site loading estimate for each project site was based on the following methodology:

#### Adits-

Using available data, zinc loading was calculated based on the average flow and average zinc values.

#### Mine Waste Dumps and Tailings Piles-

Site composite soil samples were tested using a water bath extraction. This test consists of exposing a 1:1 ratio by weight of material to deionized water. The mixture is briefly mixed then allowed to set for 30 minutes. The sample was then filtered ( 0.45 micron) and analyzed for metals.

Annualized loading was calculated using rainfall data (proportionally adjusted for site elevation between the Silverton and Red Mountain weather stations), exposed area of waste dump or tailings site and loading based on 1:1 water bath test results. For comparison to adit flow loadings projects, the annualized loading was converted to an average daily loading.

Based on these assumptions and procedures SGC, estimates that the average daily loading for this site may be as much as 3.6 pounds of dissolved zinc per day. SGC is under no obligation to defend these estimates and they should only be used as an estimate. SGC does not represent that its mitigation project at this site will remove any specific percentage of metals loading from this site: the loading estimate contained herein does not form the basis of an enforceable permit obligation.

### Description of Project

Sunnyside Gold Corporation (SGC) will provide sediment catchment traps below the tailings, then remove tailings, add high pH material to stabilize pH near neutral and redeposit tailings at the Mayflower Tailings Pond #4. Under Sunnyside Gold Corporation's MLR Permit M-77-378 this material can be consolidated into Tailings Pond #4. The tailings would then be capped with growth media and planted as part of the approved reclamation plan at Tailings Pond #4. Any material caught in the catchment traps will also be removed. This project may require a 404 permit from the Army Corps of Engineers due to work occurring in a flood plain. This plan is also subject to notification requirements for disturbance of Historical Mining Sites to the board of the San Juan County Commissioners.

The area is an active alluvial fan with little or no topsoil or vegetation. Therefore, seeding is not planned. This work is planned to take place in 1996 during late summer and early fall at low flow conditions. It is envisioned that notification prior to starting will be given and a final report on total yards moved and amount of alkaline material used will be submitted after construction is completed.

Work Plan

- 1) Build sediment catchment traps as needed to contain material during excavation.
- 2) Load and haul tailings material to Tailings Pond #4 at the Mayflower Mill.
- 3) Add pH neutralizing material to tailings.
- 4) Regrade alluvial fan to blend in with surrounding topography.

Analysis

Removal of the tailings from rain, snow melt and streamflow with capping at Tailings Pond #4 with pH adjustment is a Best Management Practice which will be used to minimize impacts to waters of the State.

Monitoring

Due to the close proximity and the high flow which occurs in the Animas River, no monitoring is contemplated for this project. In lieu of monitoring at this location, the tributary mouth will be sampled on a rotating basis with the U. S. Bureau of Reclamation. Monitoring reports will be submitted by the 28th of the month after the analysis is received as well as with the quarterly reports and sent to both the Water Quality Control Division and the Division of Minerals and Geology.

Budget

SGC will fund this program unless other property owners choose to commit funding to this project.

Description of Land Use

This remediation work plan is intended to use Best Management Practices on the site to conform with surrounding land use policies for:

- 1) Land stabilization, limited rangeland and limited wildlife habitat to approximately resemble a mountain park ecosystem consistent with bordering undisturbed areas.
- 2) The conversion of facilities, usable for purposes other than for mining, to alternate uses and preserve facilities of historic interest.

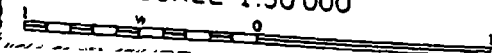
6. Consistency with Other Plans

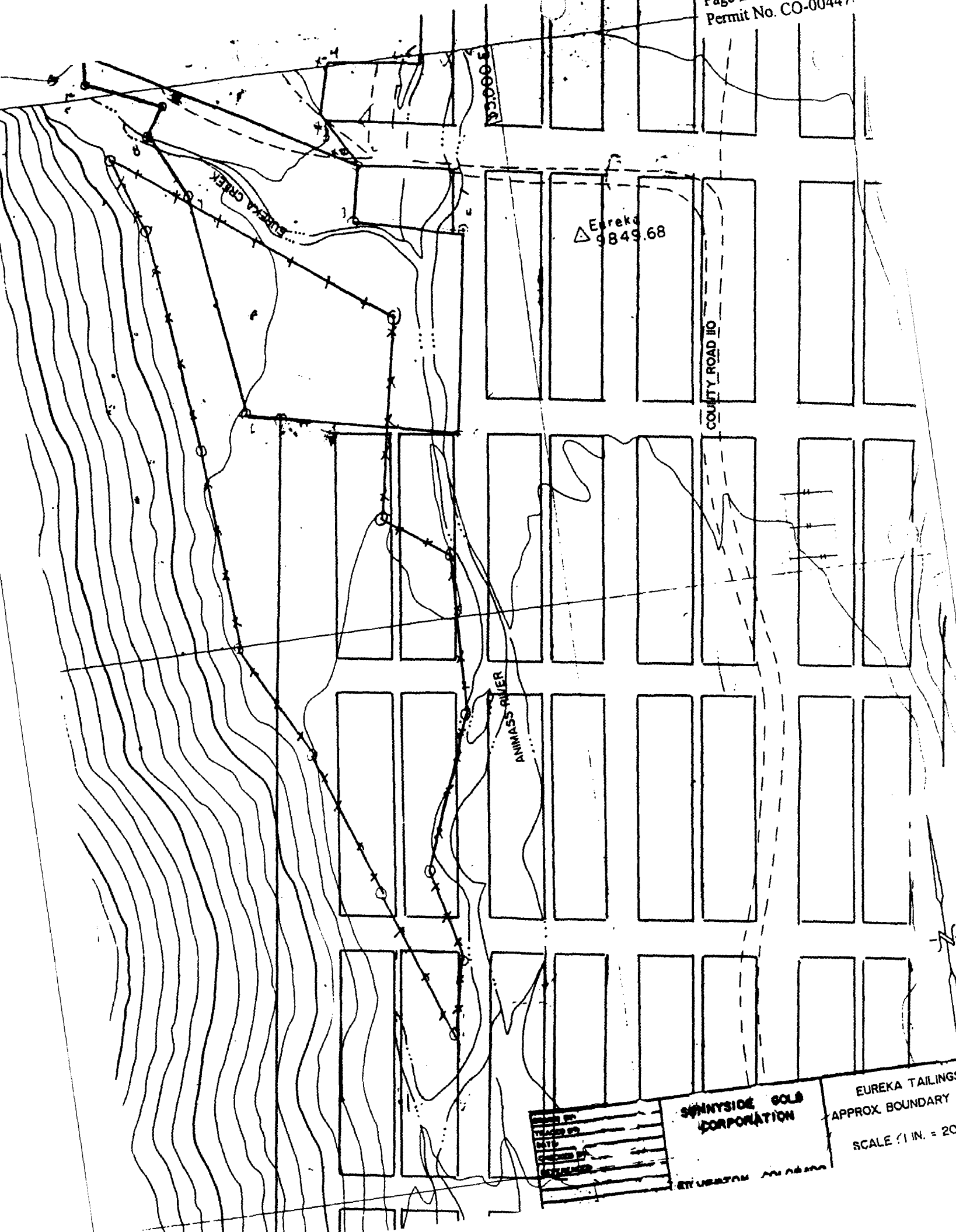
There are no other remediation plans for this property. Consolidation of the tailings material at Tailings Pond #4 is consistent with Sunnyside Gold Corporation's Colorado MLR Permit M-77-378.

[illegible]

**SURFACE MILL TALINGS AT FUREKA**

SCALE 1:50 000





93.0000

△ Eureka  
9849.68

COUNTY ROAD 110

ANIMASS RIVER

DATE	
TIME	
BY	
SCALE	
REVISION	

SUNNYSIDE GOLD  
CORPORATION

EUREKA TAILINGS  
APPROX BOUNDARY  
SCALE 1 IN. = 20

**SITE CHARACTERIZATION DATA SUMMARY**

**SITE: EUREKA TAILINGS**

**SITE CHARACTERIZATION DATA SUMMARY**

**SITE: EUREKA TAILINGS**

**MEDIA: SOILS**

Analysis Method	Sample Description	Sample Date	DATA SOURCE	pH s.u.	Al ppm	Cd ppm	Cu ppm	Fe ppm	Mn ppm	Pb ppm	Zn ppm	COMMENTS
1:1 Water Bath	Large pond tailings				<0.01	0.037	0.03	0.22	18	0.26	7.4	
Modified 1312 TCLP					<0.01	0.005	0.006	<0.05	3.82	0.08	0.72	
Total Metal Conc.				5.8	5700	7.7	520	9450	34500	6600	2070	
1:1 Water Bath					<0.01	1.02	0.56	0.12	253	1.7	85	
Modified 1312 TCLP					<0.01	1.02	0.172	0.17	14.4	4.52	7.2	
Total Metal Conc.				5.9	9000	12.3	815	14800	34500	7350	3610	



**SITE CHARACTERIZATION DATA SUMMARY**

**SITE:** EUREKA TAILINGS

**RAINFALL DATA:** Source: Silverton Weather Station

YEAR	Rainfall Inch		Snow Inch	Moisture as Snow Inch	Total Moisture Inch
June '91-May '92	09-Jan-00		134.75	11.58	21.1
June '92-May '93	09-Jan-00		260.50	12.89	22.71
June '93-May '94	07-Jan-00		130.50	10.03	17.45

Mine Remediation Plan: Gold Prince Mill Tailings  
and Waste Dump

Remediating Party: Sunnyside Gold Corporation  
P.O. Box 177  
Silverton, CO 81433

contact William B. Goodhard  
Resident Manager

**1. Description of Mining Activities**

**Physical Description of Conditions**

The site is a historic mine and mill which operated around the turn of the century. Prior to the ore being shipped to Animas Forks via aerial tram, it appears that some milling was done on site. The historic milling activity left a small tailings pond which is partially uncovered and allows for snowmelt and rain waters to cross, and potentially pass through the tailings. Waste dumps occurring on the property and bordering the stream also are not covered. The measured estimate of tailings and waste rock is 2050 cubic yards. The number one portal has a closure bulkhead in place to prevent entry; however, it needs to be reinforced to create a water retaining bulkhead. The flow through the mine workings would then be reduced as the tunnel will no longer be a natural drain for the overlying area. It is possible that the water could back up and flow into the Sunnyside Mine via old drifts and raises. This water is of similar or better quality than that projected to flow into the mine pool from other sources and the quantity is relatively insignificant in comparison. Therefore, no adverse impact would be anticipated if this were to occur.

**General Description of the Mining Site**

The site is located from Silverton, Colorado by taking CO Highway 110 towards Animas Forks, passing through The ghost town of Eureka, then up Placer Gulch, see attached location map.

The specific history of the site is not known by Sunnyside Gold Corporation. The Gold Prince was operated around the turn of the century with the ore trammed to the ghost town of Animas Forks. As evidenced by the mill foundation some milling took place onsite. The total disturbance is 2.1 acres.

**Identification of Lands**

Surface tailings pond and mine waste dumps located at head of Placer Gulch, San Juan County, Colorado. Work also to be done for closure of #1 level of Gold Prince Mine. Lands are included in SGC's Stormwater Permit #COR-040061. See attached general location map and site map.

Latitude 37 degrees 55 minutes Longitude 107 degrees 36 minutes

**Identification of the Waters of the United States Potentially Affected**

Water flows from above the property into Placer Gulch and joins the Animas River at Animas Forks. See attached map.

**2. Site Map**

Attached

## Attachment GP

Page No. GP-2

Permit No. CO-0044768

### 3. Stormwater Management Controls

Sediment catchment traps will be built to prevent water from carrying sediments to streams during the course of the project.

Relocation of the waste and tailings will be done using practices which will prevent spillage of materials.

### 4. Inspection and Record Keeping Procedures

The Manager or a member of the Technical Service Department will inspect this area on a regular basis during removal and other work activities. Reports will be prepared quarterly. After remediation work is completed, there will be periodic inspections with quarterly reporting until permit release. Prior to remediation efforts, the area will be photographed and the photographs will be submitted with the first quarterly report.

### Monitoring

Monitoring points will be upstream and downstream at this project site as well as flows from the adits and dumps. Monitoring will start prior to remediation work and continue until two years after the project is completed. Monitoring will occur four times yearly with at least one at high flow and two at low flow and will be submitted by the 28th day of the month following receipt of analysis as well as with the quarterly reports. All samples taken will be analyzed for dissolved metals Zn, Fe, Al, Cd, and CU, total sulfate, field pH as well as flow measurements.

### Reports

SGC will notify WQCD prior to work starting. Prior to installation of hydraulic seals, SGC will submit seal designs to WQCD. SGC will submit quarterly reports with photographs for this project. Once all reclamation activities are complete a final report will be submitted. Reports will be sent to Water Quality Control Division and Division of Minerals and Geology. This report will include activities to date as well as planned activities for future work.

### 5. Mine Remediation Plan

#### Legal Right to Enter and Conduct Activities

This project is on property owned by Sunnyside Gold Corporation.

#### Remedial Goals and Objectives

Cleanup of historic mill tailings and mine dumps with removal from contact with rainwater and snowmelt in order to reduce potential impact to the Animas River from heavy metals.

#### Site Loading Estimate

For all of the remediation projects, and based on limited information, the site loading estimate for each project site was based on:

##### Adits-

Using available data, zinc loading was calculated based on the average flow and average zinc values.

##### Mine Waste Dumps and Tailings Piles-

Site composite soil samples were tested using a water bath extraction. This test consists of exposing a 1:1 ratio by weight of material to deionized water. The mixture is briefly mixed then allowed to set for 30 minutes. The sample was then filtered (0.45 micron) and analyzed for metals.

Annualized loading was calculated using rainfall data (proportionally adjusted for site elevation between the Silverton and Red Mountain weather stations), exposed area of waste dump or tailings site and loading based on 1:1 water bath test results. For comparison to adit flow loadings projects, the annualized loading was converted to an average daily loading.

Based on these assumptions and procedures, SGC estimates that the average daily loading for this site may be as much as 0.4 pounds of dissolved zinc per day. SGC is under no obligation to defend these estimates and they should only be used as an estimate. SGC does not represent that its mitigation project at this site will remove any specific percentage of metals loading from this site: the loading estimate contained herein does not form the basis of an enforceable permit obligation.

#### Description of Project

The surface tailings and waste rock will be removed and consolidated and the pH adjusted to near neutral by addition of lime or limestone. A suitable relocation area for tailings and waste rock will be built onsite. The onsite relocation area will have a diversion trench established around it to isolate the material. All surface soils will be salvaged and used for final capping. Final cap thickness will depend on the amount of soil available for salvage, 14-16" minimum is preferable. Construction of the relocation site will conform as near as possible to the site topography with maximum slope ratios of 2:1. The relocation area will be located as far away from streams as practical. Once all material is consolidated, the area will be capped with the salvaged soils, amendments added, seeded and mulched. All surface disturbances will be reseeded. It is possible that a 404 permit from the Army Corps of Engineers may need to be obtained before performing this work. This plan is also subject to notification requirements, for disturbance of Historical Mining Sites, to the board of the San Juan County Commissioners.

At the portal, the closure bulkhead will be reinforced with concrete and grouted to prevent water from flowing out the portal. The tunnel would then no longer be a drain for the near surface fractures in the area. Surface disturbances will be treated with soil amendments and reseeded.

The property has some building foundations on it and may be deemed as historic. SGC will preserve these structures provided that the mine waste can be economically removed without major damage or demolition of structures.

#### Work Plan

- 1) Locate acceptable area away from stream with enough soil available for cap.
- 2) Strip and stockpile soils.
- 3) Build upland diversion ditches to prevent run on conditions.
- 4) Install catchments as needed to contain material during excavation.
- 5) Pick up and relocate waste and tailings to disposal area.
- 6) Remove catchments.
- 7) Cap relocation area with salvaged soil.
- 8) Apply soil amendments, seed and mulch all areas disturbed during project.

#### Analysis

Consolidation, improvement of pH conditions and isolation from snowmelt and rainwater is a Best Management Practice which will prevent waters from coming into contact with the tailings and mine waste rock. Preventing water from exiting the mine portal will decrease the area drained by the adit and let the near surface water return to its natural flow paths. This project may help in reducing dissolved zinc as well as other dissolved metals in the Upper Animas Basin.

#### Monitoring

Monitoring points will be upstream and downstream at this project site as well as flows from the adits and dumps. Monitoring will start prior to remediation work and continue until two years after the project is completed. Monitoring will occur four times yearly with at least one time at high flow and at least two at low flow and will be submitted by the 28th day of the month following receipt of analysis as well as with the quarterly reports. All samples taken will be analyzed for dissolved metals Zn, Fe, Al, Cd, and CU, total sulfate, field pH as well as flow measurements.

#### Contingency Plans

Removal and isolation of tailings and mine waste is planned onsite. Should this not be realistic due to groundwater conditions, SGC will haul the material to Tailings Pond #4 at the Mayflower Mill. Under SGC's MLR permit M-77-378 this material can be consolidated into Tailings Pond # 4.

#### Budget

SGC will fund this program.

Description of Land Use

This remediation work plan is intended to use Best Management Practices on the site to conform with surrounding land use policies for;

- 1) Land stabilization, limited rangeland and limited wildlife habitat to approximately resemble a mountain park ecosystem consistent with bordering undisturbed areas.
- 2) The conversion of facilities, usable for purposes other than for mining, to alternate uses and preserve facilities of historic interest.

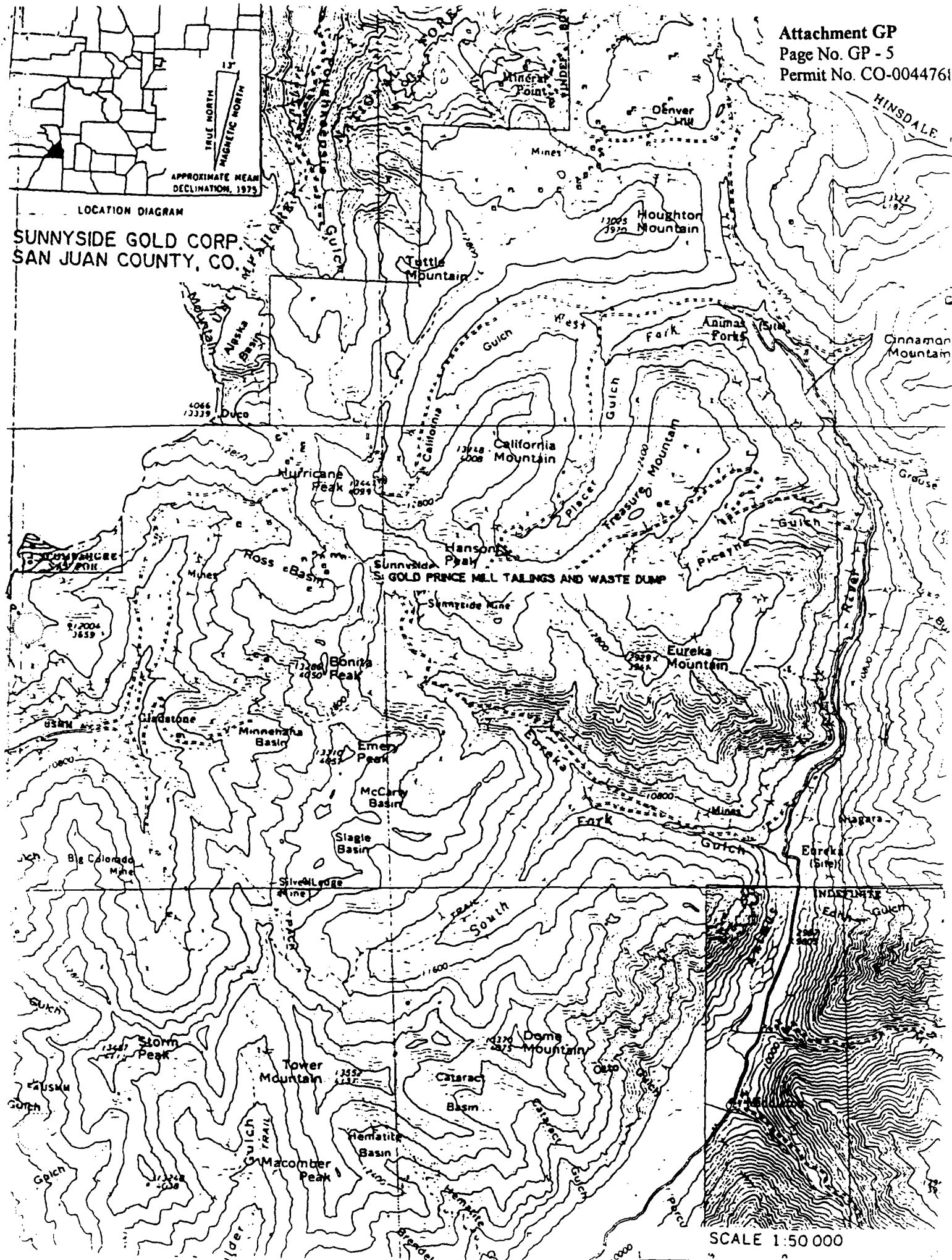
Attachment Available From WOOD upon Request

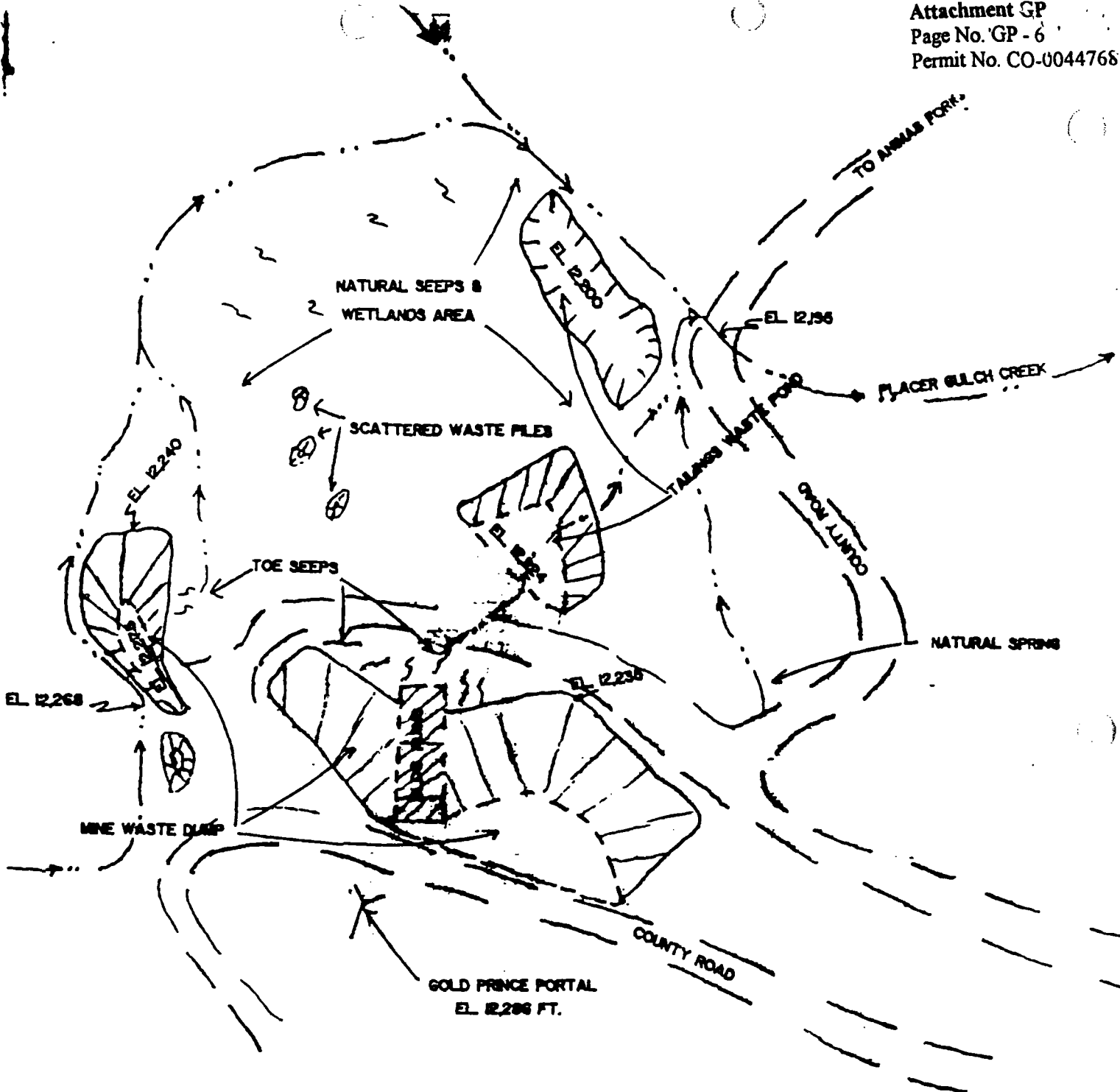
"Tunnel Bulkheads for Acid Mine Drainage", Einarson and Abel, Proc. Int'l Symp on Unique Underground Structures, 1990

6. Consistency with Other Plans

There are no other remediation plans for this property. The current stormwater permit held by Sunnyside Gold Corporation will be terminated after this permit is issued to avoid duplicity.

SUNNYSIDE GOLD CORP.  
SAN JUAN COUNTY, CO.





DATE	SUNNYSIDE GOLD CORPORATION	GOLD PRINCE MINE
DESIGNED BY		
DRAWN BY		
CHECKED BY		
APPROVED BY		
SILVERTON, COLORADO		SCALE: 1 IN. = 100 FT.

FACE RUNOFF CATCHMENT DITCH

PLAN VIEW

DISPOSAL AREA

NATURAL FLOWING CREEK

CROSS SECTION A - A'

BACKFILL CAP ~ 14 INCHES

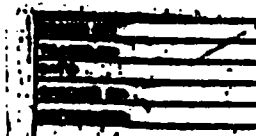
WASTE

EXCAVATION

CREEK

CATCHMENT DITCH

IDEAL WASTE DEPOSIT DISPOSAL AREA



SUNNYSIDE GOLD  
CORPORATION

GOLD PRINCE MINE

NOT TO SCALE



**SITE CHARACTERIZATION DATA SUMMARY**

**SITE: GOLD PRINCE MINE**

**SITE CHARACTERIZATION DATA SUMMARY**

**SITE: GOLD PRINCE MINE**

**MEDIA: SOILS**

Analysis Method	Sample Description	Sample Date	DATA SOURCE	pH s.u.	Al ppm	Cd ppm	Cu ppm	Fe ppm	Mn ppm	Pb ppm	Zn ppm	COMMENTS
1:1 Water Bath	Tails @ Creek				<0.1	3.02	1.35	0.05	343	2.24	99	
Modified 1312 TCLP	Tails @ Creek				<0.1	3.02	0.231	<0.05	28.4	2.9	9.4	
Total Metal Conc.	Tails @ Creek			6	7920	42	1400	19600	54200	1610	8020	
1:1 Water Bath	Light Tail Pond				<0.1	0.052	0.027	<0.05	53	<0.005	15.9	
Modified 1312 TCLP	Light Tail Pond				<0.1	0.0004	0.002	<0.05	8.4	<0.005	0.68	
Total Metal Conc.	Light Tail Pond			5.1	10800	73	1170	27500	105000	15100	19000	
1:1 Water Bath	Black Tail Pond				3.9	0.013	0.013	<0.05	16.3	<0.005	5.5	
Modified 1312 TCLP	Black Tail Pond				0.41	<0.002	0.003	<0.05	2.93	<0.005	0.56	
Total Metal Conc.	Black Tail Pond			5.7	1400	40	620	19600	59000	480	11000	

# SITE CHARACTERIZATION DATA SUMMARY

SITE: GOLD PRINCE MINE

MEDIA: WATER

Sample	Filt./Unfilt.	Flow GPM	Sample Date	pH s.u.	Al mg/l	Cd mg/l	Cu mg/l	Fe mg/l	Mn mg/l	Pb mg/l	Zn mg/l	Comments
PG-1	Filt.	22	07-Sep-94	7.76	<0.1	<0.002	0.001	<0.05	<0.02	<0.005	0.37	Mainstem above site.
PG-2	Filt.	15	07-Sep-94	7.09	0.80	<0.002	0.002	<0.05	<0.02	<0.005	0.51	Mainstem below site.
GP-2	Filt.	1	07-Sep-94	7.88	<0.1	<0.002	0.002	<0.05	0.02	<0.005	0.78	Stream across black tails.
GP Portal	Unfilt.	1	09-Aug-83	6.54		<0.002	<0.001	1.88	7.19	0.023	0.57	Adit flow
GP Portal	Filt.	0	34584	6.15	0.20	0.012	0.059	<0.05	26.9	<0.005	7.63	

**SITE CHARACTERIZATION DATA SUMMARY**

**SITE:**      **GOLD PRINCE MINE**

**RAINFALL DATA:**      **Source Idarado Mining Company--Red Mountain Weather Station**

YEAR	Rainfall		Snow	Moisture	Total
	Inch		Inch	as Snow Inch	Moisture Inch
June '91-May '92	8		444.5	35.56	43.56
June '92-May '93	8.8		545.5	49.69	58.69
June '93-May '94	7.1		330.5	26.12	33.22

**Attachment LK**  
**Page LK-1**  
**Permit No. CO-0044768**

Mine Remediation Plan: Longfellow Koehler Project

Remediating Party: Sunnyside Gold Corporation  
P.O. Box 177  
Silverton, CO 81433

contact William B. Goodhard  
Resident Manager

1) Description of Mining Activities

Physical Description of Conditions

The project area is just east of Highway 550 and just south of Red Mountain Pass, see attached location map. The climate can best be described as high alpine at timberline. The winter season is long with a very short summer season. The topography is generally steep and rugged. Elevations range from 10,400' in the valley to the south of the project to 12,400' to the east of the project area. The elevation at the project area is 11,160'.

ANNUAL MOISTURE

			MOISTURE	TOTAL
	RAINFALL	SNOW	AS SNOW	MOISTURE
YEAR	INCH	INCH	INCH	INCH
6/91-5/92	8.0	444.5	35.6	43.6
6/92-5/93	8.8	545.5	49.9	58.7
6/93-5/94	7.1	330.5	26.1	33.2

The project is located within a belt of chimney type ore deposits along the northwesterly rim of the Silverton Caldera. All volcanic rock types in this area are either from the Burns or Henson Formations. There are intrusive rocks found along the concentric and radial faults associated with the volcanic activity. The area in general is considered to be highly mineralized.

The project area consists of a shaft with a small access drift and corresponding waste dump, two collapsed discharging portals with corresponding waste dumps, two mine waste dumps (estimated to contain 20,000 cubic yards) and a low pH natural pond with sediments containing metal precipitates. All water flow through or across disturbances is exposed to pyrite and other heavy metals as well as the acidic conditions of the pond. The south collapsed adit has a general Northeasterly bearing toward Carbon Lake. The headwaters of Mineral Creek are a substantial contributor of dissolved Fe, Al and Zn as defined by the 1991-1994 sampling results of Water Quality Control Division. The site features are identified on the attached drawings.

General Description of the Mining Site

The project lies just east of Colorado Highway 550 on the south side of Red Mountain Pass. See Attached Map. This mine operated prior to the mid 1950's with the ore being shipped to a custom mill.

Identification of Lands

Mine portals, mine shaft and waste dumps located near top of Red Mountain Pass, on the east side of Colorado Highway 550, San Juan County, Colorado. See attached location and site map.

Latitude 37 degrees 54 minutes      Longitude 107 degrees 43 minutes

Identification of the Waters of the United States Potentially Impacted

Headwaters of North Mineral Creek. Mineral Creek flows into the Animas River below Silverton Colorado. See attached map.

2) Site Map

Attached

3) Stormwater Management Controls

Prior to draining of the pond, the pH will be raised to minimize the metal content of the pond water. Downstream sediment catchments will be installed to minimize downstream effects during remediation.

4) Inspection and Record Keeping Procedures

The Manager or a member of the Technical Services Department will inspect this project prior to and during remediation efforts on a regular basis. Quarterly reports and photographs will be sent to both the Colorado Water Quality Control Division and the Colorado Division of Minerals and Geology. Prior to remediation efforts the area will be photographed and the photographs will be submitted with the first quarterly report. Reports for this project will include finalized engineering drawings, with estimates of operation, maintenance and replacement requirements for a passive bio mass treatment system.

Once all reclamation activities included in the plan are complete, a final report will be submitted.

Monitoring

Monitoring points for this project will consist of upstream, downstream as well as flows from adits, seeps and dumps. Monitoring will start in 1996 and continue until two years after the project is completed. Monitoring for runoff and waste isolation will occur four times yearly, and particularly once in high flow and twice in low flow. All samples taken will be analyzed for dissolved metals Zn, Fe, Al, Mn, Cd, and Cu: total sulfate, hardness and a field pH will be taken as well as field measurements for flow. All monitoring results will be submitted by the 28th day of the month following receipt of analytical results as well as included in the quarterly reports.

5) Mine Remediation Plan

Legal Right to Enter and Conduct Activities

SGC has verbally discussed this concept in general terms with the property owner. No work will commence until an acceptable access agreement is reached.

Remedial Goals and Objectives

Reduction of dissolved zinc (70%) flowing past the M-02 sampling point at the Koehler Longfellow site on Red Mountain Pass. Actions taken to reduce dissolved zinc will also reduce low pH, metal laden waters flowing into the headwaters of North Mineral Creek by:

- (1) design of a passive bio treatment system to be given to WQCD;
- (2) reduction of acidity in the headwaters by isolating or limiting abilities of waters to react with pyrite and other sulfide minerals;
- (3) reduction of exposure to waste material by snowmelt, rainwater and intermittent streams; and
- (4) visually reclaim area to accepted reclamation standards.

Site Loading Estimate

Loading from this site is due to the intermixing of adit flows, drainage from the small basin and stormwater through a common discharge point (M-02), that has been monitored multiple times. The average results of the monitoring of M-02 for quantity and quality was used to estimate the impact of dissolved zinc from adit flows from this site. The average M-02 loading information was used and the assumption made that the same percentage attributable to waste dumps during a SGC sample session at the site is applicable to this average loading.

Based on these assumptions and procedures, SGC estimates that the average daily loading for mine waste impacts at this site may be as much as 32.5 pounds of dissolved zinc per day. SGC is under no obligation to defend these estimates and they should only be used as an estimate. SGC does not represent that its mitigation project at this site will remove any specific percentage of metals loading from this site. The loading estimate contained herein does not form the basis of an enforceable permit obligation.

Description of Project

Hydrologic Controls

Infiltration Controls

The upland property has not been examined by SGC to see if there are any open stopes, glory holes or other subsidence features that may be adding water to the portal flows. The following will be done to determine if infiltration controls have potential to reduce Adit flows.

- (1) Thorough examination of the surface looking for features which may be diverting water through mine workings.
- (2) Should any features be found they will be studied to see if run on run off controls are practicable.
- (3) SGC will implement controls such as ditching, to prevent infiltration where practicable.

Site Run On Controls

There exist two possible sites for run on controls at the portal area. The first source of water flows from the drainage area and pond to the North, around the Longfellow Shaft and contacts dump material before flowing into the lower pond at the portal area. The second source of flowing water needs to be evaluated but may be flowing from U.S. Basin. This stream flows next to the South (Koehler) Adit and contacts the dump material. Both sources can be best handled by simple diversion in a lined ditch to prevent any contact with contaminated water or mine waste material. The ditch water will be recombined below the site named M-02.

#### Mine Waste Remediation

The waste dumps will be moved and isolated from portal flows, intermittent stream flows and the pond. SGC will move and consolidate the dumps and adjust their pH to near neutral, by addition of lime, limestone or another acceptable product, for stabilization. The measured estimate of waste is 20,000 cubic yards.

Preferably an isolation site can be found onsite. As an alternative, the dumps will be relocated to SGC's Tailings Pond #4. Prior to consolidation either onsite or offsite, the pH will be adjusted to near neutral. Once removal and consolidation is completed, the material will be capped with 14-16" of soil, provided that amount of soil is available, and planted in order to prevent direct contact with water.

Surface disturbances will be pH adjusted with the use of limestone addition and planted. SGC will apply for a 404 permit from the Army Corp. of Engineers for the work in the stream.

Removal of buildings will be required on the South (Koehler) dump. This will require working with the San Juan County Historical Society. Planned activities would include historical recordation prior to removal. It is intended to leave all other structures intact including the buildings associated with the Longfellow Shaft.

#### Mine Drainage Treatment Design

Improvement in quality in the flows from the adits, natural seeps and the stormwater runoff poses a difficult problem due to the combination of low pH and high metals content. At this time it appears that the best solution is a passive bio treatment system. SGC will collect and sample waters from the underground sources to be treated. The water will be bench tested to provide data that will be used in the design of a passive bio treatment system to increase pH and reduce base metal concentrations. See attached paper on the passive bio treatment system. While SGC has agreed to complete this testing and project design, installation of an adit flow treatment project is not part of this Mine Remediation Work Plan or SGC's agreement to do mitigation projects.

#### Passive bio treatment Design Criteria

Bench scale test results will provide design parameters that will utilize the space occupied by the current pond. The design will focus on establishing the longest practicable life for the installation.

During the design stage SGC will collect additional background information monthly, when the site is accessible. Information collected will include flow, pH, temperature, dissolved metals and hardness. Dissolved metals will be limited to Zn, Fe, Al, Mn, Cd, and Cu. A field pH will be taken as well as flow measurements during sampling. These and any other results from parameters monitored for design of the system will be included in the design report given to WQCD.

Part of the design will include a monitoring program that can be used to determine metals reduction. The following will be considered in the design of the passive bio treatment system:

- (1) Volume of water to be treated. High and low flow characteristics.
- (2) Water temperature, pH and hardness.
- (3) Metal loadings and precipitation characteristics.
- (4) Retention time for passive system to react and deposit metals.
- (5) Life of passive treatment cell.
- (6) A target removal of seventy percent dissolved metals reduction from the project site.
- (7) Conceptual plan for replacement of the passive bio treatment mass.

**Attachment LK**

**Page LK-5**

**Permit No. CO-0044768**

- (8) Character of spent material.
- (9) Designed to operate with the simplest and least frequent operation and maintenance requirements.
- (10) Climate and access.

**Work Plan**  
**1996**

- (1) Evaluate baseline water quantity and quality at M-02, portals and other seeps.
- (2) Collect and bench scale test for passive bio treatment systems.
- (3) Open portals for evaluation of discharge conditions.
- (4) Determine quantity and quality to be treated by passive bio treatment system.
- (5) Examine surface subsidences for run on control.
- (6) Design run on control practices.
- (7) Design lined flow around ditches.
- (8) Design passive bio treatment system.
- (9) Investigate favorable location for onsite relocation of mine wastes.
- (10) Record historical buildings and artifacts that will be affected by this project.
- (11) Obtain permits, if needed, from San Juan County and Corps of Engineers.
- (12) Install downstream sedimentation controls to prevent pollution during reclamation.
- (13) Start and complete as much of the onsite mine waste mitigation work as possible.

**1997 and on**

- (1) Implement BMP run on controls where practicable.
- (2) Stabilize historical buildings that will remain on site.
- (3) Continue relocation of mine wastes.
- (4) Dewater settling pond and remove sediments.
- (5) Submit a completed design for a passive bio treatment system to WQCD.
- (6) Construct flow around ditches.
- (7) Reclaim and revegetate waste areas using cap for areas where relocation is not possible.
- (8) At the completion of the studies and reclamation work, SGC will provide \$200,000 to a fund as directed by WQCD, which funds will be utilized to fund water quality improvements of remedial projects to address impacts of past mining activities in the Upper Animas Basin.
- (9) Calculate loading reduction due to the waste removal / run on controls.

**Analysis**

The headwaters of North Mineral Creek currently have a low pH and are laden with heavy metals. Removal and consolidation of the mine dumps (including pH stabilization) will isolate this material from direct contact with rain waters, snow melt and flows from intermittent streams and neutralize the acid generation process already in progress. These Best Management Practices will improve the conditions of the headwaters of Mineral Creek.

Should a passive bio treatment system be installed by another Party (which installation is not part of this project) it may provide an effective approach to treatment of long term acid mine drainage and may reduce the need for and expense of active chemical treatment and minimize sludge disposal requirements.



Monitoring

Monitoring points for this project will consist of upstream, downstream as well as flows from adits, seeps and dumps. Monitoring will start in 1996 and continue until two years after the project is completed. Monitoring for runoff, runoff and waste isolation will occur four times yearly, and particularly once in high flow and twice in low flow. All samples taken will be analyzed for dissolved metals Zn, Fe, Al, Mn, Cd, and Cu; total sulfate, hardness and a field pH will be taken as well as flow measurements. All monitoring results will be submitted by the 28th day of the month following receipt of analytical results as well as included in the quarterly reports.

Budget

Sunnyside Gold Corporation will fund this project.

Description of Land Use

This remediation work plan is intended to use Best Management Practices on the site to conform with surrounding land use policies for:

- 1) Land stabilization, limited rangeland and limited wildlife habitat to approximately resemble a mountain park ecosystem consistent with bordering undisturbed areas
- 2) The conversion of facilities, usable for purposes other than for mining, to alternate uses and preserve facilities of historic interest.

Contingency Plans

Prior to draining of the pond, the pH will be raised to minimize the metal content of the pond water. Downstream sediment catchments will be installed to minimize downstream effects during remediation.

If a favorable onsite location cannot be found for onsite relocation of mine wastes, the mine wastes will be trucked to SGC's Tailings Pond #4 at the Mayflower Mill. Under SGC's MLR permit (M-77-378) this material can be consolidated into Tailings Pond #4.

6) Consistency with Other Plans

There are no other remediation plans for this project. If consolidation of the waste is trucked to SGC's Tailings Pond #4, this would be a compatible use of the Tailings Pond as approved under SGC's MLR permit (M-77-378).

Water Standards and Use Classification

Identification

The Koehler / Longfellow area drains into Mineral Creek, Segment 8 of the Animas and Florida Sub-basin of the San Juan River. Segment 8 in turn flows into Segment 9b which flows into Segments 4a, 4b, 5a which are Animas River mainstem segments extending to the Southern Ute Indian Reservation boundary.

Classification

Segment 8 is designated as Use Protected and is classified for the following uses:  
Recreation, Class 2; Agriculture.

Numeric Standards: Segment 8

The standards below can be found in 3.4. classifications and Numeric Standards for the San Juan River Basin (Secr 1002-8)

Physical and Biological Standards

pH 4.5-9.0 s.u.

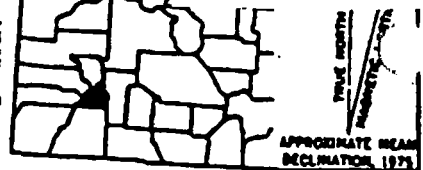
Fecal Coliforms = 200/100 ml

Metals

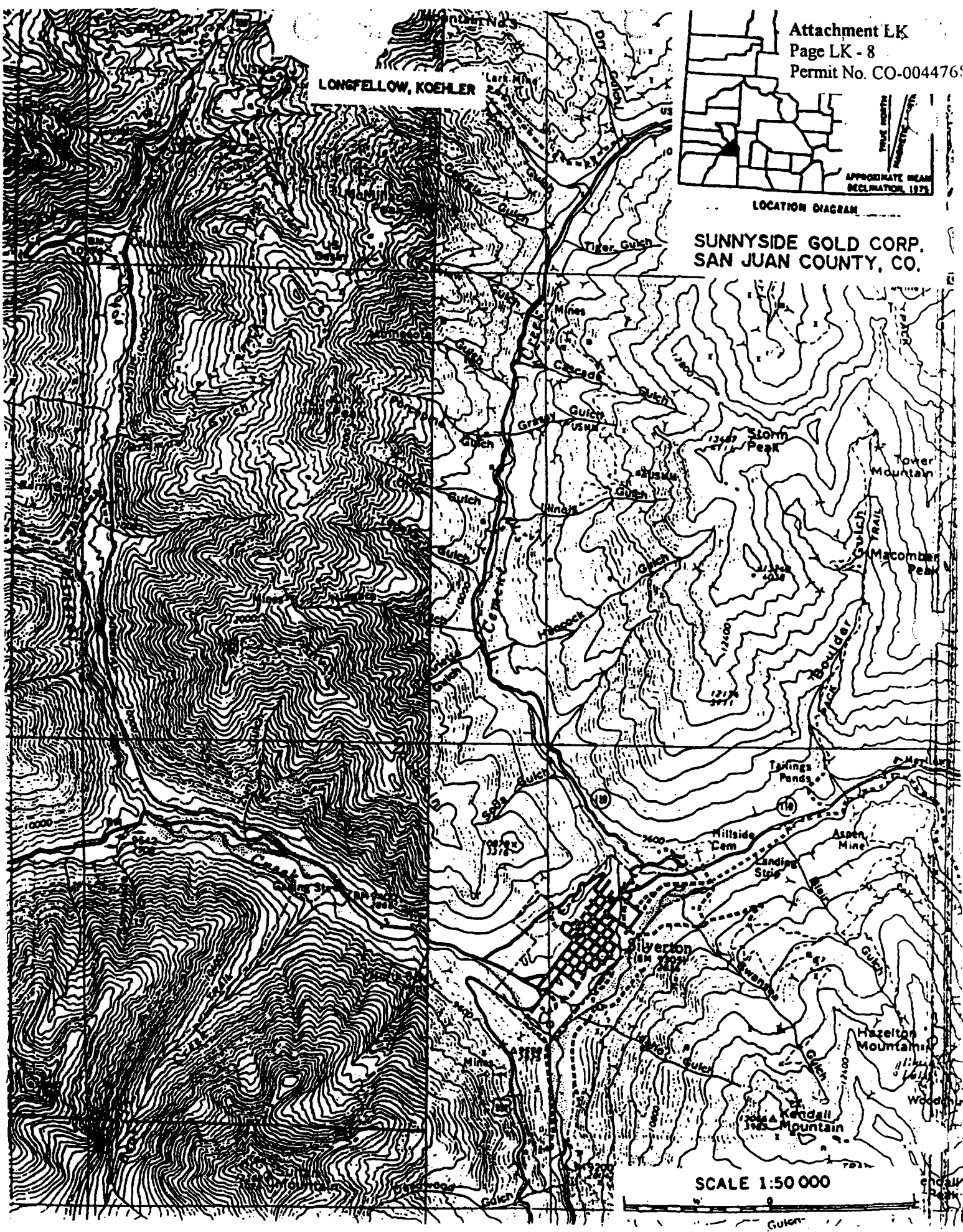
Effective until March 2, 1998 all metals standards have been set equal to the existing ambient quality as of February 14, 1995. Effective as of March 2, 1998 the concentration of dissolved aluminum, cadmium, copper, iron, lead, manganese and zinc that is directed toward maintaining and achieving water quality standards in segments 4a, 4b, and 9b of the Animas Basin.

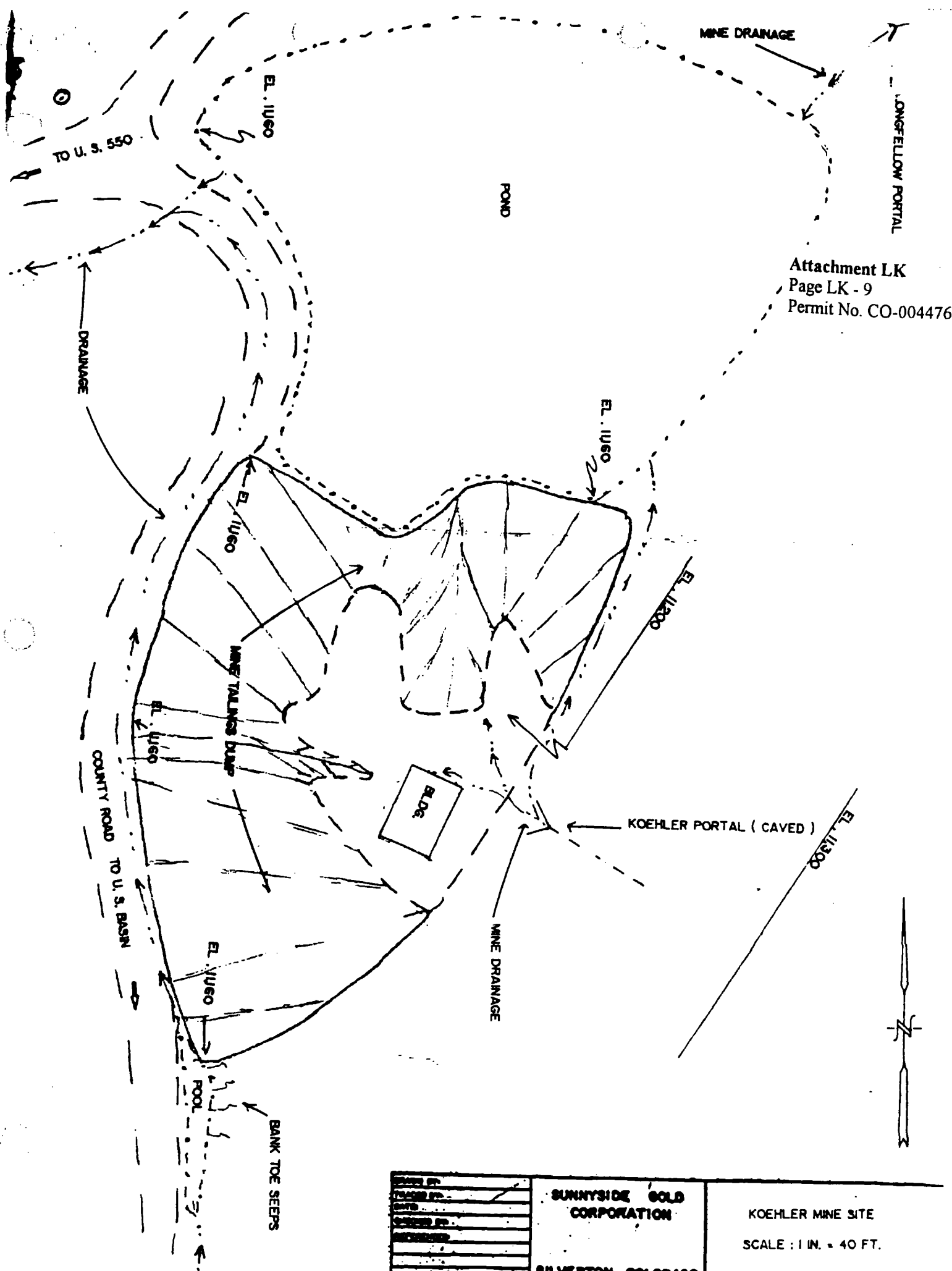
Attachments Available From the WOCD Upon Request

Design concept for the closure for the Longfellow Koehler Mine Complex



SUNNYSIDE GOLD CORP.  
 SAN JUAN COUNTY, CO.





Attachment LK  
 Page LK - 9  
 Permit No. CO-004476

EL. 11600	EL. 11400	EL. 11500	EL. 11300
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SUNNYSIDE GOLD CORPORATION  
 SILVERTON, COLORADO

KOEHLER MINE SITE  
 SCALE : 1 IN. = 40 FT.

## LOW-LOW PORTAL

## LOW-LOW PORTAL

Attachment LK  
Page LK - 10  
Permit No. CO-004476

Page LK - 10

Permit No. CO-004476

TO U. S. 550

**Ex. 1460**

**FOND**

## DRAINAGE

EL: 1168

7/14/60

many tallies bump

der: 12

COUNTY ROAD TO U. S. BASIN

0911-24

**Pool**

## BANK TOE SHEEPS

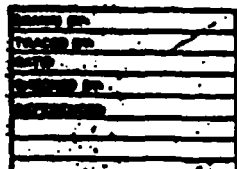
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COEHLER PORTAL ( CAVED )

## NAME DRAINAGE

~~EL-11200~~

EL-11308



**SUNNYSIDE GOLD  
CORPORATION**

**SILVERTON. COLORADO**

KOEHLER MINE SITE

SCALE : 1 IN. = 40 FT.

SITE CHARACTERIZATION DATA SUMMARY

SITE: KOEHLER/LONGFELLOW

SITE CHARACTERIZATION DATA SUMMARY

SITE: KOEHLER/LONGFELLOW

MEDIA: SOILS

Analysis Method	Sample Description	Sample Date	DATA SOURCE	pH s.u.	Al ppm	Cd ppm	Cu ppm	Fe ppm	Mn ppm	Pb ppm	Zn ppm	COMMENTS
Modified 1312 TCLP	Dump 1	34919	CDPHE		2.7	0.022	2.6	51	0.049	3.1	4.2	
Modified 1312 TCLP	Dump 2	34919	CDPHE		3.2	0.014	2.2	26	0.032	4.4	4.1	
Modified 1312 TCLP	Dump 3	34919	CDPHE		7.9	0.011	5.2	67	0.02	3.8	3.6	
Modified 1312 TCLP	Dump 4	34919	CDPHE		0.19	<0.004	0.49	1.1	0.018	1.8	0.67	
Modified 1312 TCLP	Dump 5	34919	CDPHE		4.3	0.075	2	24	0.28	0.76	14	
1:1 Water Bath	Longfellow Dump	34554	SGC		51.6	0.158	21.1	535	76.2	2.95	50.6	
Modified 1312 TCLP	Longfellow Dump	34554	SGC		3.58	0.007	0.703	24	2.63	4.86	1.8	
Total Metal Conc.	Longfellow Dump	34554	SGC	1.7	3080	113	7570	106000	307	20800	10400	Composite dump sample
1:1 Water Bath	Pond Sediments	34554	SGC		29.00	0.113	0.407	51	80.5	1.24	20	
Modified 1312 TCLP	Pond Sediments	08-Aug-94	SGC		1.21	0.011	0.547	2.93	8.8	0.427	2.18	
Total Metal Conc.	Pond Sediments	08-Aug-94	SGC	2.9	6310.00	33	588	78100	1140	1520	1720.00	

SITE CHARACTERIZATION DATA SUMMARY

SITE: KOEHLER/LONGFELLOW

MEDIA: WATER

Sample	Filt/Unfilt	Flow GPM	Sample Date	DATA SOURCE	pH s.u.	Al mg/l	Cd mg/l	Cu mg/l	Fe mg/l	Mn mg/l	Pb mg/l	Zn mg/l	Comments
M01	Unfilt	180	06-Sep-91	CDPHE	5.77	<	<	<	0.022	<	<	<	Headwater sample of Mineral Creek.
	Filt		06-Sep-91	CDPHE		<	<	<		<	<	<	
	Unfilt		23-Jun-92	CDPHE	7.04	<	<	0	0.014	<	<	<	
	Filt		24-Jun-92	CDPHE		<	<	<	<	<	<	0.01	
	Unfilt	13	14-Oct-92	CDPHE	6.85	<	<	0.005	0.028	<	<	0.04	
	Filt		14-Oct-92	CDPHE		<	<	<		<	<	0.02	
LFK07	Unfilt	2.244	34920	CDPHE	7.43	0.19	<	0.014	0.78	0.08	0.003	0.011	Background site upgradient from Longfellow Shaft
	Filt		34920	CDPHE		<	<	0.011	0.16	0.036	<	0.009	
RML-BG/ LFK07	Filt	5	34557	SGC	7.97	<0.1	<0.002	0.01	0.07	0.01	<0.005	<0.01	
M02	Unfilt	226.1952	33487	CDPHE	2.63	67	0.63	62	490	17	0.3	180	Combined flow from the Koehler/ Longfellow complex.
	Filt		33487	CDPHE		67	0.63	62	490	17	0.3	180	
	Unfilt		33778	CDPHE	2.81		0.21	18	180		0.11	54	
	Filt		33778	CDPHE		14	0.15	14		3	0.088	40	
	Unfilt		33891	CDPHE	3		0.81	82	580		0.099	230	
	Filt		33891	CDPHE		85	0.81	82		26	0.101	230	
	Unfilt		34171	CDPHE	2.79		0.35	33	290		0.088	100	
	Filt	43.5336	34171	CDPHE		37	0.35	33	280	12	0.09	100	
	Unfilt	9.4248	08/08/95	CDPHE	2.44	52	0.45	53	420	14	0.073	130	
	Filt		34920	CDPHE		51	0.44	52	420	14	0.069	130	
	Unfilt	9.4248	10/05/95	CDPHE	2.84	130	1	110	910	37	0.28	310	
	Filt		34977.10528	CDPHE		60	0.45	54	430	17	0.14	140	
KDP-COM/ M02	Filt	14.8	34554.11569	SGC	2.26	76	0.33	58.9	427	27.6	0.24	167	
M34	Unfilt	15214.32	33486	CDPHE	6.17	2.2	0.0013	0.08	2.9	0.33	0.013	0.39	Mainstem Mineral Creek @ gaging station.
	Filt		33486.0	CDPHE		<	0.0	0.0	0.9	0.33	<	0.36	
	Unfilt	40077.84	33487.0	CDPHE	6.7	3.0	0.0	0.1	4.4	0.26	0.019	0.33	
	Filt		33487.0	CDPHE		0.7	0.0	0.0	1.4	0.25	<	0.28	
	Unfilt	52734	33488.0	CDPHE	7.1	1.4	0.0	0.1	2.6	0.18	0.012	0.24	
	Filt		33488	CDPHE		0.071	0.0008	<	0.44	0.17	<	0.22	
	Unfilt	50359.848	33490	CDPHE	6.75	0.9	0.0008	0.031	1.4	0.15	0.005	0.18	
	Filt		33490	CDPHE		<	0.0008	0.005	0.61	0.15	<	0.18	
	Unfilt	48560.16	33491	CDPHE	7.4	1.2	0.0008	0.08	1.8	0.17	0.006	0.2	
	Filt		33491	CDPHE		0.075	0.0008	<	0.5	0.16	<	0.18	
	Unfilt	157080	33778	CDPHE	7.2		0.00074	0.008	0.19		<	0.094	
	Filt		33778	CDPHE		<	0.00075	0.008	0.13	0.074	<	0.11	
	Unfilt	149899.2	33779	CDPHE	7.2		0.0009	0.029	0.97		0.007	0.15	
	Filt		33779	CDPHE		<	0.00077	0.007			<	0.12	
	Unfilt	152592	33780	CDPHE	7.1								
	Filt	14361.6	33891	CDPHE	6		0.0014	0.055	4.8		0.0093	0.4	
	Unfilt		33891	CDPHE		<	0.0013	0.016	3.4	0.41	<	0.39	

SITE CHARACTERIZATION DATA SUMMARY

SITE: KOEHLER/LONGFELLOW											
	Filt	13912.8	33892	CDPHE	6.1		0.0013	0.054	4.5	0.0074	0.39
	Unfilt		33892	CDPHE		<	0.0013	0.018	3.1	<	0.37
	Unfilt	78540	34170	CDPHE	7.4		0.00043	0.035	0.91	<	0.12
	Filt		34170	CDPHE		<	0.00042	<	0.4	<	0.16
	Unfilt	78540	34171	CDPHE	6.75		0.00057	0.016	0.9	<	0.12
	Filt		34171	CDPHE		<	0.00043	<	0.26	0.11	0.1
A72											
	Unfilt	58792.8	33486	CDPHE	6.2	1.2	0.0014	0.029	1.5	0.55	0.41 Mainstem Animas River @
	Filt		33486	CDPHE		<	0.0014	0.005	0.39	0.55	0.38 gaging station below Silverton.
	Unfilt	83028	33487	CDPHE	6.3	1.8	0.0015	0.05	2.7	0.56	0.43
	Filt		33487	CDPHE		0.077	0.0014	<	0.37	0.54	<
	Unfilt	117136.6	33488	CDPHE	6.86	1.1	0.0012	0.037	2	0.43	0.35
	Filt		33488	CDPHE		0.11	0.0011	0.008	0.46	0.42	<
	Unfilt	120727.2	33490	CDPHE	6.42	0.79	0.0011	0.02	1.2	0.29	0.005
	Filt		33490	CDPHE		<	0.0011	<	0.48	0.29	<
	Unfilt	118034.4	33491	CDPHE	6.35	1	0.0012	0.028	1.5	0.36	0.011
	Filt		33491	CDPHE		0.07	0.001	<	0.25	0.34	<
	Unfilt	383275.2	33778	CDPHE	7.4	<	0.0016	0.008	0.078	<	0.24
	Filt		33778	CDPHE		<		0.007	0.042	0.35	<
	Unfilt	392251.2	33779	CDPHE	7.2		0.0017	0.035	0.95		0.012
	Filt		33779	CDPHE		<		0.008			<
	Unfilt	357693.6	33780	CDPHE	7.2						0.28
	Filt		33780	CDPHE		<		0.006		0.36	<
	Unfilt	35904	33891	CDPHE	6.3						0.26
	Filt		33891	CDPHE		<	0.0015	0.006		0.88	<
	Unfilt	35006.4	33892	CDPHE	6.8		0.0013	0.028	3		0.48
	Filt		33892	CDPHE		0.052	0.0012	0.005	1.7	0.94	0.0063
	Unfilt	194779.2	34170	CDPHE	7.4		0.00097	0.019	0.75	0.33	<
	Filt		34170	CDPHE		<	0.00089	0.008	0.19		<
	Unfilt	194779.2	34171	CDPHE	6.73		0.00097	0.019	0.74		<
	Filt		34171	CDPHE		<	0.00096	0.005	0.24		<
LFK01											
	Unfilt		34920	CDPHE	2.87	9.5	0.047	1.3	95	2	0.78
	Filt		34920	CDPHE		9.2	0.047	1.3	89	2	0.68
	Unfilt	2.244	34977	CDPHE	3.48	13	0.058	2	120	3.3	1
	Filt		34977	CDPHE		12	0.055	1.9	110	3	0.86
M2a/LFK01 Filt											
		143.616	34171	CDPHE	3.35	5.7	0.035	1.2	57		0.3
PorA/LFK01 Filt											
		1.15	34554	SGC	2.5	13.2	0.47	1.7	158	2.7	1.5
K-BG											
	Filt		34557	SGC	6.88	12	0.05	1	1.91	18	0.06
LFK03											
	Unfilt	2.6928	34920	CDPHE	2.36	52	0.54	65	480	14	0.086
	Filt		34920	CDPHE		52	0.54	64	480	14	0.086
	Unfilt	4.468	34977	CDPHE	2.7	39	0.41	50	330	14	0.04
	Filt		34977	CDPHE		31	0.31	40	250	12	0.029
M2c/LFK03 Filt											
		2.244	34171	CDPHE	3.01	20	0.25	23	160		0.17
LFK04											
	Unfilt	0.4488	34920	CDPHE	2.29	57	0.47	51	450	15	0.07
	Filt		34920	CDPHE		56	0.46	51	440	15	0.075



# SITE CHARACTERIZATION DATA SUMMARY

SITE: KOEHLER/LONGFELLOW

M2b/LFK04 Filtr		3.1416	34171	CDPHE	2.77	47	0.62	63	520		0.17	180
K-Port Filtr			34554	SGC	1.81	85	0.86	109	834	29.7	0.53	290 South (Koehler) adit pool
LFK06 Unfilt		0.4488	34920	CDPHE	2.35	54	0.81	0.71	540	15	0.14	180 Flow on the NE side of South (Koehler)
Filtr			34920	CDPHE		54	0.81	0.71	540	14	0.12	180 dump. Suspected adit flow.
KD-2/LFK05 Filtr		2	34554	SGC	2.19	88	0.45	104.1	804	26.5	0.19	262
LFK08 Unfilt		1.3464	34920	CDPHE	3.08	2.5	0.009	0.6	13	1.8	0.69	1.6 Combined stream above North
Filtr			34920	CDPHE		2.4	0.01	0.6	12	1.8	0.89	1.6 (Longfellow) adit flow.
Unfilt		3.5904	34977	CDPHE	4.3	1.8	0.008	0.49	7.4	0.58	0.45	1.7
Filtr			34977	CDPHE		1.7	0.007	0.5	5.2	0.58	0.4	1.6
LFK09 Unfilt		9.4248	34920	CDPHE	2.51	31	0.24	27	230	9.1	0.35	72 Discharge from pond between
Filtr			34920	CDPHE		32	0.26	28	230	9.3	0.33	76 North (Longfellow) and South
Unfilt		8.976	34977	CDPHE	2.98	57	0.58	68	480	18	0.11	170 (Koehler) dumps.
Filtr			34977	CDPHE		56	0.52	67	470	18	0.088	160
KP-1/LFK05 Filtr		6.6	34554	SGC	2.34	76	0.49	81.3	461	24.7	0.3	172
LFK10 Filtr		9.4248	34920	CDPHE	2.44	51	0.44	52	420	14	0.069	130
KD-1/LFK11 Filtr		2.93	34554	SGC	2.31	58.7	0.17	56.5	339	25.1	0.19	150
LFK11 Unfilt		1.3464	34920	CDPHE	2.13	58	0.64	78	610	16	0.23	190 South (Koehler) adit.
Filtr			34920	CDPHE		58	0.64	77	610	16	0.23	190
Unfilt		0.71808	34977	CDPHE	2.56	93	1.1	140	990	26	0.29	330
Filtr			34977	CDPHE		95	0.97	140	990	26	0.29	320

Mine Remediation Plan: London Mine Portals

Remediating Party: Sunnyside Gold Corporation  
P.O. Box 177  
Silverton, CO 81433

contact William B. Goodhard  
Resident Manager

### 1. Description of Mining Activities

#### Physical Description of Conditions

There are up to five portals in the area, three which appear to discharge continuously and two discharge during high runoff, two waste dumps and a shaft. Water flowing from these areas is low in pH and appears to carry dissolved metals. The dumps are exposed to rainwater and snowmelt as well. The regional geology is volcanic rocks with narrow veins containing base metals; Fe, Pb, Cu and Zn. Sampling of the waters in this area indicates that even though the portal discharges are small, there is a substantial increase in dissolved metal loading to Burrows Creek.

#### General Description of the Mining Site

The history, including dates of operation, of this property is not known by Sunnyside Gold Corporation. However it is easy to see that this property is very old as evidenced by the condition of the property. This surface disturbance is approximately 0.5 acres.

#### Identification of Lands

The London mine is located in Burrows Gulch to the North of Houghton Mountain, San Juan County, Colorado. See attached location and site map.

#### Identification of the Waters of the United States Potentially Affected

Burrows Creek is above the confluence with the North Fork of the Animas River. See attached location map.

### 2. Site Map

Attached

### 3. Stormwater Management Controls

Prior to any work taking place on the property, Sunnyside will install sediment catchment traps to minimize impacts from sediments entering the waters of the State.

### 4. Inspection and Record Keeping

The Manager or a member of the Technical Services Department will inspect this property on a regular basis while the work is being done and periodically until the permit is released. Quarterly reports with photographs will be submitted to both the Water Quality Control Division and The Colorado Division of Minerals and Geology. Photographs of the property prior to remediation will be submitted with the first quarterly report.

#### Monitoring

Monitoring points will be upstream and downstream at this project site as well as flows from the adits and dumps. Stream sampling for this project will occur in Burrows Creek. Monitoring will start prior to remediation work and continue until two years after the project is completed. Monitoring will occur four times yearly with one at high flow and

**Attachment LM**  
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two at low flow and will be submitted by the 28th day of the month following receipt of analysis as well as with the quarterly reports. All samples taken will be analyzed for dissolved metals Zn, Fe, Al, Mn, Cd, and Cu, total sulfate, hardness, a field pH as well as flow measurements.

**Reporting**

Should this project become necessary to maintain water quality in the Upper Animas, SGC will notify WQCD prior to work starting. Prior to installation of hydraulic seals in the adits, SGC will submit seal designs to WQCD. SGC will submit quarterly reports for this project. Once all reclamation activities are complete, a final report will be submitted. Reports will be sent to the Division of Minerals and Geology as well as the Water Quality Control Division. The report will include activities to date as well as planned activities for future work.

**5. Mine Remediation Plan**

**Legal Right to Enter and Conduct Activities**

SGC has not contacted the property owner. No contact will be initiated until substantial agreement is reached with WQCD concerning remediation projects. No work will commence until proper permission is granted.

**Remedial Goals and Objectives**

Reduction of low pH, metal laden waters flowing into the West Fork of the Animas River at Animas Forks by:

- 1) reduction of acidity in the headwaters through limiting the quantity of waters reacting with pyrite and other sulfide minerals.
- 2) reduction of exposure to waste material by snowmelt and rainwater.
- 3) visually reclaim area while preserving historic aspects.

**Site Loading Estimate**

For all of the remediation projects, and based on limited information, the site loading estimate for each project site was based on the following methodology:

**Adits-**

Using available data, zinc loading was calculated based on the average flow and average zinc values.

**Mine Waste Dumps and Tailings Piles-**

Site composite soil samples were tested using a water bath extraction. This test consists of exposing a 1:1 ratio by weight of material to deionized water. The mixture is briefly mixed then allowed to set for 30 minutes. The sample was then filtered ( 0.45 micron) and analyzed for metals.

Annualized loading was calculated using rainfall data (proportionally adjusted for site elevation between the Silverton and Red Mountain weather stations), exposed area of waste dump or tailings site and loading based on 1:1 water bath test results. For comparison to adit flow loadings projects, the annualized loading was converted to an average daily loading.

Based on these assumptions and procedures, SGC estimates that the average daily loading for this site may be as much as 12.2 pounds of dissolved zinc per day. SGC is under no obligation to defend these estimates and they should only be used as an estimate. SGC does not represent that its mitigation project at this site will remove any specific percentage of metals loading from this site: the loading estimate contained herein does not form the basis of an enforceable permit obligation.

**Description of Project**

The waste dumps will be isolated from portal flows as well as stormwater events. The dumps will be regraded and hydrologic diversions installed to prevent run on conditions. The dumps would then be stabilized with basic pH material and revegetated to minimize percolation from stormwater events.

The portals will be opened and studied for the placement of hydraulic seals. In order for hydraulic seals to be placed, SGC feels that sites meeting the following conditions need to be found.

- 1) Location far enough underground to avoid the near surface fractures and joints caused by weathering.

- 2) Adequate rock compressive strength for structural stability.
- 3) A length of the tunnel with minimal faulting or other geologic features that may serve as a leakage pathway.
- 4) Adequate ground cover over the potential site to resist the hydrostatic forces from the potential maximum head.

If an acceptable location can be found, SGC will design and install two hydraulic seals. After sealing is complete, the seal will be contact grouted and the diversion pipes, if necessary for construction, grouted. The near surface fracture flows typically found will be diverted to avoid contact with waste material and the portal closed. Design of hydraulic seals will be according to current engineering practices. The design approach will be similar to the attached paper on Tunnel Bulkheads.

This plan is also subject to notification requirements for disturbance of Historical Mining Sites to the board of the San Juan County Commissioners.

#### Work Plan

- 1) Build catchments for potential adit releases.
- 2) Open and evaluate adits for hydraulic seals.
- 3) Design and install hydraulic seals.
- 4) Grout seals and bypass pipes.
- 5) Portal closure.
- 6) Surface diversions and dump regrading.
- 7) Addition of pH neutralizing material, seeding and mulching.

#### Analysis

Diversion and isolation of the mine dumps (including pH stabilization) will isolate this material from direct contact with run on and intermittent flows and minimize infiltration from stormwater events. This will improve water quality of the Burrows Creek above Animas Forks.

The hydraulic seals proposed for the London Mine Adits will reduce the unsaturated zone by removing the drain. This will result in minimizing the oxygen available for reaction with the sulfide materials in the area. The hydrological conditions will be restored to an approximation of pre mining conditions.

#### Contingency Plans

Should the concept of hydraulic seals not be practical after engineering studies, SGC will consult with the Division of Minerals and Geology and WQCD for other mine drainage mitigation alternatives. If an acceptable system can be arrived at, SGC will install such a system.

Catchments will be provided in order to prevent impact to Burrows Creek during excavation prior to opening portals.

#### Monitoring

Monitoring points will be upstream and downstream at this project site as well as flows from the adits and dumps. Stream sampling for this project will occur in Burrows Creek. Monitoring will start prior to remediation work and continue until two years after the project is completed. Monitoring will occur four times yearly with one at high flow and two at low flow and will be submitted by the 28th day of the month following receipt of analysis as well as with the quarterly reports. All samples taken will be analyzed for dissolved metals Zn, Fe, Al, Mn, Cd, and Cu, total sulfate, hardness, a field pH as well as flow measurements.

#### Budget

SGC will fund this project.

Description of Land Use

This remediation work plan is intended to use Best Management Practices on the site to conform with surrounding land use policies for:

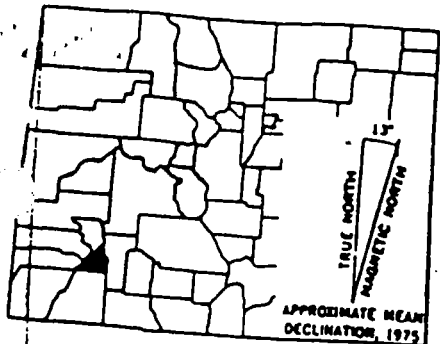
- 1) Land stabilization, limited rangeland and wildlife habitat to approximately resemble a mountain park ecosystem consistent with bordering undisturbed areas.
- 2) The conversion of facilities, usable for purposes other than for mining, to alternate uses and preserve facilities of historic interest.

Attachment Available From WOCD Upon Request

"Tunnel Bulkheads for Acid Mine Drainage", Einarson and Abel, Proc Int'l Symp on Unique Underground Structures, 1990

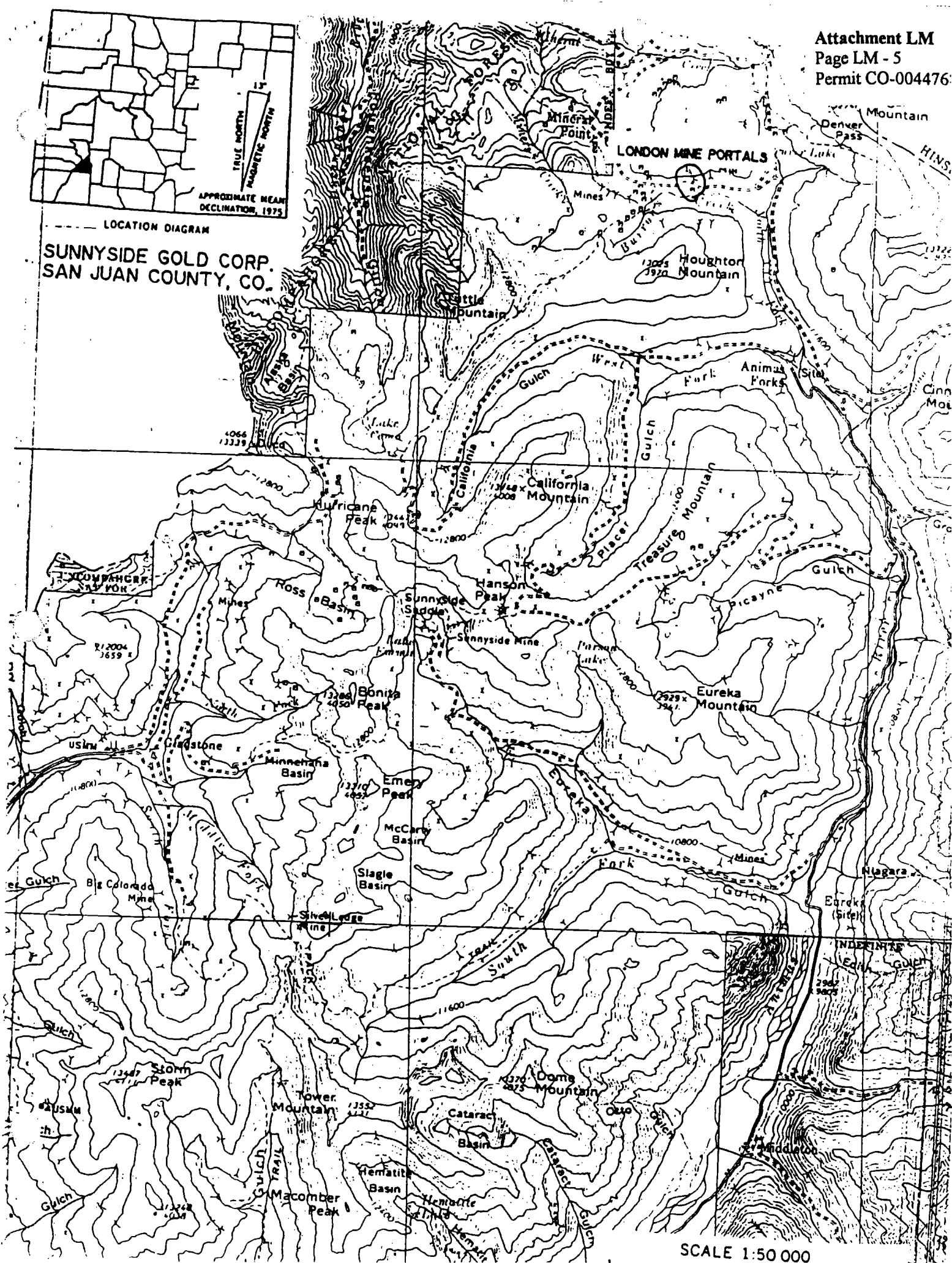
6. Consistency with Other Plans

There are no other remediation plans for this property.

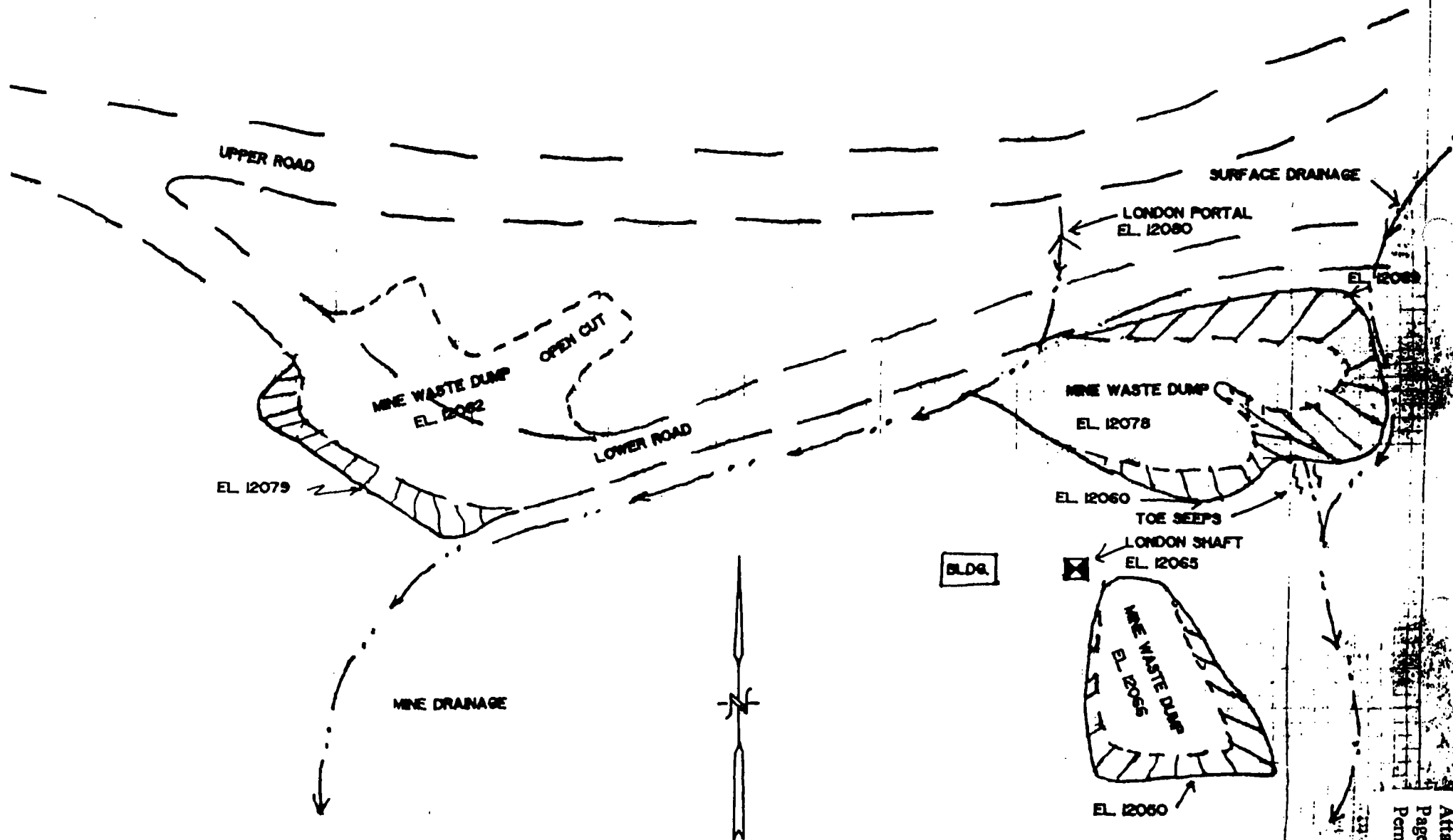


LOCATION DIAGRAM

SUNNYSIDE GOLD CORP.  
SAN JUAN COUNTY, CO.



SCALE 1:50 000



	SURFACE DRAINAGE CONSTRUCTION	LONDON SHAFT CONSTRUCTION
	SCALE: 1" = 100'	DATE: 1/1/66

**SITE CHARACTERIZATION DATA SUMMARY**

**SITE:** LONDON MINE

**SITE CHARACTERIZATION DATA SUMMARY**

**SITE:** LONDON MINE

**MEDIA:** WATER

Sample	Filt./Unfilt.	Flow GPM	Sample Date	DATA SOURCE	pH s.u.	Al mg/l	Cd mg/l	Cu mg/l	Fe mg/l	Mn mg/l	Pb mg/l	Zn mg/l	Comments
A07LM	Unfilt Filt		20-Jul-93	CDPHE	6.39	<	0.0107	0.009	0.047	1.4	<	8.70	



# **SITE CHARACTERIZATION DATA SUMMARY**

**SITE:** LONDON MINE

**RAINFALL DATA:** Source Silverton Weather Station

YEAR	Rainfall inch		Snow inch	Moisture as Snow inch	Total Moisture inch
June '91-May '92	9.55		134.75	11.58	21.1
June '92-May '93	9.82		280.5	12.89	22.71
June '93-May '94	7.42		130.5	10.03	17.45

**RAINFALL DATA:** Source Idarado Mining Company--Red Mountain Weather Station

YEAR	Rainfall inch		Snow inch	Moisture as Snow inch	Total Moisture inch
June '91-May '92	8.0		444.5	35.6	43.6
June '92-May '93	8.8		545.5	49.9	58.7
June '93-May '94	7.1		330.5	26.1	33.2

Mine Remediation Plan: Pride of the West Tailings

Remediating Party: Sunnyside Gold Corporation  
P.O. Box 177  
Silverton, CO 81433

contact William B. Goodhard  
Resident Manager

**1. Description of Mining Activities**

**Physical Description of Conditions**

An old tailings pond, pre Reclamation Act, is exposed to rainwater, stormwater and groundwater springs under and near the tailings. Exposure of these materials to water should be controlled. There is a total measured estimate of 64,000 cubic yards.

**General Description of the Mining Site**

The historic, pre reclamation law, tailings are located at Howardsville, San Juan County, Colorado. The site is accessed by taking Colorado Highway 110 north of Silverton. The tailings were placed here in the late 1950's and 1960's.

The total disturbed area is approximately 3.9 acres.

**Identification of Lands**

Historic pre Reclamation Act tailings at the old townsite of Howardsville, San Juan County Colorado. See attached location and site maps.

**Identification of the Waters of the United States Potentially Affected**

Cunningham Creek and Animas River at and above confluence. See attached site map.

**2. Site Map**

Attached

**3. Stormwater Management Controls**

Sediments traps will be created as needed below the project to prevent tailings from being washed into the Animas River or Cunningham Creek. The traps will be cleaned and removed when no longer necessary for the project.

**4. Inspection and Record Keeping Procedures**

The Manager or a member of the Technical Service Department will inspect this property on a regular basis while the work is being done and periodically until the permit is released. Quarterly reports with photographs will be submitted to both the Water Quality Control Division and the Colorado Division of Minerals and Geology. Photographs of the property prior to remediation will be submitted with the first quarterly report.

**5. Mine Remediation Plan**

**Legal Right to Enter and Conduct Activities**

SGC has not contacted the property owner concerning this project. No contact will be initiated until substantial agreement on remediation projects is reached with WQCD. No work will commence until proper permission is granted.

**Remedial Goals and Objectives**

Cleanup of historic tailings, removal from contact with flowing water, severing existing direct connections to the river in order to reduce the impacts to the Animas River from dissolved metals.

**Attachment PW**  
**Page PW-2**  
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Site Loading Estimate

For all of the remediation projects, and based on limited information, the site loading estimate for each project site was based on the following methodology:

Adits-

Using available data, zinc loading was calculated based on the average flow and average zinc values.

Mine Waste Dumps and Tailings Piles-

Site composite soil samples were tested using a water bath extraction. This test consists of exposing a 1:1 ratio by weight of material to deionized water. The mixture is briefly mixed then allowed to set for 30 minutes. The sample was then filtered ( 0.45 micron) and analyzed for metals.

Annualized loading was calculated using rainfall data (proportionally adjusted for site elevation between the Silverton and Red Mountain weather stations), exposed area of waste dump or tailings site and loading based on 1:1 water bath test results. For comparison to adit flow loadings projects, the annualized loading was converted to an average daily loading.

Based on these assumptions and procedures, SGC estimates that the average daily loading for this site may be as much as 43.0 pounds of dissolved zinc per day. SGC is under no obligation to defend these estimates and they should only be used as an estimate. SGC does not represent that its mitigation project at this site will remove any specific percentage of metals loading from this site: the loading estimate contained herein does not form the basis of an enforceable permit obligation.

Description of Project

Sunnyside Gold Corporation (SGC) will provide sediment catchments below the tailings to minimize sediment transport to the river during excavation. The tailings would be removed from contact with flowing water and stormwater and placed in the Mined Land Reclamation permitted tailings pond on the property. The excavated area would then be revegetated. No additional reclamation work will be done on the permitted facility. The catchment traps will be removed, the site regraded, soil amendments added, seeded and mulched.

Work Plan

- 1) Build catchments.
- 2) Relocate tailings.
- 3) Remove catchments and regrade area.
- 4) Add soil amendments as needed, seed and mulch.

Analysis

Removal and consolidation of these tailings will remove the materials from exposure to groundwater seeps and severe the direct connection to the Animas River. This will prevent direct contact with flowing water and reduce the risk for impact to the Animas River and Cunningham Creek.

Monitoring

Due to the close proximity and high flow conditions which occur in the Animas River, no monitoring is contemplated for this project. In Lieu of monitoring at this location, the tributary mouth will be sampled on a rotating basis with the U. S. Bureau of Reclamation. Monitoring reports will be submitted the month after the analysis is received as well as with the quarterly reports and sent to both the Water Quality Control Division and the Division of Minerals and Geology.

Budget

SGC will fund this program unless the property owner chooses to contribute.

**Description of Land Use**

This remediation work plan is intended to use Best Management Practices on the site to conform with surrounding land use policies for:

- 1) Land stabilization, limited rangeland, and limited wildlife habitat to approximately resemble a mountain park ecosystem consistent with bordering undisturbed areas.
- 2) The conversion of facilities, usable for purposes other than mining, to alternate uses and preserve facilities of historic interest.

**Contingency Plans**

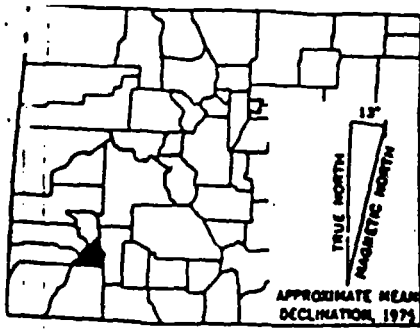
Construct catchments to prevent sediments from reaching the Animas River during excavation.

Should the owner not allow the tailings to be placed on the property: the tailings would then be relocated, mixed with high pH material for stabilization and placed in Tailings Pond #4 at the Mayflower Mill. Under SGC's MLR Permit (M-77-378), this material can be consolidated at Tailings Pond #4.

**6. Consistency with Other Plans**

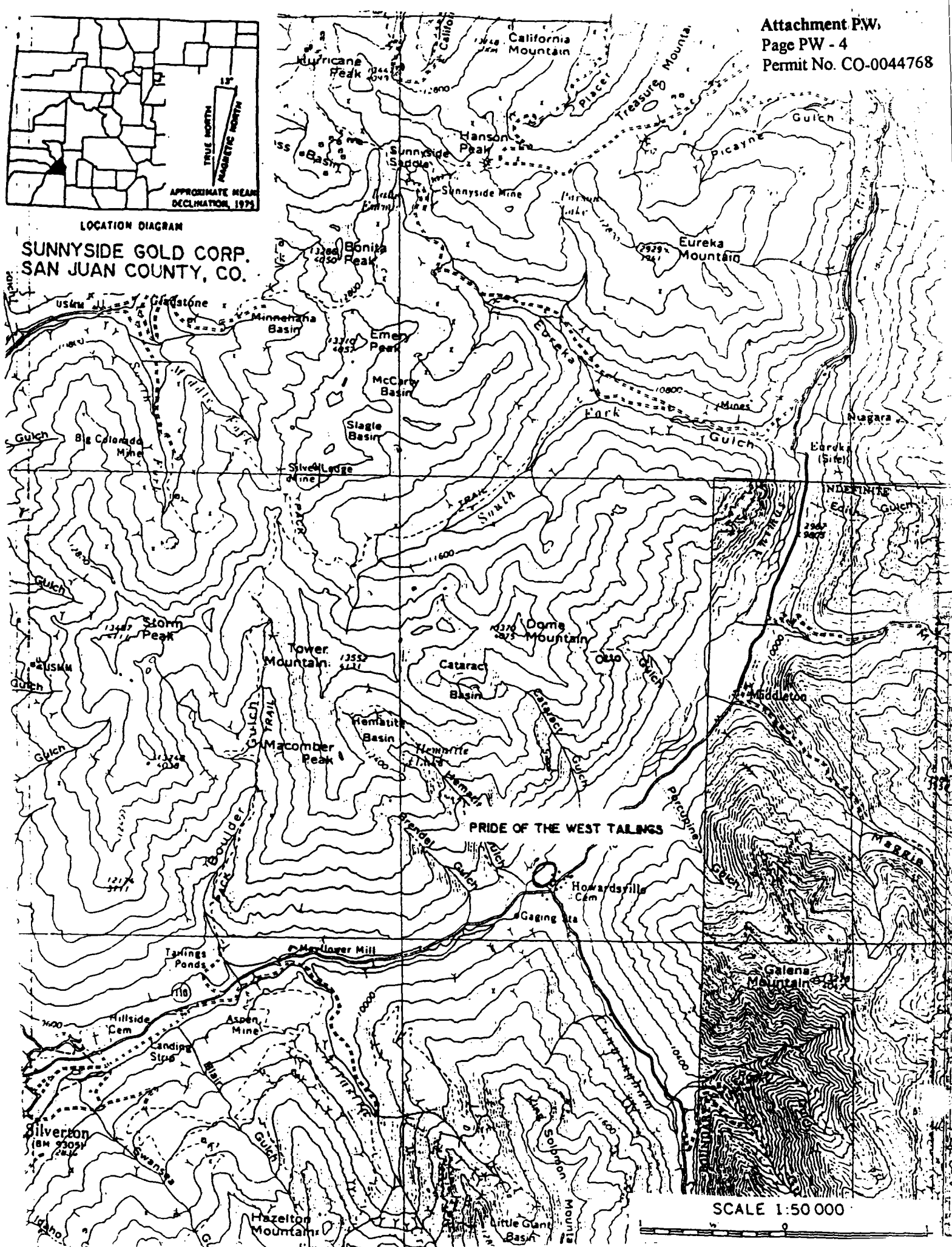
This remediation plan is consistent with what the Division of Minerals and Geology wants on this property. At this time the owner has not submitted any revisions to their permit for this remediation.

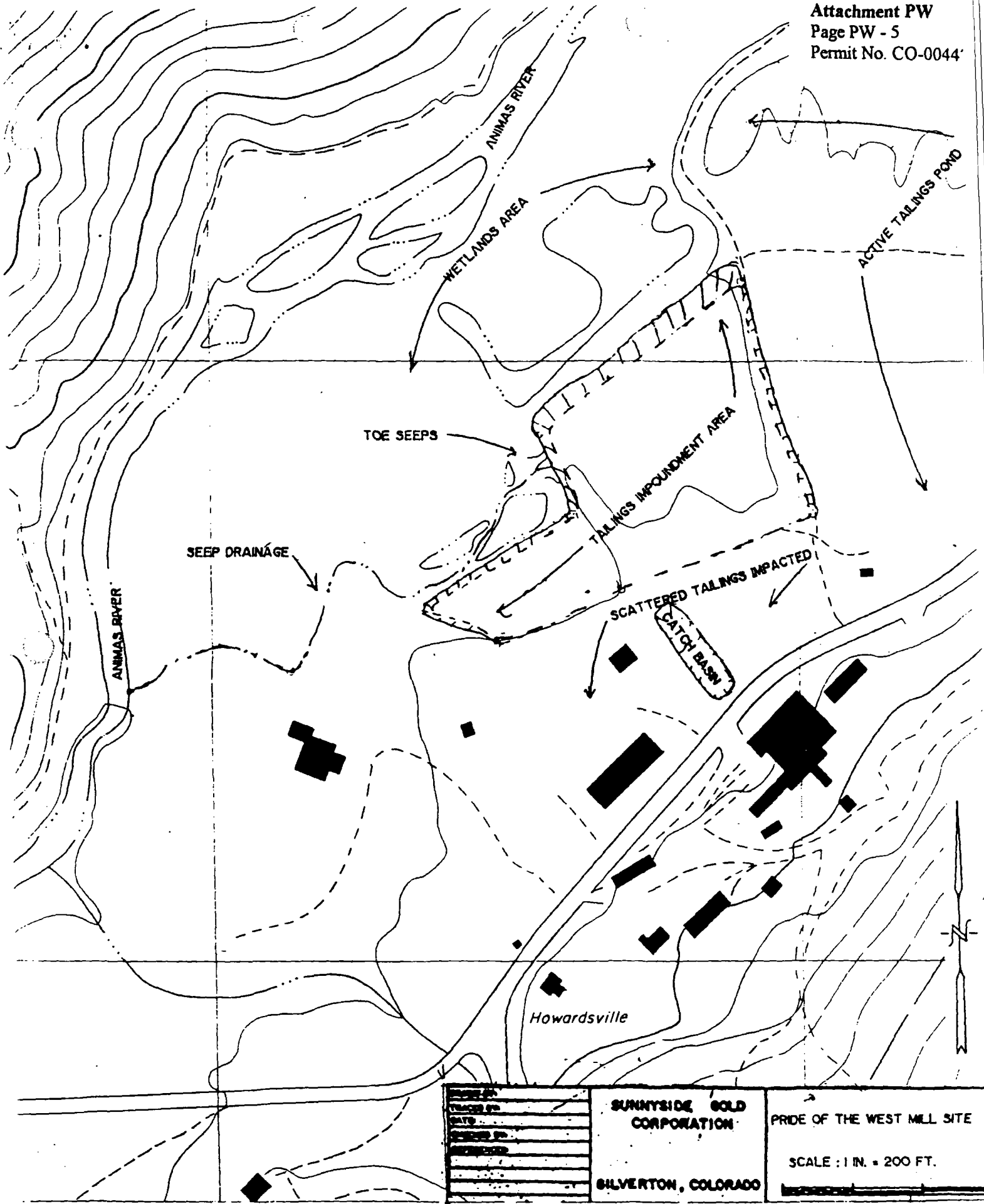
Should the material be trucked to SGC's Tailings Pond #4, it may require a Technical Revision to the site MLR permit by the owner of these tailings. Removal to SGC's Tailings Pond is consistent with the MLR Permit M-77-378 for that facility.



LOCATION DIAGRAM

SUNNYSIDE GOLD CORP.  
SAN JUAN COUNTY, CO.






**SUNNYSIDE GOLD CORPORATION**  
**SILVERTON, COLORADO**

**PRIDE OF THE WEST MILL SITE**  
 SCALE : 1 IN. = 200 FT.

**SITE CHARACTERIZATION DATA SUMMARY**

**SITE:** PRIDE

**SITE CHARACTERIZATION DATA SUMMARY**

**SITE:** PRIDE

**MEDIA:** SOILS

Analysis Method	Sample Description	Sample Date	DATA SOURCE	pH s.u.	Al ppm	Cd ppm	Cu ppm	Fe ppm	Mn ppm	Pb ppm	Zn ppm	COMMENTS
1:1 Water Bath	Tailings-Old Pond		SGC		29.6	8.21	11.7	11.3	191	3.6	610	
Modified 1312 TCLP	Tailings-Old Pond		SGC		3.2	0.529	1.3	1.24	15.6	4.2	46.5	
Total Metal Conc.	Tailings-Old Pond		SGC	3.7	11800	45	545	15900	1480	7600	10400	

# SITE CHARACTERIZATION DATA SUMMARY

SITE: PRIDE

MEDIA: WATER

Sample	Flt./Unflt.	Flow GPM	Sample Date	DATA SOURCE	pH s.u.	Al mg/l	Cd mg/l	Cu mg/l	Fe mg/l	Mn mg/l	Pb mg/l	Zn mg/l	Comments
A45	Unflt Flt	48380.64	34170 20-Jul-93	CDPHE CDPHE	6.99		0.06 0.00116	0.007	<		<	0.45	Animas above site
A46	Unflt Flt	57	08-Sep-91 08-Sep-91	CDPHE CDPHE	5.85	0.91 0.89	0.013 0.013	0.028 0.023	14 14	17 16	0.058 0.013	8.30 8.20	Drainage from old tailings
	Unflt Flt	480	25-Jun-92 25-Jun-92	CDPHE CDPHE	6.05		0.41 0.0082	0.021		5.4	0.02	3.10	
	Unflt Flt	15	15-Oct-92 15-Oct-92	CDPHE CDPHE	5.55		0.97 0.017	0.023			0.022	12.00	
	Unflt Flt	125	20-Jul-93 20-Jul-93	CDPHE CDPHE	5.1		0.0167 0.0174	0.061 0.051	20 18		0.09 0.012	10.00 10.00	
A46a	Unflt Flt	45656	20-Jul-93 20-Jul-93	CDPHE CDPHE	5.6	0.09 <	0.00135 0.00133	0.009 0.009	0.097 0.058		< <	0.45 0.44	Animas below site



# **SITE CHARACTERIZATION DATA SUMMARY**

**SITE: PRIDE**

**RAINFALL DATA:** Source Silverton Weather Station

YEAR	Rainfall		Snow Inch	Moisture as Snow Inch	Total Moisture Inch
	Inch				
June '91-May '92	9.55		134.75	11.58	21.1
June '92-May '93	9.82		260.5	12.89	22.71
June '93-May '94	7.42		130.5	10.03	17.45

**RAINFALL DATA:** Source Idarado Mining Company-Red Mountain Weather Station

YEAR	Rainfall		Snow Inch	Moisture as Snow Inch	Total Moisture Inch
	Inch				
June '91-May '92	8		444.5	35.56	43.56
June '92-May '93	8.8		545.5	49.89	58.69
June '93-May '94	7.1		330.5	26.12	33.22

Mine Remediation Plan

Sunnyside Mine Pool Mitigation

Remediating Party:

Sunnyside Gold Corporation  
P.O. Box 177  
Silverton, CO 81433

contact

William B. Goodhard  
Resident Manager

1. Description of Mining Activities

Physical Description of Conditions

Mining at the Sunnyside first started in the late 1880's and continued under various operators. Sunnyside Gold Corporation acquired the property in 1985 and operated until August of 1991 when closure of the mining operations initiated final reclamation. The Sunnyside Mine produced precious and base metal ores. Sunnyside Gold Corporation (SGC) is in the process of final reclamation at Sunnyside. As part of the final reclamation, SGC has proposed and the Colorado Mined Land Reclamation Board (MLRB) has approved (Nov 1993), the installation of hydraulic seals within the mine workings in order to return the hydrologic regime to an approximation of premining conditions. The seals are to be used to minimize flow through old workings while forcing a majority of the water around the mine workings. As the mine pool fills with oxygenated water, the mountain will be resaturated and historic flow paths will resume. After the oxygenated water reacts with sulfide mineralization, the mine pool will be devoid of oxygen and the pool will equilibrate at a near neutral pH.

General Description of the Mining Site

The Sunnyside Mine surface access is Northeast of Silverton, San Juan County, Colorado. The Terry Tunnel surface facility and Sunnyside Basin is accessed by taking State Highway 110 North out of Silverton to the historic Townsite of Eureka then up Eureka Gulch. See Attached Site Map

Identification of Lands

Underground workings of Sunnyside Mine located in San Juan County, Colorado. Workings lie under Sunnyside Basin with access tunnels from Eureka Creek, Terry Tunnel and the old townsite of Gladstone in Cement Creek, American Tunnel. See attached location map.

Latitude 37 degrees 54 minutes      Longitude 107 degrees 37 minutes

Identification of the Waters of the United States Potentially Affected

Headwaters of Eureka Creek and Cement Creek. Both flow into the Animas River at or upstream of Silverton, Colorado. See attached map.

2. Site Map

Attached

3. Stormwater Management Controls

At the Terry Tunnel the existing settling ponds will be used for catchments to prevent potential spillage at the injection site from entering the surface waters which flow past the Terry Tunnel. If the project is relocated to Sunnyside Basin then catchments will be installed in order to prevent potential spillage at the injection site from entering the surface waters which flow out of Sunnyside Basin. The surface area to be used at the Terry Tunnel is covered by the following permits: MLR Permit # M-77-378, CDPS Discharge Permit # CO-0036056 and CDPS Stormwater Permit # COR-040058.

#### Monitoring

There is no access to the mine pool except through the hydraulic seals located in the Terry Tunnel and American Tunnel. SGC will sample the quality of the pool through the American Tunnel seal annually, as described in Technical Revision #14 submitted to the Division of Minerals and Geology. The seep and spring sampling program described in SGC Technical Revision # 14 with the Division of Minerals and Geology will be continued as scheduled. Annual reports on the progress of this study are distributed to both the Division of Minerals and Geology and the Water Quality Control Division. Monitoring of seeps and springs will continue until the mine pool has reached equilibrium plus two years as defined in SGC MLR Permit Technical Revision # 14.

#### 4. Inspection and Record Keeping Procedures

##### Reporting

The SGC Manager or a member of the Technical Service Department will inspect the facility. Due to the seasonal access minimizing work time on this project, SGC will submit quarterly progress reports. Reporting for this project will include amount of alkaline material injected, water injected and effects on pool height. Once injection is completed, a final report will be submitted. Reports will be sent to both the Colorado Division of Minerals and Geology and the Water Quality Control Division.

#### 5. Mine Remediation Plan

##### Legal Right to Enter and Conduct Activities

All access necessary for this project is controlled by SGC and within The Mined Land Reclamation Permit area.

##### Photographs

Photographs documenting the condition of the project site before any remedial action has occurred will be submitted with the first regular report. Photographs of work in progress will be submitted with reporting as necessary to show remedial progress.

##### Description of Remedial Action

###### Remedial Goals and Objectives

- 1) Speed physical equilibrium of mine pool.
- 2) Speed chemical equilibrium of mine pool.
- 3) Reduce first flush impact, if any, from waters that may emanate from Sunnyside workings or from historic flow paths as they are reestablished when waters now entering the Sunnyside Mine begin once again to migrate through the area.
- 4) Maintain high pH water in pool in order to facilitate rapid drawdown, if necessary.

A basic pH of 9.0 to 10.0 within the mine pool is planned to counteract initial effects of mine pool water quality as it consumes its supply of oxygen and speeds the reactions necessary for chemical equilibrium.

Description of Project

The purpose of this project will address the following:

- 1) Force the mine pool to physical equilibrium at an accelerated rate.
- 2) Force the mine pool towards chemical equilibrium from a basic pH and avoid acid conditions.
- 3) Speed up the chemical equilibrium process by minimizing the initial oxygen dependent reaction with metal sulfides.
- 4) Provide alkaline solution to counteract the initial lowering of pH in the pool as oxygen is consumed.

The procedure for the project is to pump alkaline waters, using either caustic soda or hydrated lime to supply alkalinity, into and through the hydraulic seal at the Terry Tunnel. Should the pool elevation raise higher than expected then the project will be moved to Sunnyside Basin and the alkaline injection will be pumped through an old ventilation raise above the 2200 ore pass. The mixture will flow into the ore pass and mix with waters that flow towards the Terry Tunnel and be diverted to the 2200 ore pass. The 2200 ore pass is connected to six different levels of the mine and is the major conduit for water to spread into the workings. See attached drawing.

The schedule for pumping of alkaline waters is limited due to avalanche conditions in the winter at the Terry Tunnel (11,500' elevation) and the short summer runoff period in Sunnyside Basin, typically July and August, and because of limited access to the 12,000' plus site (elevation). At The Terry Tunnel the extended injection time will typically be from June until November. The pumping rate will be set between 600 and 1200 gallons per minute due to stream flows, will allow for 129 million plus gallons to be added per season. At Sunnyside Basin during high flow conditions approximately 12 million plus gallons of water can be added to the pool per season.

Pumping could continue until physical equilibrium is established. Annual evaluation will determine if continuation after the initial year is warranted. It will take an estimated 195 million gallons to reach expected equilibrium. Based on water treatment experience, to raise the pH from 6.5 to 9.5 will require the addition of at least 200 tons of lime for quality of water at expected equilibrium. SGC would add additional lime or caustic soda to counteract acidity generated by the pool consuming its supply of oxygen.

The project will target a pH of approximately 9.0 to 10.0 in the pool. The injection pH will be periodically adjusted based on bench scale testing to achieve a target injection pH level of 12.0.

Work Plan

- 1) Once the Terry Tunnel is accessible a pipe line will be strung from McCarty Creek and combined with an injection pipe to the Terry Tunnel hydraulic seal at which a one way valve will be installed. The line will be used to pump water and pH adjusting fluids through the Terry Tunnel hydraulic seal and into the orepass.
- 2) Pumping will be ongoing as long as there is water available and access to the Terry Tunnel is safe. The injection would be ongoing until it appears that the mine pool is reaching physical equilibrium.
- 3) Once the mine pool reaches equilibrium the piping will be disassembled.
- 4) Reclamation of the area is addressed as part of SGC's MLR Permit (M-77-378).

Analysis

Pumping of high pH waters with buffering capability will enhance the following aspects of the hydraulic seal project.

- 1) Will speed the process of achieving physical equilibrium and allow the physical system to be evaluated over a shorter time period than would occur naturally.

**Attachment SP**

**Page SP - 4**

**Permit No. CO-0044768**

- 2) Will speed the process of achieving chemical equilibrium by offsetting the production of acidity while pool is deoxygenating.
- 3) Any underground waters that move through the mine and eventually report to the surface as seeps and springs will be of higher pH and have alkalinity to neutralize acid salts that may be present in the mine or historic geologic faults.
- 4) Should future drawdown of the mine pool become necessary, drawdown could be accomplished more rapidly because pool water would be of higher pH and better quality.

As the entire system moves to equilibrium, the addition of high pH waters will force physical and chemical equilibrium faster and result in lower initial concentrations of dissolved heavy metals in the pool.

**Budget**

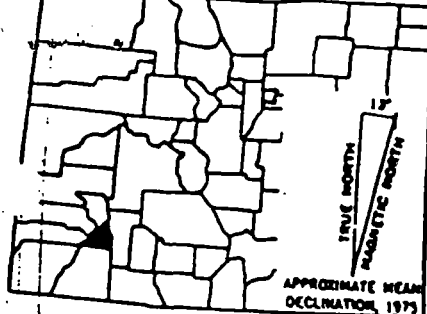
SGC will fund this program

**Attachments Available From The WOCD Upon Request**

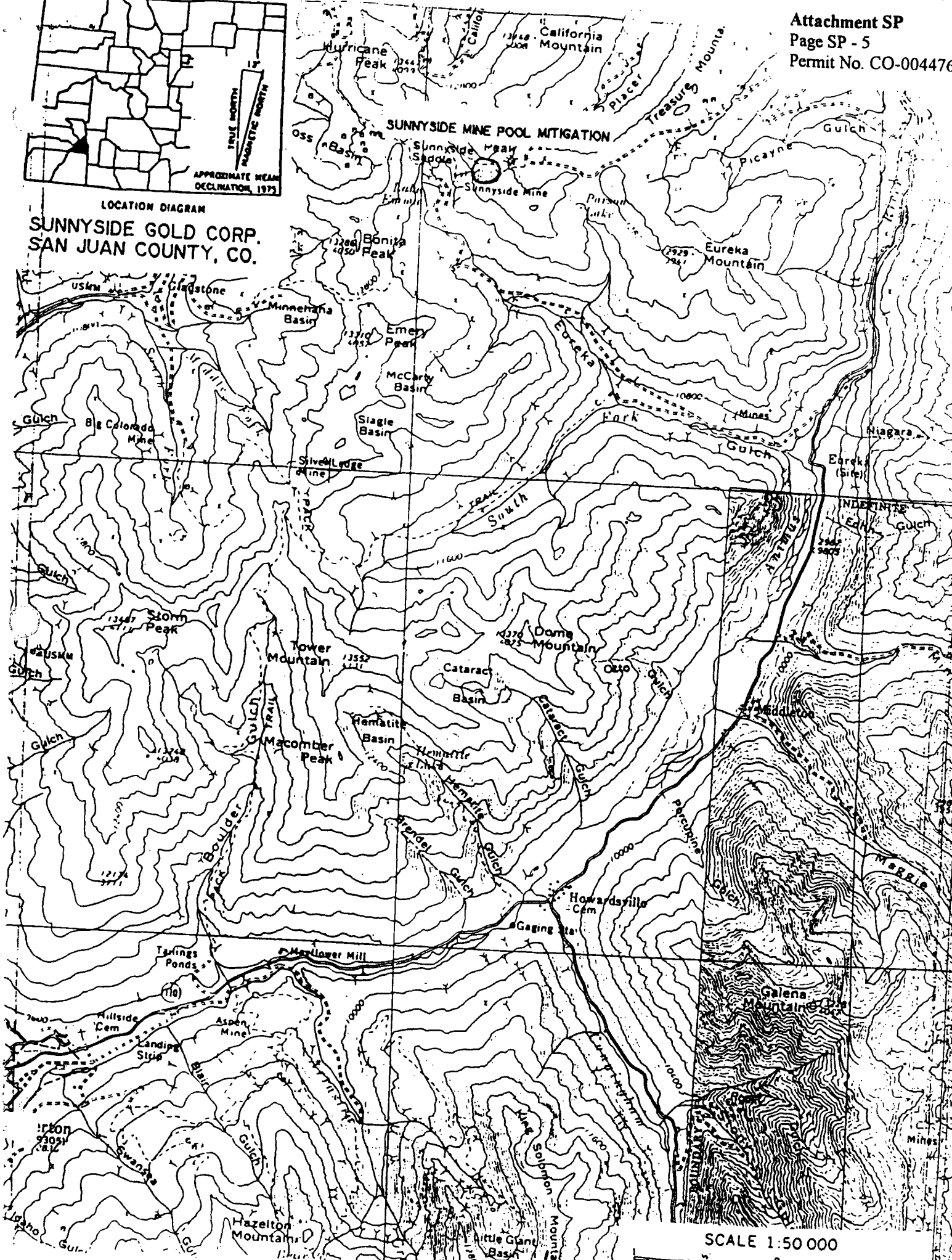
**Report on Injection**

**6. Consistency with Other Plans**

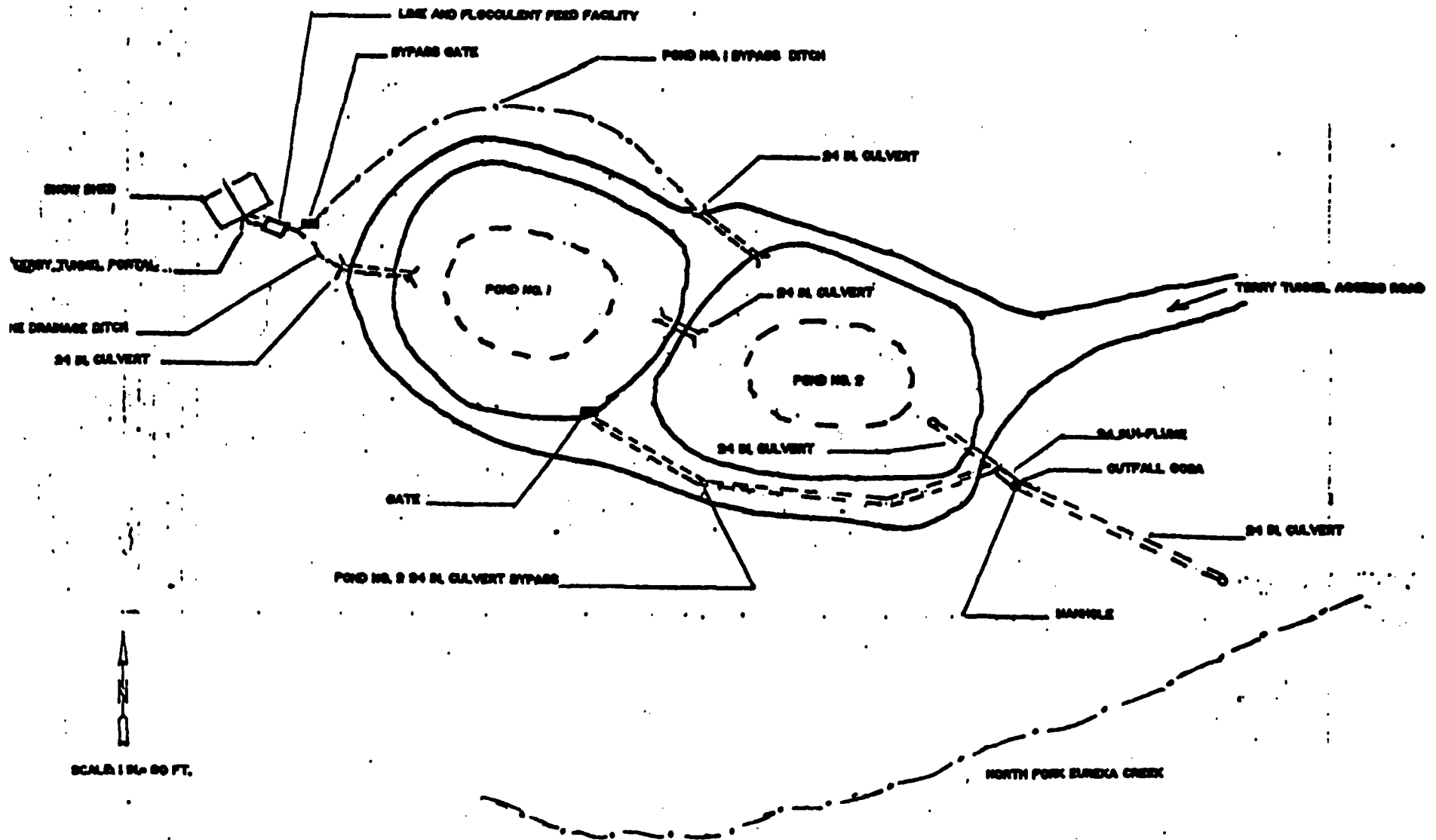
This mine remediation plan will use the surface facility at the Terry Tunnel which is covered by the following permits: MLR Permit M-77-378, CDPS Discharge Permit # CO - 0036056 and CDPS Stormwater Permit # COR-040058.



**SUNNYSIDE GOLD CORP.  
SAN JUAN COUNTY, CO.**



TERRY TUNNEL PORT  
SILVERTON OPERATIONS  
SUNNYSIDE MINE



**APPENDIX D**  
**CDPS RENEWAL #CO-0027529**  
**American Tunnel**



# COLORADO DISCHARGE PERMIT SYSTEM (CDPS)

## SUMMARY OF RATIONALE

### SUNNYSIDE GOLD CORPORATION AMERICAN TUNNEL CDPS PERMIT NUMBER CO-0027529, SAN JUAN COUNTY

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IV. FACILITY DESCRIPTION .....	3
V. PERFORMANCE HISTORY .....	3
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VII. CHANGES MADE AFTER PUBLIC NOTICE .....	7

**I. TYPE OF PERMIT** *Fourth Renewal*

**II. FACILITY INFORMATION**

A. Facility Type: *Hardrock Mining - Mine Dewatering*  
Fee Category: *Category 03, Subcategory 3*  
Category Flow Range: *1.0 MGD or greater*  
Annual Fee: *\$1,519*

B. SIC Code: *1041*

C. Legal Contacts: *William Goodhard, Manager  
Sunnyside Gold Corporation  
P.O. Box 177  
Silverton, CO 81433  
(303) 387-5533*

D. Facility Contact: *Larry Perino, Superintendent, Technical Services  
Sunnyside Gold Corporation  
P.O. Box 177  
Silverton, CO 81433  
(303) 387-5533*

E. Facility Location: *T42N, R7W, NE1/4 S21, approx. 200 ft. south of the endpost of the west fork of  
Colorado Hwy 110 starting at Silverton, CO.*

F. Discharge Point: *004A, the outfall from the fourth treatment pond, which consists of flow from the  
American Tunnel, and possibly a portion of the receiving stream which may be  
diverted into the treatment plant, following treatment and prior to discharge to  
Cement Creek.*

*004X, which is physically the same as outfall as 004A, but which will be used to  
report chronic Whole Effluent Toxicity testing results. This discharge point will only  
be used until treatment of Cement Creek (explained later in rationale) is begun.  
After that time, the permittee may report "no discharge" on the appropriate DMR,  
and request to have this outfall inactivated.*

### III. RECEIVING STREAM

#### A. Identification, Classification and Standards

1. Identification: Discharges to Cement Creek, Segment 7 of the Animas and Florida Sub-basin of the San Juan River Basin.
2. Classification: This stream segment is designated as Use Protected and is classified for the following uses: Recreation, Class 2; Agriculture
3. Numeric Standards: The standards which have been assigned in accordance with the above classifications can be found in 3.4.0., Classifications and Numeric Standards for the San Juan River Basin (5 CCR 1002-8), which became effective March 30, 1995. The organic standards which apply to this receiving stream are listed in 3.1.0 Basic Standards and Methodologies for Surface Water (5 CCR 1002-8), effective March 2, 1995. The following numeric standards which have been assigned in accordance with the above classifications will be used to develop effluent limitations.

#### Physical and Biological Standards

pH = 3.7 - 9.0 s.u.

Fecal Coliforms = 200/100 ml

#### Metals

The Classifications and Numeric Standards for the San Juan River Basin contain the following narrative standards for metals: "Effective until March 2, 1998, all metals standards have been set equal to existing ambient quality. Effective as of March 2, 1998, as a result of further Water Quality Control Commission actions, metals standards will be equal to the concentrations of dissolved aluminum, cadmium, copper, iron, lead, manganese and zinc that are directed toward maintaining and achieving water quality standards in segments 3a, 4a, 4b and 9b of the Animas Basin."

#### B. Receiving Water Data

1. Quality - The Division, in coordination with other entities, has extensively sampled the upper Animas Basin, including Cement Creek. In general, the results of that sampling indicate that concentrations of several metals exceed certain aquatic life criteria. A more detailed discussion is presented in 3.4.0., Classifications and Numeric Standards for the San Juan River Basin.
2. Quantity, Acute and Chronic Low Flows - There are no effluent limitations in this permit that are based upon mass-balance calculations, which would require the estimation of upstream low-flows for the receiving stream.
3. Impacts on Downstream Water Supplies or Other Receiving Waters: Provided the terms and conditions of this permit are complied with, no adverse impacts on downstream segments should occur.

#### IV. FACILITY DESCRIPTION

##### A. Industry Description

1. **Type of Industry** - The industry which has resulted in creation of the discharge is gold mining. No active mining is currently occurring or planned. The American Tunnel is in the process of being plugged, with the intention of reducing and ultimately eliminating flows.
2. **Sources to the Treatment Plant** - The discharge being treated emanates from the portal of the American Tunnel, which has historically been used to access extensive underground mine workings. The permittee has been negotiating arrangements with the State related to the plugging of this tunnel, resulting in a consent decree. Until the plugging is complete, the permittee will continue to treat any American Tunnel discharge. For an interim period of time, the permittee may also be treating a portion of the flow of the receiving stream (Cement Creek or its tributaries), which will be diverted into the treatment plant.
3. **Chemicals Used** - The chemicals used at the plant include quicklime, which is used for pH adjustment, and flocculent that is used to aid settling. The latest information available to the Division indicates that the specific flocculent being used is Nalco 7877.

##### B. Wastewater Treatment Description

The treatment system consists of pH adjustment with quicklime, flocculent addition, and then settling in a series of four ponds. Pursuant to the authority of Article 9, Title 25, Regulations for the Certification of Water Treatment Plant and Wastewater Treatment Plant Operators, this facility may require a certified operator. The Operator Certification Board is within the Colorado Department of Public Health and Environment and should be contacted relative to specific requirements.

#### V. PERFORMANCE HISTORY

##### A. Monitoring Data

1. Table V-1 summarizes the effluent data reported on the monthly Discharge Monitoring Reports (DMR's) for the American Tunnel facility from 11/93 to 10/95.

Table V-1 - Self-Monitoring Results

Parameter	# Samples or Reporting Periods	Reported Concentrations						Previous Permit Limit
		Avg	Min	Max	Std D	50th %	85th %	
Flow, MGD	24	2.4	2.0	4.8	0.51	2.3	2.4	n.a.
pH, su	24		9.2	10.0				7.0-10.0
TSS, mg/l	24	10.6	5.0	19.0	3.3	11	14	20
Cadmium, mg/l	24	0.0012	0.000	0.006	0.0019	0.000	0.003	0.050
Copper, mg/l	24	0.010	0.000	0.038	0.010	0.008	0.015	0.150
Lead, mg/l	24	0.010	0.000	0.134	0.030	0.002	0.005	0.300
Zinc, mg/l	24	0.250	0.100	0.470	0.100	0.250	0.360	0.750
WET, Chronic, % Effect								
Ceriodaphnia	7		71.3	100		100	100	
Pimephales	7		25	100		100	100	

## VI. TERMS AND CONDITIONS OF PERMIT

### A. Determination of Effluent Limitations

1. *Effluent Limitations - The following limits will apply and are discussed in Sections VI-A.2 and VI-A.3.*

**Table VI-1 - Effluent Limits**

Effluent Parameter	Discharge Limitations Maximum Concentrations			Rationale
	30-Day Avg.	7-Day Avg.	Daily Max.	
<u>Limits for Point 004A</u>				
Flow, MGD (min-max)	N/A	N/A	Report	Discharge Assessment
pH, su (min-max)	N/A	N/A	7.0 - 10.0	Best Professional Judgment
Oil and Grease, mg/l	N/A	N/A	10	State Effluent Regulations
TSS, mg/l	20	30	N/A	Best Professional Judgment
Cadmium, Total, mg/l	0.05	N/A	0.10	Best Professional Judgment
Copper, Total, mg/l	0.15	N/A	0.30	Best Professional Judgment
Lead, Total, mg/l	0.30	N/A	0.60	Best Professional Judgment
Zinc, Total, mg/l	0.75	N/A	1.5	Best Professional Judgment
TDS, mg/l	N/A	N/A	Report	Salinity Regulations
<u>Limits for Point 004X - Only Applicable Until Treatment of Cement Creek Has Begun</u>				
Whole Effluent Toxicity, Chronic	N/A	N/A	No Significant Difference	Discharge Permit Regulations

### 3. Discussion of Effluent Limitations

- a. **Regulations for Effluent Limitations:** *The Regulations for Effluent Limitations (10.1.0), apply to the conventional pollutants. For this facility the limitation for oil and grease is based on this regulation.*
- b. **Applicable Federal Effluent Guidelines and Standards:** *Since no active mining is occurring, no federal guidelines apply to this type of facility.*
- c. **Flow Limitation:** *The permittee has entered into a consent agreement with the State, which specifies how the combination of American Tunnel flow and the flows Cement Creek and its tributaries will be routed through the treatment plant. The flow routing procedure may be relatively complicated and specification of a single flow limit may not be possible. Therefore, only flow reporting, without a limit, will be required.*
- d. **Limits Based Upon Best Professional Judgment:** *The previous permit contained effluent limits for TSS and metals that were based upon the federal effluent regulations (BAT). And, the pH limit was based upon a BPJ adjustment to the State Effluent Regulation limit, which resulted from the Division's consideration of impacts to the receiving stream.*

*No active mining is currently occurring. Therefore federal BAT limitations are not directly applicable. However, as a result of the consent agreement between the permittee and the state, the permittee will operate the treatment plant in the same manner as that which was done during the term of the previous permit, and effluent concentrations will likely be similar to those discharged in the past. Therefore, the same limits for TSS, metals and pH contained in the previous permit will be implemented in this renewal permit.*

- e. Antidegradation - Since the receiving water is Use Protected, an antidegradation review is not required pursuant to section 3.1.8(1)(b) of The Basic Standards and Methodologies for Surface Water.
  - f. Salinity Regulations - In compliance with the "Regulations for Implementation of the Colorado Salinity Standards Through the CDPS Permit Program", the permittee shall monitor for total dissolved solids on a quarterly basis. Samples shall be taken at the effluent discharge point(s).
  - g. Net Limits - Before the last renewal of this permit, effluent limitations were based upon net limits, allowing credits for contaminants in certain measured ground water seeps into the American Tunnel below the SGC property line. In the last renewal, net limitations were removed because the Division concluded that the ground water inflow was not being returned to the same body of water from which it came. The permittee continues to feel that net limitations are appropriate under the regulations, particularly if, in the future, waters in the American Tunnel are returned to ground water. No intake credits have been allowed in the effluent limitations for this permit renewal.
4. Whole Effluent Toxicity (WET) Testing

In compliance with the previous permit, the permittee has been performing chronic WET testing. Results over the last two years have all passed the chronic WET limitations, with the dilution at which a significant difference in toxicity between the dilution and the control being greater than 100% in most cases. This indicates that the likelihood of ever having a chronic WET failure is very small.

As a result of the plugging of the American Tunnel, it is likely that the Instream Waste Concentration (IWC) would be less than what was used in the previous permit, even further reducing the possibility of a WET failure.

Another factor to consider is that, as a result of the consent agreement between the permittee and the State, the permittee will treat Cement Creek streamflow which historically has had higher pollutant concentrations than the treated effluent. When these factors are processed in a mass-balance equation, the result is a reduced pollutant loading and concentration in the Animas River, which is the first downstream waterbody classified for aquatic life use. The Division expects that an overall result of the consent agreement will be the maintenance of both the numeric and narrative standards for the Animas River.

As a result of the above considerations, the Division has determined that neither WET limitations nor WET monitoring for this permit are required after treatment of Cement Creek is begun. Until that time, chronic WET testing and limitations will be included in the permit, based upon the same IWC that was used in the previous permit, which was 10.3%.

The results of the testing are to be reported on Division approved forms. The permittee will be required to conduct a statistical derivation on the data, looking for any statistically significant difference in toxicity between the control and the effluent concentrations. This set of calculations will look at the full range of toxicity (lethality, growth and reproduction). If a level of chronic toxicity occurs, such that there is a statistically significant difference in the lethality (at the 95% confidence level) between the control and any effluent concentration less than or equal to the Instream Waste Concentration (IWC), the permittee will be required to follow the automatic compliance schedule identified in Part I.B. of the permit, if the observed toxicity is due to organism lethality. Only exceedance of the limitation specified in Part I.A. will trigger the requirement for conducting the automatic compliance schedule identified in Part I.B. of the permit. If the toxicity is due to differences in the growth of the fathead minnows or the reproduction of the Ceriodaphnia, no immediate action on the part of the permittee will be required. However, this incident, along with other WET data, will be evaluated by the Division and may form the basis for reopening the permit and including additional WET limits or other requirements.

The permittee should read the WET testing sections of Part I.A. and I.B. of the permit carefully. The permit outlines the test requirements and the required follow-up actions the permittee must take to resolve a toxicity incident. The permittee should read, along with the documents listed in Part I.B of the permit, the Colorado Water Quality Control Division Biomonitoring Guidance Document, dated July 1, 1993. This document outlines the criteria used by the Division in such areas as granting relief from WET testing, modifying test methods and changing test species. The permittee should be aware that some of the conditions outlined above may be subject to change if the facility experiences a change in discharge, as outlined in Part II.A.1 of the permit. Such changes shall be reported to the Division immediately.

5. Stormwater: This facility is covered by a separate stormwater permit.

6. Economic Reasonableness Evaluation:

Section 25-8-503(8) of the revised (June 1985) Colorado Water Quality Control Act required the Division to "determine whether or not any or all of the water quality standard based effluent limitations are reasonably related to the economic, environmental, public health and energy impacts to the public and affected persons, and are in furtherance of the policies set forth in sections 25-8-192 and 25-8-104."

The Regulations for the State Discharge Permit System, 6.1.0, further define this requirement under 6.12.0 and state: "Where economic, environmental, public health and energy impacts to the public and affected persons have been considered in the classifications and standards setting process, permits written to meet the standards may be presumed to have taken into consideration economic factors unless:

- a) A new permit is issued where the discharge was not in existence at the time of the classification and standards rulemaking, or
- b) In the case of a continuing discharge, additional information or factors have emerged that were not anticipated or considered at the time of the classification and standards rulemaking."

The evaluation for this permit shows that the Water Quality Control Commission, during their proceedings to adopt the Classification and Numeric Standards for the San Juan River Basin, considered economic reasonableness.

Furthermore, this is not a new discharger and no new information has been presented regarding the classifications and standards. Therefore, the water quality standard-based effluent limitations of this permit are determined to be reasonably related to the economic, environmental, public health and energy impacts to the public and affected persons and are in furtherance of the policies set forth in Sections 15-8-102 and 104.

#### B. Monitoring

1. Effluent Monitoring - Effluent monitoring will be required as shown in Table VI-3. Refer to the permit for locations of monitoring points.

Table VI-3 -Effluent Monitoring Requirements

<u>Effluent Parameter</u>	<u>Monitoring Frequency</u>	<u>Sample Type</u>
<u>For Point 004X - Applicable Only Until Treatment of Cement Creek Begins</u>		
Whole Effluent Toxicity, Chronic	Quarterly	3 Composites

**Table VI-3 -Effluent Monitoring Requirements - cont'd**

<b>Effluent Parameter</b>	<b>Monitoring Frequency</b>	<b>Sample Type</b>
<b>For Point 004A</b>		
Flow, MGD	Weekly	Instantaneous
pH, su	Weekly	In-Situ
Oil and Grease, mg/l	Weekly	Visual
TSS, mg/l	Weekly	Grab
Cadmium, Total, mg/l	Weekly	Grab
Copper, Total, mg/l	Weekly	Grab
Lead, Total, mg/l	Weekly	Grab
Zinc, Total, mg/l	Weekly	Grab
TDS, mg/l	Quarterly	Grab

For every outfall with oil and grease monitoring, in the event an oil sheen or floating oil is observed, a grab sample shall be collected, analyzed, and reported on the appropriate DMR. In addition, corrective action shall be taken immediately to mitigate the discharge of oil and grease. A description of the corrective action taken should be included with the DMR.

#### C. Reporting

1. **Discharge Monitoring Report:** Sunnyside Gold Corporation must submit a Discharge Monitoring Report (DMR) on a monthly basis to the Division. This report should contain the required summarization of the test results for parameters shown in Table VI-3 and Part I.B.1 of the permit. See the permit, for details on such submission.
2. **Special Reports** - Special reports are required in the event of a spill, bypass, or other noncompliance. Please refer to Part I, Section D.4. of the permit for reporting requirements.

#### D. Additional Terms and Conditions

1. **Signatory Requirements** - Signatory requirements for reports and submittals are discussed in Part I, Section D.1. of the permit.
2. **Materials Containment Plan:** On February, 1988, the permittee submitted an engineered spill plan. An update to the plan is required to be filed within 90 days of the permit effective date, detailing all changes which have occurred since the original submittal. If no changes have occurred, a letter to this effect is required. For specific requirements, refer to Part I.E. of the permit.

#### E. Waste Minimization/Pollution Prevention

Waste minimization and pollution prevention are two terms that are becoming increasingly more common in industry today. Waste minimization includes reducing the amount of waste at the source through changes in industrial processes, and reuse and recycling of wastes for the original or some other purpose such as materials recovery or energy production. Pollution prevention goes hand-in-hand with waste minimization. If the waste is eliminated at the front of the line, it will not have to be treated at the end of the line. The direct benefits to the industry are often significant - both in terms of increased profit and in public relations. This program can affect all areas of process and waste control with which your industry deals. Elimination or reduction of a wastewater pollutant can also result in a reduction of an air pollutant or a reduction in the amount of hazardous materials that you have to handle and/or dispose of. This discharge permit does not specifically dictate waste minimization conditions at this time. We strongly encourage the permittee to develop a waste minimization plan. Several industries have already developed plans and found that implementation resulted in substantial savings. Both the Colorado Department of Public Health and the Environment and EPA have information and resources available to help you explore this topic.

F. *Permit Termination*

*The permittee will be released from further permit responsibilities in accordance with conditions specified in the consent agreement.*

VII. *CHANGES MADE AFTER PUBLIC NOTICE*

*Three Sunnyside Gold Corporation permits were sent to public notice - CO-0027529, which is for the American Tunnel discharge, CO-0036056, which is for the Terry Tunnel discharge, and CO-0044768, which is for mine remediation projects in the Upper Animas basin. In addition, a related draft Consent Decree that has been negotiated between the Division and the mining company was in the same public notice.*

*Responses to the public notice were received from private citizens, a committee of members of the Animas River Stakeholders group, several environmental and mining industry oriented groups, several governmental agencies, and the Sunnyside Gold Corporation itself.*

*Most of the comments received were related to the consent decree, which is being dealt with separately from the discharge permits.*

*With respect to this discharge permit, the following issues were raised:*

- 1) Comment: The CDPS permits must function as stand alone documents, regardless of the existence of the consent decree.*

*Response: The permits were reviewed to find any terms or conditions that through reference were dependent upon the contents of the consent decree. Where such permit conditions were found, they were revised to more explicitly describe the intended permit requirements. However, there is one exception to this that should be noted. Each draft permit included a termination clause which referred directly back to the consent decree. While this clause was modified to additionally require compliance with State permit regulations, it was determined that it would not be practical to include the consent decree's conditions related to permit termination within the permits themselves. Also, the termination clauses do not affect the enforceability of the permits. For these reasons, the termination clauses' references to the consent decree were retained.*

- 2) Comment: For the American Tunnel permit, until it can be shown that there has been a substantial reduction in the toxicity of Cement Creek downstream of the tunnel discharge over present conditions, Whole Effluent Toxicity (WET) monitoring and limits should apply to the Discharge.*

*Response: Cement Creek is not classified for aquatic life use. Therefore, it would be inappropriate to perform instream WET testing for Cement Creek. The first downstream segment classified for aquatic life is the Animas River. While the Division is concerned about controlling the toxic effects of the American Tunnel upon the Animas River, it would also be inappropriate to perform any instream WET testing there, due to the large number of other pollutant sources that may also be contributing toxicity.*

*Instead, the Division has relied upon calculations involving flows and pollutant concentrations to show that treatment of Cement Creek will reduce significant pollutant concentrations at the mouth of Cement Creek. Since toxicity is most often demonstrated, and may be defined by the presence of a concentration vs toxicity relationship, where an increase in concentration results in an increase in toxicity, it can be argued that a reduction in pollutant concentrations at the mouth of Cement Creek is likely to also produce a reduction in toxicity.*

*However, in order to maintain consistency with other permits, the permit will require continued WET monitoring and limits until the treatment of Cement Creek begins. This will be accomplished through the addition of a separate outfall for WET testing.*

*Rich Horstmann  
May 2, 1996*



Permit No.: CO-0027529

County: San Juan

## **AUTHORIZATION TO DISCHARGE UNDER THE COLORADO DISCHARGE PERMIT SYSTEM**

In compliance with the provisions of the Colorado Water Quality Control Act, (25-8-101 et seq., CRS, 1973 as amended) and the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq.; the "Act") the

### **SUNNYSIDE GOLD CORPORATION**


is authorized to discharge from the American Tunnel treatment facility located in the T42N, R7W, NE1/4 S21, approx. 200 ft. south of the endpost of the west fork of Colorado Hwy 110 starting at Silverton, CO. to Cement Creek in accordance with effluent limitations, monitoring requirements and other conditions set forth in Part I and II hereof. All discharges authorized herein shall be consistent with the terms and conditions of this permit.

The applicant may demand an adjudicatory hearing within thirty (30) days of the issuance of the final permit determination, per the Regulations for the State Discharge Permit System, 6.8.0 (1). Should the applicant choose to contest any of the effluent limitations, monitoring requirements or other conditions contained herein, the applicant must comply with Section 24-4-104 CRS and the Regulations for the State Discharge Permit System. Failure to contest any such effluent limitation, monitoring requirement, or other condition, constitutes consent to the condition by the Applicant.

This permit and the authorization to discharge shall expire at midnight, May 31, 2001.

Issued and Signed this 6<sup>th</sup> day of May 1995

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

  
J. David Holm, Director  
Water Quality Control Division

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## PART I

### A. DEFINITION OF EFFLUENT LIMITATIONS

#### 1. Effluent Limitations

Beginning no later than the effective date of this permit and lasting through May 31, 2001, the permittee is authorized to discharge from outfall 004A, the outfall from the fourth treatment pond to Cement Creek, and 004X, which is physically the same point, but which will be used for chronic WET testing purposes until treatment of Cement Creek begins. After treatment of Cement Creek begins, the permittee may report "no discharge" on the DMR for this point, and then request inactivation of the discharge point.

In accordance with the Water Quality Control Commission Regulations for Effluent Limitations, Section 10.1.3, and Regulations for State Discharge Permit System, Section 6.9.2, 5 C.C.R. 1002-2, the permitted discharge shall not contain effluent parameter concentrations which exceed the following limitations specified below or exceed the specified flow limitation.

Effluent Parameter	Discharge Limitations - Maximum Concentrations		
	30-Day Avg.	7-Day Avg.	Daily Max.
<u>Limits for Point 004A</u>			
Flow, MGD (min-max)	Report	N/A	Report
pH, su (min-max)	N/A	N/A	7.0 - 10.0
Oil and Grease, mg/l	N/A	N/A	10
TSS, mg/l	20	30	N/A
Cadmium, Total, mg/l	0.05	N/A	0.10
Copper, Total, mg/l	0.15	N/A	0.30
Lead, Total, mg/l	0.30	N/A	0.60
Zinc, Total, mg/l	0.75	N/A	1.5
<u>Limits for Point 004X</u>			
Whole Effluent Toxicity, Chronic Lethality	N/A	N/A	See Part I.A.2.

There shall be no discharge of floating solids.

#### 2. Whole Effluent Toxicity - Chronic Lethality Limitation

Beginning upon the effective date of this permit, there shall be no statistically significant difference in lethality (at the 95% confidence level) between the control and any effluent concentration less than or equal to 10.3% effluent. Such limitation shall apply as a daily maximum.

3. **Whole Effluent Toxicity Testing Requirements - Chronic WET Testing-Outfall(s): 004X**

(a) **Testing and Reporting Requirements**

**Tests shall be done at the frequency listed in Part I.B.1.** Test results shall be reported along with the Discharge Monitoring Report (DMR) submitted for the reporting period during which the sample was taken. (i.e., WET testing results for the first calendar quarter ending March 31 shall be reported with the DMR due April 28.) The results shall be submitted on the Chronic Toxicity Test report form, available from the Division. Copies of these reports are to be submitted to both the Division and EPA along with the DMR.

The permittee shall conduct each chronic WET test in general accordance with methods described Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, EPA/600/4-89/001 or the most current edition, except as modified by the most current Division guidance document entitled Guidelines for Conducting Whole Effluent Toxicity Tests. The permittee shall conduct such tests using *Ceriodaphnia dubia* and fathead minnows.

(b) **Failure of Test and Division Notification (Beginning on Effective Date of Limitation)**

Beginning on the effective date of the limitation, a chronic WET test is failed whenever there is a statistically significant difference in lethality between the control and any effluent concentration less than or equal to the instream waste concentration ("IWC"). The IWC for this permit has been determined to be 10.3%. The permittee must provide written notification of the failure of a WET test to the Division, along with a statement as to whether a Preliminary Toxicity Investigation ("PTI")/Toxicity Identification Evaluation ("TIE") or accelerated testing is being performed. **Notification must be received by the Division within 21 calendar days of the demonstration of chronic WET in the routine required test.** "Demonstration" for the purposes of Parts I.A.4(b),(c),(d), (e) and (g) means no later than the last day of the laboratory test.

(c) **Automatic Compliance Schedule Upon Failure of Test**

If a routine chronic WET test is failed, the following automatic compliance schedule shall apply. As part of this the permittee shall either:

- (i) proceed to conduct the PTI/TIE investigation as described in Part I.A.4.e, or
- (ii) conduct accelerated testing using the single species found to be more sensitive.

**If accelerated testing is being performed, the permittee shall provide written notification of the results within 14 calendar days of completion of the "Pattern of Toxicity"/"No Toxicity" demonstration.** Testing will be at least once every two weeks for up to five tests until; 1) two consecutive tests fail or three of five tests fail, in which case a pattern of toxicity has been demonstrated or 2) two consecutive tests pass or three of five tests pass, in which case no pattern of toxicity has been found. If no pattern of toxicity is found the toxicity episode is considered to be ended and routine testing is to resume. If a pattern of toxicity is found, a PTI/TIE investigation is to be performed. If a pattern of toxicity is not demonstrated but a significant level of erratic toxicity is found, the Division may require an increased frequency of routine monitoring or some other modified approach.

(e) **PTI/TIE**

**The results of the PTI/TIE investigation are to be received by the Division within 120 days of the demonstration of chronic WET in the routine test, as defined above, or if accelerated testing is performed, the date the pattern of toxicity is demonstrated. A status report is to be provided to the Division at the 30, 60 and 90 day points of the PTI/TIE investigation.** The Division may extend the time frame for investigation where reasonable justification exists. A request for an extension must be made in writing and received prior to the 120 day deadline. Such request must include a justification and supporting data for such an extension.

The permittee may use the time for investigation to conduct a PTI or move directly into the TIE. A PTI consists of a brief search for possible sources of WET, which might reveal causes of such toxicity and appropriate corrective actions more simply and cost effectively than a formal TIE. If the PTI allows resolution of the WET incident, the TIE need not necessarily be conducted. If, however, WET is not identified or resolved during the PTI, the TIE must be conducted within the allowed 120 day time frame.

Any permittee that is required to conduct a PTI/TIE investigation shall do so in conformance with procedures identified in the following documents, or as subsequently updated: 1) Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I, EPA/600/6-91/005F May 92, 2) Methods for Aquatic Toxicity Identification Evaluations, Phase I Toxicity Characterization Procedures, EPA/600/6-91/003 Feb. 91 and 3) Methods for Aquatic Toxicity Identification Evaluations, Phase II Toxicity Identification Procedures, EPA/600/3-88/035 Feb. 1989.

A fourth document in this series is Methods for Aquatic Toxicity Identification Evaluations, Phase III Toxicity Confirmation Procedures, EPA/600/3-88/036 Feb. 1989. As indicated by the title, this procedure is intended to confirm that the suspected toxicant is truly the toxicant. This investigation is optional.

Within 90 days of the determination of the toxicant or no later than 210 days after demonstration of toxicity, whichever is sooner, a control program is to be developed and received by the Division. The program shall set down a method and procedure for elimination of the toxicity to acceptable levels.

(f) Request For Relief

The permittee may request relief from further investigation and testing where the toxicant has not been determined and the Division has determined suitable treatment does not appear possible. In requesting such relief, the permittee shall submit material sufficient to establish the following:

- (i) It has complied with terms and conditions of the permit compliance schedule for the PTI/TIE investigation and other appropriate conditions as may have been required by the Division;
- (ii) During the period of the toxicity incident it has been in compliance with all other permit conditions, including, in the case of a POTW, pre-treatment requirements;
- (iii) During the period of the toxicity incident it has properly maintained and operated all facilities and systems of treatment and control; and
- (iv) Despite the circumstances described in paragraphs (i) and (iii) above, the source and/or cause of toxicity could not be located or resolved.

If deemed appropriate by the Division, the permit or the compliance schedule may be modified to revise the ongoing monitoring and toxicity investigation requirements to avoid an unproductive expenditure of the permittee's resources, provided that the underlying obligation to eliminate any continuing exceedance of the toxicity limit shall remain.

(g) Spontaneous Disappearance

If toxicity spontaneously disappears at any time after a test failure, the permittee shall notify the Division in writing within 14 days of a demonstration of disappearance of the toxicity. The Division may require the permittee to develop and submit additional information which may include, but is not limited to, the results of additional testing. If no pattern of toxicity is identified or recurring toxicity is not identified, the toxicity incident response is considered closed and normal WET testing shall resume.

(h) Toxicity Reopener

This permit may be reopened and modified (following proper administrative procedures) to include new compliance dates, additional or modified numerical permit limitations, a new or different compliance schedule, a change in the whole effluent toxicity testing protocol, or any other conditions related to the control of toxicants if one or more of the following events occur:

- (i) Toxicity has been demonstrated in the effluent and the permit does not contain a toxicity limitation.
- (ii) The PTI/TIE results indicate that the toxicant (s) represent pollutant(s) that may be controlled with specific numerical limits, and the Division agrees that the numerical controls are the most appropriate course of action.
- (iii) The PTI/TIE reveals other unique conditions or characteristics which, in the opinion of the Division, justify the incorporation of unanticipated special conditions in the permit.
- (iv) The Division may reopen this permit and impose chronic toxicity limits where chronic toxicity is identified.

## B. MONITORING REQUIREMENTS

### 1. Frequency and Sample Type

In order to obtain an indication of the probable compliance or noncompliance with the effluent limitations specified in Part I.A.1, the permittee shall monitor all effluent parameters at the following frequencies. Such monitoring will begin immediately and last for the life of the permit unless otherwise noted. The results of such monitoring shall be reported on the Discharge Monitoring Report form (See Part I.E.)

<u>Effluent Parameter</u>	<u>Monitoring Frequency</u>	<u>Sample Type</u>
<b><u>For Point 004A</u></b>		
Flow, MGD	Weekly	Instantaneous
pH, su	Weekly	In-Situ
Oil and Grease, mg/l	Weekly	Visual
TSS, mg/l	Weekly	Grab
Cadmium, Total, mg/l	Weekly	Grab
Copper, Total, mg/l	Weekly	Grab
Lead, Total, mg/l	Weekly	Grab
Zinc, Total, mg/l	Weekly	Grab
TDS, mg/l	Quarterly	Grab
<b><u>For Point 004X - Applicable Only Until Treatment of Cement Creek Begins</u></b>		
Whole Effluent Toxicity, Chronic	Quarterly	3 Composites

Self-monitoring sampling by the permittee for compliance with the monitoring requirements specified above shall be performed at the following location(s): 004A and 004X, the outfall from the fourth treatment pond to Cement Creek.

If the permittee, using the approved analytical methods, monitors any parameter more frequently than required by this permit, then the results of such monitoring shall be included in the calculation and reporting of the values required in the Discharge Monitoring Report Form (DMRs) or other forms as required by the Division. Such increased frequency shall also be indicated.

### Oil and Grease Monitoring

For every outfall with oil and grease monitoring, in the event an oil sheen or floating oil is observed, a grab sample shall be collected, analyzed, and reported on the appropriate DMR. In addition, corrective action shall be taken immediately to mitigate the discharge of oil and grease. A description of the corrective action taken should be included with the DMR.

### C. DEFINITIONS OF TERMS

1. "Daily Maximum limitation" means the limitation for this parameter shall be applied as an instantaneous maximum (or, for pH or DO, instantaneous minimum) value. The instantaneous value is defined as the analytical result of any individual sample. DMRs shall include the maximum (and/or minimum) of all instantaneous values within the calendar month. Any instantaneous value beyond the noted daily maximum limitation for the indicated parameter shall be considered a violation of this permit.
2. "Grab" sample, is a single "dip and take" sample so as to be representative of the parameter being monitored.
3. "In-situ" measurement is defined as a single reading, observation or measurement taken in the field at the point of discharge.
4. "Instantaneous" measurement is a single reading, observation, or measurement performed on site using existing monitoring facilities.
5. "Quarterly measurement frequency" means samples may be collected at any time during the calendar quarter if a continual discharge occurs. If the discharge is intermittent, then samples shall be collected during the period that discharge occurs.
6. "Seven (7) day average" means, with the exception of fecal coliform bacteria, the arithmetic mean of all samples collected in a seven (7) consecutive day period. For fecal coliform bacteria, it is the geometric mean of all samples taken in a seven (7) consecutive day period. Such seven (7) day averages shall be calculated for all calendar weeks, which are defined as beginning on Sunday and ending on Saturday. If the calendar week overlaps two months (i.e. the Sunday is in one month and the Saturday in the following month), the seven (7) day average calculated for that calendar week shall be associated with the month that contains the Saturday. Samples may not be used for more than one (1) reporting period. (Not applicable to fecal coliform determinations.)
7. "Thirty (30) day average" means, except for fecal coliform bacteria, the arithmetic mean of all samples collected during a thirty (30) consecutive-day period. For fecal coliform bacteria, it is the geometric mean of all samples collected in a thirty (30) day period. The permittee shall report the appropriate mean of all self-monitoring sample data collected during the calendar month on the Discharge Monitoring Reports. Samples shall not be used for more than one (1) reporting period.
8. "Total Metals" means the concentration of metals determined on an unfiltered sample following vigorous digestion (Section 4.1.3), or the sum of the concentrations of metals in both the dissolved and suspended fractions, as described in "*Manual of Methods for Chemical Analysis of Water and Wastes*," U.S. Environmental Protection Agency, March 1979, or its equivalent.
9. "Visual" observation is observing the discharge to check for the presence of a visible sheen or floating oil.
10. "Water Quality Control Division" or "Division" means the state Water Quality Control Division as established in 25-8-101 et al.)

Additional relevant definitions are found in the Colorado Water Quality Control Act, CRS §§ 25-8-101 et seq., the *Regulations for the State Discharge Permit System*, 5 CCR 1002-2, § 6.1.0 et seq and other applicable regulations.

### D. SPECIAL REQUIREMENTS

#### 1. Materials Containment Plan

Pursuant to Sections 6.9.3 (6) and (9) of the Regulations for the State Discharge Permit System, the permittee is required to submit a Materials Containment Plan. Such a plan was previously submitted to the Division. An update of the plan shall be submitted to the Division within ninety (90) days after the effective date of this permit and must be implemented. The update of the plan shall include changes in the information and procedures for the prevention and containment of spills of materials used, processed or stored at the facility which if spilled would have a reasonable probability of having a visible or otherwise detrimental impact on waters of the State <sup>1/2</sup>. The updated plan shall include, but not necessarily be limited to:

- a. An updated history of the spills which have occurred in the three (3) years preceding the effective date of this permit. The history shall include a discussion on the cause of the spills and a the preventative measures designed to eliminate them from reoccurring;
- b. An update of the reporting system which will be used to notify, at a minimum, responsible facility management, the Division, the Environmental Protection Agency, downstream water users within 5 miles downstream of the facility, and local health officials;
- c. A description of any changes in the preventative facilities (including overall facility plot) which prevent, contain, or treat spills and unplanned discharges;
- d. A current list which includes the volumes or quantities of all materials used, processed, or stored at the facility which represent a potential spill threat to surface waters. The location of stored material shall be indicated on the facility plot submitted for item c;
- e. An implementation schedule for additional facilities which might be required in item c, but which are not yet operational;
- f. A current list of available outside contractors, agencies, or other sources which could be utilized in the event of a spill in order to clean up its effects. If the facility is capable of handling spills in-house, this shall be documented in the plan;
- g. Provision for yearly review and updating of the contingency plan, plus resubmission of the plan to the Division if conditions and/or procedures at the facility change the original plan.

The foregoing provisions shall in no way render inapplicable those requirements imposed by the Federal Water Pollution Control Act, 33 U.S.C. § 1321, regulations promulgated thereunder, the Colorado Water Quality Control Act, and regulations promulgated thereunder. It is recommended that this plan be prepared by a professional engineer registered in the State of Colorado.

Nothing herein contained shall be construed as allowing any discharge to waters of the State other than through the discharge points specifically authorized in this permit. Nothing herein contained shall be construed as excusing any liability the permittee might have, civil or criminal, for any spill.

The submittal of a Spill Prevention Control and Countermeasure Plan (SPCC Plan) as required by 40 CFR Part 112 may satisfy all or part of this requirement. Should additional materials exist on site which are not addressed in the SPCC Plan, addressing those materials as per the above is required.

- 1/ If there is no such material present at the site, this shall be indicated in writing and submitted to the Division for review.
- 2/ If there is material present but the permittee feels there is not a reasonable probability of a spill impacting waters of the State, this shall be documented in writing and submitted to the Division for review. This documentation shall include; 1) distance to nearest surface waters, and; 2) a detailed description of any structure which prohibits the release of material onto the ground or into a conveyance system.

## **2. Stormwater Requirements**

Stormwater permitting requirements, for discharges consisting of stormwater only, have been and will continue to be implemented through a separate stormwater permit.

## **E. GENERAL MONITORING, SAMPLING AND REPORTING REQUIREMENTS**

### **1. Routine Reporting of Data**

Reporting of the data gathered in compliance with Part I.B.1 shall be on a monthly basis. Reporting of all data gathered shall comply with the requirements of Part I.E. (General Requirements). Monitoring results shall be summarized for each calendar month and reported on Division approved discharge monitoring report (DMR) forms (EPA form 3320-1). The forms shall be mailed to the agencies listed below so they are received no later than the 28th day of the following month. If no discharge occurs during the reporting period, "No Discharge" shall be reported.



The DMR forms consist of four pages - the top "original" copy, and three attached no-carbon-required copies. After the DMR form has been filled out and signed, the four copies must be separated and distributed as follows:

The first original signed copy of each discharge monitoring report (DMR) shall be submitted to the Division at the following address:

Colorado Department of Public Health and Environment  
WQCD-PE-B2  
4300 Cherry Creek Drive South  
Denver, Colorado 80222-1530

The first duplicate signed copy of each discharge monitoring report (DMR) shall be submitted to the following agency:

U.S. Environmental Protection Agency  
Water Management Division  
NPDES Branch 8WM-C  
999 18th Street, Suite 500  
Denver, CO 80202-2466

The third and fourth copies are for the permittee records. The Discharge Monitoring Report forms shall be filled out accurately and completely in accordance with requirements of this permit and the instructions on the forms. They shall be signed by an authorized person as identified in Part I.E.6.

Calculations for all limitations which require the averaging of measurements shall utilize an arithmetic mean unless otherwise specified by the Division in the permit.

## **2. Representative Sampling**

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. All samples shall be taken at the monitoring points specified in this permit and, unless otherwise specified, before the effluent joins or is diluted by any other wastestream, body of water, or substance. Monitoring points shall not be changed without notification to and approval by the Division.

If the permittee monitors at the point of discharge any pollutant limited by the permit more frequently than required by the permit, using approved test procedures or as specified in the permit, the result of this monitoring shall be included in the calculation and reporting of data to the Division.

## **3. Analytical and Sampling Methods for Monitoring**

The permittee shall install, calibrate, use and maintain monitoring methods and equipment, including biological and indicated pollutant monitoring methods. All sampling shall be performed by the permittee according to specified methods in 40 C.F.R. Part 136; methods approved by EPA pursuant to 40 C.F.R. Part 136; or methods approved by the Division, in the absence of a method specified in or approved pursuant to 40 C.F.R. part 136. **The analytical method selected for a parameter shall be the one that can measure the lowest detected limit for that parameter unless the permit limitation or stream standard for those parameters not limited, is within the testing range of another approved method.** When requested in writing, the Division may approve an alternative analytical procedure or any significant modification to an approved procedure.

When the most sensitive analytical method which complies with this part, has a detection limit greater than or equal to the permit limit, the permittee shall report "less than (the detectable limit)," as appropriate. Such reports shall not be considered as violations of the permit limit. The present lowest method detection limits for specific parameters (which have limitations which are, in some cases, less than or equal to the detection limit) are as follows:

Arsenic	0.01 mg/l
Benzene	0.001 mg/l
Total Residual Chlorine	0.05 mg/l
Cadmium	0.0003 mg/l
Chromium	0.01 mg/l
Chromium, Hexavalent	0.01 mg/l
Copper	0.005 mg/l
Lead	0.005 mg/l
Total Mercury	0.00025 mg/l
Nickel	0.05 mg/l
Selenium	0.01 mg/l
Silver	0.0002 mg/l
Zinc	0.05 mg/l

These limits apply to the total recoverable or the potentially dissolved fraction of metals.

For hexavalent chromium, samples must be unacidified so that dissolved concentrations will be measured rather than potentially dissolved concentrations. Procedure for determining settleable solids is contained in 40 CFR 434.64. The method detection limit for measuring settleable solids under this part shall be 0.4 ml/l.

#### 4. Records

The permittee shall establish and maintain records. Those records shall include the following:

- a. The date, type, exact location, and time of sampling or measurements;
- b. The individual(s) who performed the sampling or measurements;
- c. The date(s) the analyses were performed;
- d. The individual(s) who performed the analyses;
- e. The analytical techniques or methods used;
- f. The results of such analyses; and
- g. Any other observations which may result in an impact on the quality or quantity of the discharge as indicated in 40 CFR 122.44 (i)(1)(iii).

The permittee shall retain for a minimum of three (3) years records of all monitoring information, including all original strip chart recordings for continuous monitoring instrumentation, all calibration and maintenance records, copies of all reports required by this permit and records of all data used to complete the application for this permit. This period of retention shall be extended during the course of any unresolved litigation regarding the discharge of pollutants by the permittee or when requested by the Division or EPA.

#### 5. Flow Measuring Device

If not already a part of the permitted facility, within ninety (90) days after the effective date of the permit, a flow measuring device shall be installed to give representative values of effluent quantities at the respective discharge points. Unless specifically exempted, or modified in Part I.E.5 of this permit, a flow measuring device will be applicable at all designated discharge points.

At the request of the Division, the permittee shall show proof of the accuracy of any flow-measuring device used in obtaining data submitted in the monitoring report. The flow-measuring device must indicate values within ten (10) percent of the actual flow being discharged from the facility.

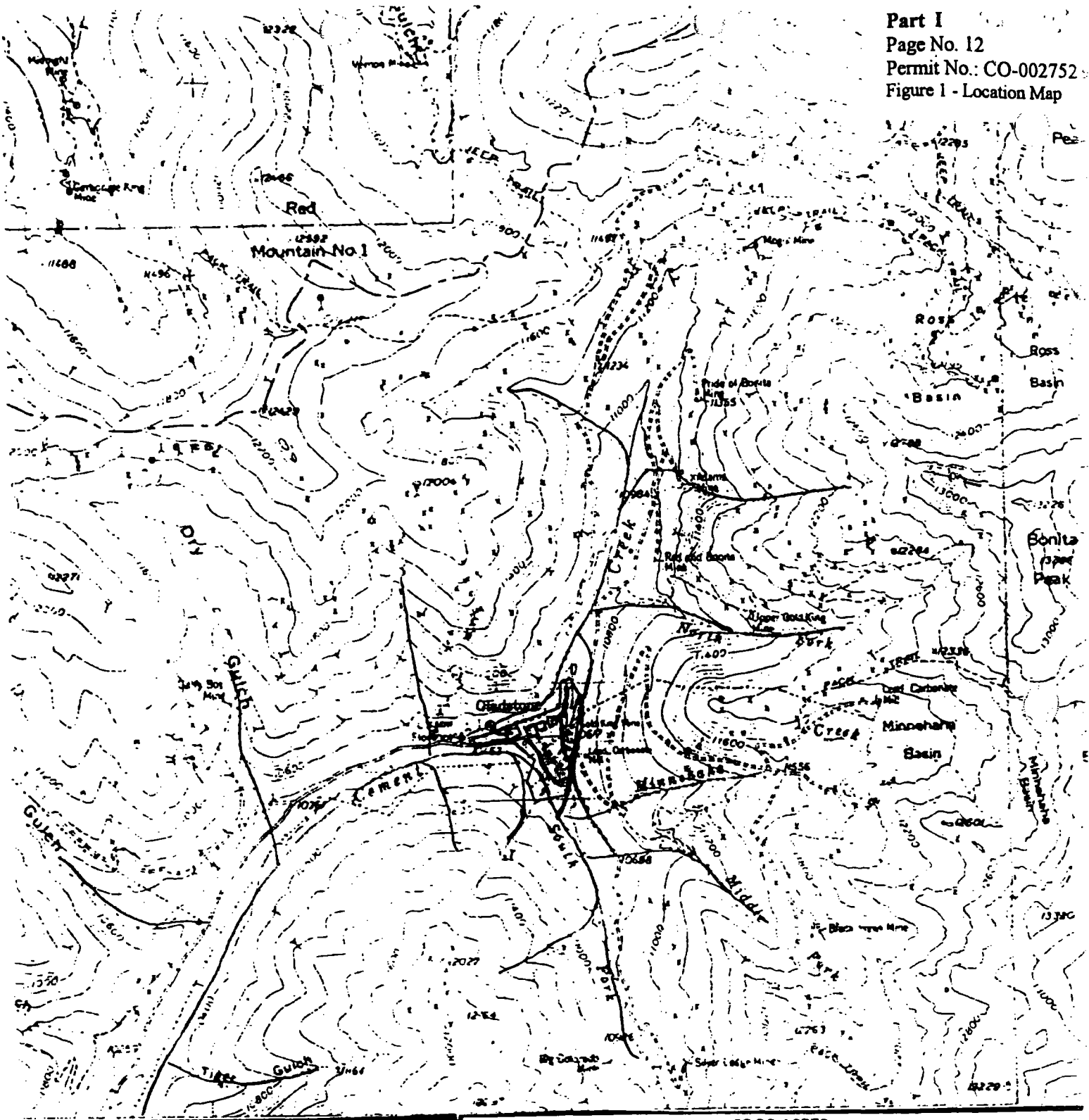
**6. Signatory and Certification Requirements**

- a. All reports and other information required by the Division, shall be signed and certified for accuracy by the permittee in accord with the following criteria:
  - (1) In the case of corporations, by a principal executive officer of at least the level of vice-president or his or her duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge described in the form originates;
  - (2) In the case of a partnership, by a general partner;
  - (3) In the case of a sole proprietorship, by the proprietor;
  - (4) In the case of a municipal, state, or other public facility, by either a principal executive officer, ranking elected official, or other duly authorized employee.
- b. All reports required by permits, and other information requested by the Division shall be signed by a person as described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:
  - (1) The authorization is made in writing by a person described above;
  - (2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and,
  - (3) The written authorization is submitted to the Division.

If an authorization as described in this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of this section must be submitted to the Division prior to or together with any reports, information, or applications to be signed by an authorized representative.

The permittee, or the duly authorized representative shall make and sign the following certification on all such documents:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."



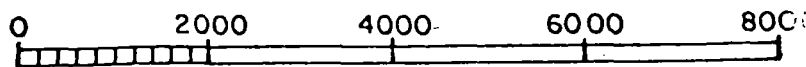
**SUNNYSIDE GOLD  
 CORPORATION  
 SAN JUAN COUNTY**

**SILVERTON, COLORADO**

U.S.G.S. QUAD. IRONTON PARK

PERMIT AREA = 22.96 ACRES  
 PERMIT AREA DRAINAGE  
 NATURAL WATER DRAINAGE  
 WATER MONITORING STATION

**SCALE: 1" = 2000'**  
**CONTOUR INTERVAL 40'**



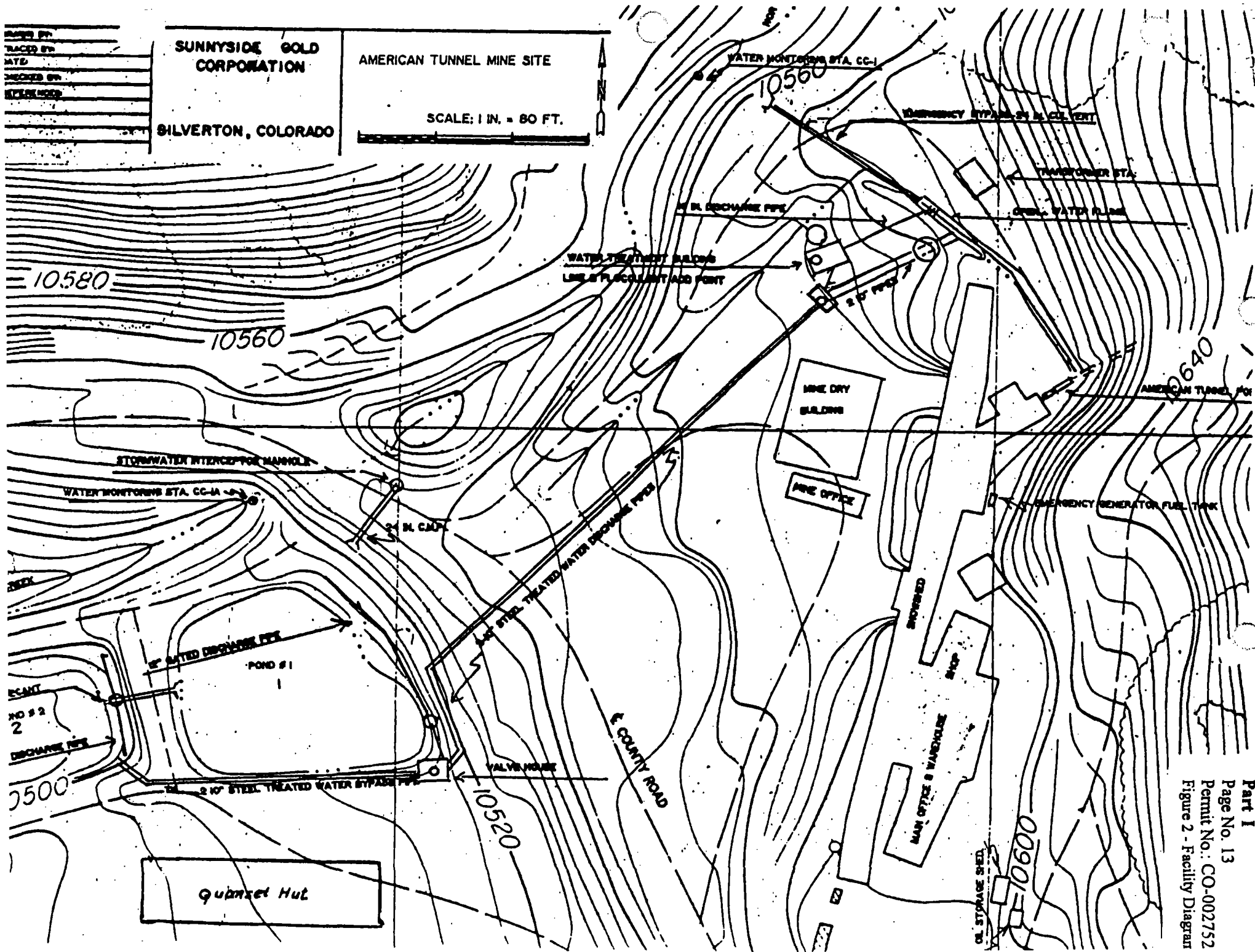
DRAWN BY  
 TRACED BY  
 DATE  
 CHECKED BY  
 REVISIONS

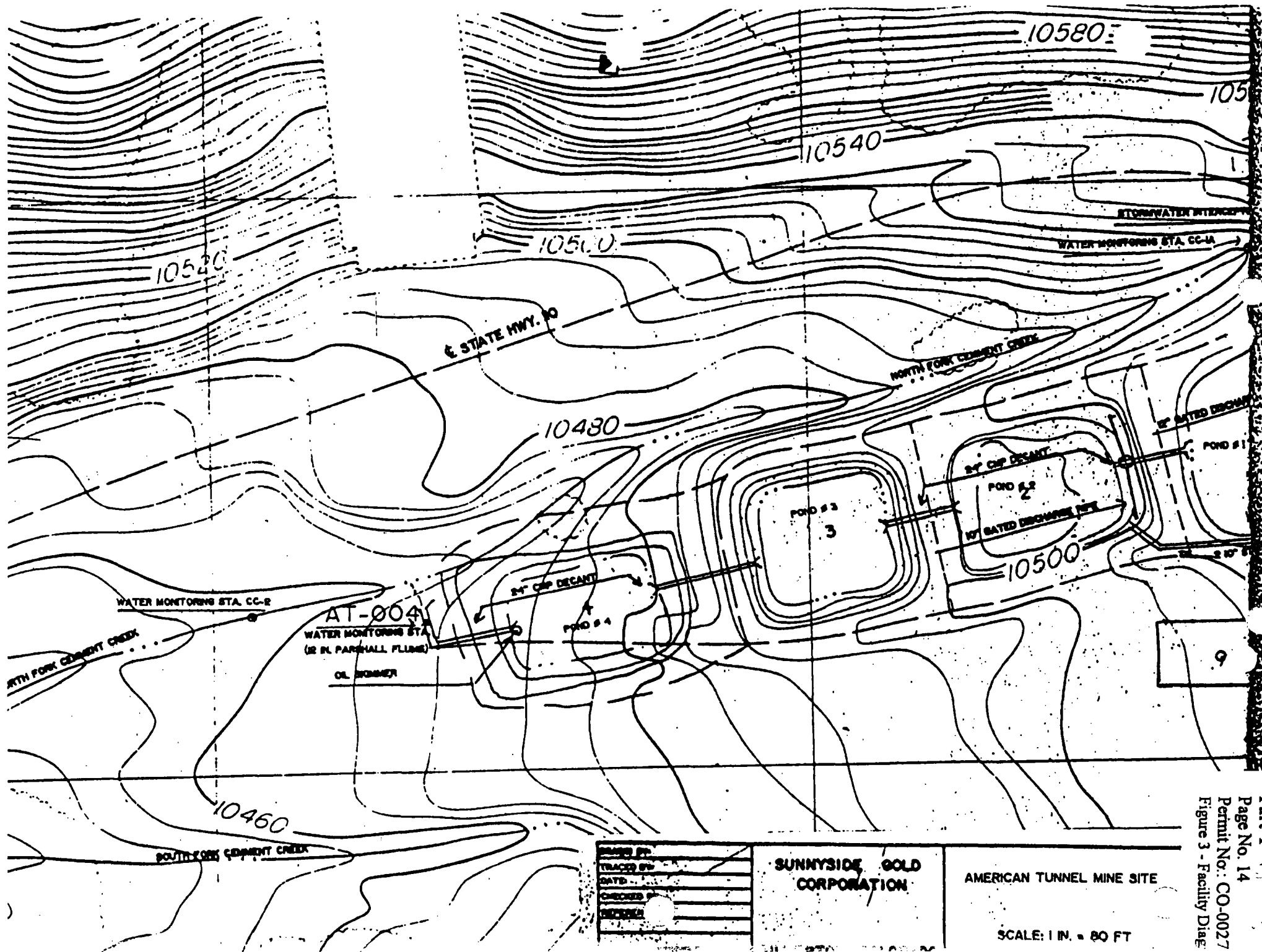
**SUNNYSIDE GOLD  
 CORPORATION**

AMERICAN TUNNEL MINE SITE

SILVERTON, COLORADO

SCALE: 1 IN. = 80 FT.





DESIGNED BY	
TRACED BY	
DATED	
CHECKED BY	
APPROVED BY	

**SUNNYSIDE GOLD CORPORATION**

**AMERICAN TUNNEL MINE SITE**

SCALE: 1 IN. = 80 FT

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Figure 3 - Facility Diagram

## A. NOTIFICATION REQUIREMENTS

### 1. Notification to Parties

All notification requirements under this section shall be directed as follows:

- a. Oral Notifications, other than for spills, during normal business hours shall be to:

Permits and Enforcement Section  
Water Quality Control Division  
Telephone : (303) 692-3590

Spills notifications at any time and other notifications after hours shall be to :

Emergency Response Unit  
Office of the Environment  
Telephone No.: (303)-756-4455

- b. Written notification shall be to:

Industrial Permits and Enforcement Program  
Colorado Department of Public Health and Environment  
WQCD-PE-B2  
4300 Cherry Creek Drive South  
Denver, Colorado 80222

### 2. Change in Discharge

The permittee shall notify the Division, in writing, of any planned physical alterations or additions to the permitted facility. Notice is required only when:

- a. The alteration or addition could significantly change the nature or increase the quantity or pollutants discharged; or
- b. The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported pursuant to an approved land application plan.

The permittee shall give advance notice to the Division of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

Whenever notification of any planned physical alterations or additions to the permitted facility is required pursuant to this section,, the permittee shall furnish the Division such plans and specifications which the Division deems reasonably necessary to evaluate the effect on the discharge, the stream, or ground water. If the Division finds that such new or altered discharge might be inconsistent with the conditions of the permit, the Division shall require a new or revised permit application and shall follow the procedures specified in Sections 6.6.0 through 6.7.0, and 6.16.0 of the Regulations for the State Discharge Permit System.

**3. Special Notifications - Definitions**

- a. Bypass: The intentional diversion of waste streams from any portion of a treatment facility.
- b. Severe Property Damage: Substantial physical damage to property at the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. It does not mean economic loss caused by delays in production.
- c. Spill: An incident in which flows or solid materials are accidentally or unintentionally allowed to flow or escape so as to be lost from the treatment, processing or manufacturing system which may cause or threaten pollution of state waters.
- d. Upset: An exceptional incident in which there is unintentional and temporary noncompliance with permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

**4. Noncompliance Notification**

- a. If, for any reason, the permittee does not comply with or will be unable to comply with any discharge limitations or standards specified in this permit, the permittee shall, at a minimum, provide the Division and EPA with the following information:
  - (1) A description of the discharge and cause of noncompliance;
  - (2) The period of noncompliance, including exact dates and times and/or the anticipated time when the discharge will return to compliance; and
  - (3) Steps being taken to reduce, eliminate, and prevent recurrence of the noncomplying discharge.
- b. The permittee shall report the following circumstances **orally within twenty-four (24) hours** from the time the permittee becomes aware of the circumstances, and shall mail to the Division a written report containing the information requested in Part II.A.3 (a) **within five (5) days** after becoming aware of the following circumstances:
  - (1) Circumstances leading to any noncompliance which may endanger health or the environment regardless of the cause of the incident;
  - (2) Circumstances leading to any unanticipated bypass which exceeds any effluent limitations in the permit;
  - (3) Circumstances leading to any upset or spill which causes an exceedance of any effluent limitation in the permit;
  - (4) Daily maximum violations for any of the pollutants limited by PART I.A of this permit and specified as requiring 24 hour notification. This includes any toxic pollutant or hazardous substance or any pollutant specifically identified as the method to control any toxic pollutant or hazardous substance.
- c. The permittee shall report instances of non-compliance which are not required to be reported within 24-hours at the time Discharge Monitoring Reports are submitted. The reports shall contain the information listed in sub-paragraph (a) of this section.

**5. Other Notification Requirements**

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule in the permit shall be submitted no later than fourteen (14) days following each scheduled date, unless otherwise provided by the Division.

The permittee shall notify the Division, in writing, thirty (30) days in advance of a proposed transfer of permit as provided in Part II.B.3.



The permittee's notification of all anticipated noncompliance does not stay any permit condition.

All existing manufacturing, commercial, mining, and silvicultural dischargers must notify the Division as soon as they know or have reason to believe:

- a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
  - (1) One hundred micrograms per liter (100 ug/l);
  - (2) Two hundred micrograms per liter (200 ug/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/l) for 2,4-dinitrophenol and 2-methyl-4,6-dinitrophenol; and one milligram per liter (1 mg/l) for antimony;
  - (3) Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with Section 6.5.2(7).
  - (4) The level established by the Division in accordance with 40 C.F.R. § 122.44(f).
- b. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
  - (1) Five hundred micrograms per liter (500 ug/l);
  - (2) One milligram per liter (1 mg/l) for antimony; and
  - (3) Ten (10) times the maximum concentration value reported for that pollutant in the permit application.
  - (4) The level established by the Division in accordance with 40 C.F.R. § 122.44(f).

#### 6. Bypass Notification

If the permittee knows in advance of the need for a bypass, a notice shall be submitted, at least ten days before the date of the bypass, to the Division. The bypass shall be subject to Division approval and limitations imposed by the Division. Violations of requirements imposed by the Division will constitute a violation of this permit.

#### 7. Upsets

##### a. Effect of an Upset

An upset constitutes an affirmative defense to an action brought for noncompliance with permit effluent limitations if the requirements of paragraph (b) of this section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

##### b. Conditions Necessary for a Demonstration of Upset

A permittee who wishes to establish the affirmative defense of upset shall demonstrate through properly signed contemporaneous operating logs, or other relevant evidence that:

- (1) An upset occurred and that the permittee can identify the specific cause(s) of the upset; and
- (2) The permitted facility was at the time being properly operated and maintained; and

- (3) The permittee submitted proper notice of the upset as required in Part II.A.4. of this permit (24-hour notice); and
- (4) The permittee complied with any remedial measure necessary to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

In addition to the demonstration required above, a permittee who wishes to establish the affirmative defense of upset for a violation of effluent limitations based upon water quality standards shall also demonstrate through monitoring, modeling or other methods that the relevant standards were achieved in the receiving water.

c. Burden of Proof

In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

8. Discharge Point

Any discharge to the waters of the State from a point source other than specifically authorized by this permit is prohibited.

9. Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee as necessary to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by the permittee only when necessary to achieve compliance with the conditions of the permit.

10. Minimization of Adverse Impact

The permittee shall take all reasonable steps to minimize or prevent any discharge of sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment. As necessary, accelerated or additional monitoring to determine the nature and impact of the noncomplying discharge is required.

11. Removed Substances

Solids, sludges, or other pollutants removed in the course of treatment or control of wastewaters shall be disposed in accordance with applicable state and federal regulations.

For all domestic wastewater treatment works, at industrial facilities, the permittee shall dispose of sludge in accordance with all State and Federal regulations.

12. Submission of Incorrect or Incomplete Information

Where the permittee failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or report to the Division, the permittee shall promptly submit the relevant information which was not submitted or any additional information needed to correct any erroneous information previously submitted

13. Bypass

a. Bypasses are prohibited and the Division may take enforcement action against the permittee for bypass, unless:

- (1) The bypass is unavoidable to prevent loss of life, personal injury, or severe property damage;
- (2) There were no feasible alternatives to bypass such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

- (3) Proper notices were submitted in compliance with Part II.A.4.
- b. "Severe property damage" as used in this Subsection means substantial physical damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
  - c. The permittee may allow a bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance or to assure optimal operation. These bypasses are not subject to the provisions of paragraph (a) above.
  - d. The Division may approve an anticipated bypass, after considering adverse effects, if the Division determines that the bypass will meet the conditions specified in paragraph (a) above.

**14. Reduction, Loss, or Failure of Treatment Facility**

The permittee has the duty to halt or reduce any activity if necessary to maintain compliance with the effluent limitations of the permit. Upon reduction, loss, or failure of the treatment facility, the permittee shall, to the extent necessary to maintain compliance with its permit, control production, control sources of wastewater, or all discharges, until the facility is restored or an alternative method of treatment is provided. This provision also applies to power failures, unless an alternative power source sufficient to operate the wastewater control facilities is provided.

It shall not be a defense for a permittee in an enforcement action that it would be necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

**B. RESPONSIBILITIES**

**1. Inspections and Right to Entry**

The permittee shall allow the Division and/or the authorized representative, upon the presentation of credentials:

- a. To enter upon the permittee's premises where a regulated facility or activity is located or in which any records are required to be kept under the terms and conditions of this permit;
- b. At reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit and to inspect any monitoring equipment or monitoring method required in the permit; and
- c. To enter upon the permittee's premises in a reasonable manner and at a reasonable time to inspect and/or investigate, any actual, suspected, or potential source of water pollution, or to ascertain compliance or non compliance with the Colorado Water Quality Control Act or any other applicable state or federal statute or regulation or any order promulgated by the Division. The investigation may include, but is not limited to, the following: sampling of any discharge and/or process waters, the taking of photographs, interviewing of any person having knowledge related to the discharge permit or alleged violation, access to any and all facilities or areas within the permittee's premises that may have any affect on the discharge, permit, or alleged violation. Such entry is also authorized for the purpose of inspecting and copying records required to be kept concerning any effluent source.
- d. The permittee shall provide access to the Division to sample the discharge at a point after the final treatment process but prior to the discharge mixing with state waters upon presentation of proper credentials.

In the making of such inspections, investigations, and determinations, the Division, insofar as practicable, may designate as its authorized representatives any qualified personnel of the Department of Agriculture. The Division may also request assistance from any other state or local agency or institution.

**2. Duty to Provide Information**

The permittee shall furnish to the Division, within a reasonable time, any information which the Division may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Division, upon request, copies of records required to be kept by this permit.

**3. Transfer of Ownership or Control**

- a. Except as provided in paragraph b. of this section, a permit may be transferred by a permittee only if the permit has been modified or revoked and reissued as provided in Section 6.9.8 of the Regulations for the State Discharge Permit System, to identify the new permittee and to incorporate such other requirements as may be necessary under the Federal Act.
- b. A permit may be automatically transferred to a new permittee if:
  - (1) The current permittee notifies the Division in writing 30 days in advance of the proposed transfer date; and
  - (2) The notice includes a written agreement between the existing and new permittee(s) containing a specific date for transfer of permit responsibility, coverage and liability between them; and
  - (3) The Division does not notify the existing permittee and the proposed new permittee of its intent to modify, or revoke and reissue the permit.
  - (4) Fee requirements of the Regulations for the State Discharge Permit System, Section 6.16.0 have been met.

**4. Availability of Reports**

Except for data determined to be confidential under Section 308 of the Federal Clean Water Act and Regulations for the State Discharge Permit System 5 CCR 1002-2, 6.6.4, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Division and the Environmental Protection Agency.

The name and address of the permit applicant(s) and permittee(s), permit applications, permits and effluent data shall not be considered confidential. Knowingly making false statement on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the Federal Clean Water Act, and Section 25-8-610 C.R.S.

**5. Modification, Suspension, Revocation, or Termination of Permits By the Division**

The filing of a request by the permittee for a permit modification, revocation and reissuance, termination or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

- a. A permit may be modified, suspended, or terminated in whole or in part during its term for reasons determined by the Division including, but not limited to, the following:
  - (1) Violation of any terms or conditions of the permit;
  - (2) Obtaining a permit by misrepresentation or failing to disclose any fact which is material to the granting or denial of a permit or to the establishment of terms or conditions of the permit; or
  - (3) Materially false or inaccurate statements or information in the permit application or the permit.
  - (4) A determination that the permitted activity endangers human health or the classified or existing uses of state waters and can only be regulated to acceptable levels by permit modifications or termination.
- b. A permit may be modified in whole or in part for the following causes, provided that such modification complies with the provisions of Section 6.11.0 of the Regulations for the State Discharge Permit System:

**Part II**

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Permit No.: CO-0027529

- (1) There are material and substantial alterations or additions to the permitted facility or activity which occurred after permit issuance which justify the application of permit conditions that are different or absent in the existing permit.
- (2) The Division has received new information which was not available at the time of permit issuance (other than revised regulations, guidance, or test methods) and which would have justified the application of different permit conditions at the time of issuance. For permits issued to new sources or new dischargers, this cause includes information derived from effluent testing required under Section 6.5.7(5) of the Regulations for the State Discharge Permit System. This provision allows a modification of the permit to include conditions that are less stringent than the existing permit only to the extent allowed under Section 6.11.0 of the Regulations for the State Discharge Permit System.
- (3) The standards or regulations on which the permit was based have been changed by promulgation of amended standards or regulations or by judicial decision after the permit was issued. Permits may be modified during their terms for this cause only as follows:
  - (a) The permit condition requested to be modified was based on a promulgated effluent limitation guideline, EPA approved water quality standard, or an effluent limitation set forth in 5 CCR 1002-3, § 10.1.0 et seq.; and
  - (b) EPA has revised, withdrawn, or modified that portion of the regulation or effluent limitation guideline on which the permit condition was based, or has approved a Commission action with respect to the water quality standard or effluent limitation on which the permit condition was based; and
  - (c) The permittee requests modification after the notice of final action by which the EPA effluent limitation guideline, water quality standard, or effluent limitation is revised, withdrawn, or modified; or
  - (d) For judicial decisions, a court of competent jurisdiction has remanded and stayed EPA promulgated regulations or effluent limitation guidelines, if the remand and stay concern that portion of the regulations or guidelines on which the permit condition was based and a request is filed by the permittee in accordance with this Regulation, within ninety (90) days of judicial remand.
- (4) The Division determines that good cause exists to modify a permit condition because of events over which the permittee has no control and for which there is no reasonable available remedy.
- (5) The permittee has received a variance.
- (6) When required to incorporate applicable toxic effluent limitation or standards adopted pursuant to § 307(a) of the Federal act.
- (7) When required by the reopener conditions in the permit.
- (8) As necessary under 40 C.F.R. 403.8(e), to include a compliance schedule for the development of a pretreatment program.
- (9) When the level of discharge of any pollutant which is not limited in the permit exceeds the level which can be achieved by the technology-based treatment requirements appropriate to the permittee under Section 6.9.2(1) of the Regulations for the State Discharge Permit System.
- (10) To establish a pollutant notification level required in Section 6.9.5 of the Regulations for the State Discharge Permit System.
- (11) To correct technical mistakes, such as errors in calculation, or mistaken interpretations of law made in determining permit conditions, to the extent allowed in Section 6.11.0 of the Regulations for the State Discharge Permit System.

- (12) When required by a permit condition to incorporate a land application plan for beneficial reuse of sewage sludge, to revise an existing land application plan, or to add a land application plan.
- (13) For any other cause provided in Section 6.11.0 of the Regulations for the State Discharge Permit System.
- c. At the request of a permittee, the Division may modify or terminate a permit and issue a new permit if the following conditions are met:
  - (1) The Regional Administrator has been notified of the proposed modification or termination and does not object in writing within thirty (30) days of receipt of notification,
  - (2) The Division finds that the permittee has shown reasonable grounds consistent with the Federal and State statutes and regulations for such modifications or termination;
  - (3) Requirements of Section 6.16.0 of the Regulations for the State Discharge Permit System have been met, and
  - (4) Requirements of public notice have been met.
- d. Permit modification (except for minor modifications), termination or revocation and reissuance actions shall be subject to the requirements of Sections 6.6.2, 6.6.3, 6.7.0, 6.8.0 and 6.16.0 of the Regulations for the State Discharge Permit System. The Division shall act on a permit modification request, other than minor modifications requests, within 180 days of receipt thereof. Except for minor modifications, the terms of the existing permit govern and are enforceable until the newly issued permit is formally modified or revoked and reissued following public notice.
- e. Upon consent by the permittee, the Division may make minor permit modifications without following the requirements of Sections 6.6.2, 6.6.3, 6.8.0, and 6.16.0 of the Regulations for the State Discharge Permit System. Minor modifications to permits are limited to:
  - (1) Correcting typographical errors; or
  - (2) Increasing the frequency of monitoring or reporting by the permittee; or
  - (3) Changing an interim date in a schedule of compliance, provided the new date of compliance is not more than 120 days after the date specific in the existing permit and does not interfere with attainment of the final compliance date requirement; or
  - (4) Allowing for a transfer in ownership or operational control of a facility where the Division determines that no other change in the permit is necessary, provided that a written agreement containing a specific date for transfer of permit responsibility, coverage and liability between the current and new permittees has been submitted to the Division; or
  - (5) Changing the construction schedule for a discharger which is a new source, but no such change shall affect a discharger's obligation to have all pollution control equipment installed and in operation prior to discharge; or
  - (6) Deleting a point source outfall when the discharge from that outfall is terminated and does not result in discharge of pollutants from other outfalls except in accordance with permit limits.
- f. When a permit is modified, only the conditions subject to modification are reopened. If a permit is revoked and reissued, the entire permit is reopened and subject to revision and the permit is reissued for a new term.
- g. The filing of a request by the permittee for a permit modification, revocation and reissuance or termination does not stay any permit condition.
- h. All permit modifications and reissuances are subject to the antibacksliding provisions set forth in 6.11.0 (5) through (9).

6. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject to under Section 311 (Oil and Hazardous Substance Liability) of the Clean Water Act.

7. State Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority granted by Section 510 of the Clean Water Act.

8. Permit Violations

Failure to comply with any terms and/or conditions of this permit shall be a violation of this permit. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of the permit.

9. Property Rights

The issuance of this permit does not convey any property or water rights in either real or personal property, or stream flows, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

10. Severability

The provisions of this permit are severable. If any provisions of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances and the application of the remainder of this permit shall not be affected.

11. Renewal Application

If the permittee desires to continue to discharge, a permit renewal application shall be submitted at least one hundred eighty (180) days before this permit expires. If the permittee anticipates there will be no discharge after the expiration date of this permit, the Division should be promptly notified so that it can terminate the permit in accordance with Part II.B.5.

12. Confidentiality

Any information relating to any secret process, method of manufacture or production, or sales or marketing data which has been declared confidential by the permittee, and which may be acquired, ascertained, or discovered, whether in any sampling investigation, emergency investigation, or otherwise, shall not be publicly disclosed by any member, officer, or employee of the Commission or the Division, but shall be kept confidential. Any person seeking to invoke the protection of this Subsection (12) shall bear the burden of proving its applicability. This section shall never be interpreted as preventing full disclosure of effluent data.

13. Fees

The permittee is required to submit payment of an annual fee as set forth in the 1983 amendments to the Water Quality Control Act. Section 25-8-502 (1) (b), and State Discharge Permit Regulations 5 CCR 1002-2, Section 6.16.0 as amended. Failure to submit the required fee when due and payable is a violation of the permit and will result in enforcement action pursuant to Section 25-8-601 et. seq., C.R.S. 1973 as amended.

**14. Duration of Permit**

The duration of a permit shall be for a fixed term and shall not exceed five (5) years. Filing of a timely and complete application shall cause the expired permit to continue in force to the effective date of the new permit. The permit's duration may be extended only through administrative extensions and not through interim modifications.

**15. Section 307 Toxics**

If a toxic effluent standard or prohibition, including any applicable schedule of compliance specified, is established by regulation pursuant to Section 307 of the Federal Act for a toxic pollutant which is present in the permittee's discharge and such standard or prohibition is more stringent than any limitation upon such pollutant in the discharge permit, the Division shall institute proceedings to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition.

**16. Antibacksliding**

- a. A permit may not be renewed, reissued, or modified to contain effluent limitations adopted pursuant to Section 25-8-503(1)(b) (BPJ) of the Water Quality Control Act, which are less stringent than the comparable effluent limitations or standards in the previous permit, unless any one of the following exceptions is met and the conditions of paragraph (c) of this section are met:
  - (1) Material and substantial alterations or additions to the permitted facility occurred after permit issuance which justify the application of less stringent effluent limitations; or
  - (2) Information is available which was not available at the time of permit issuance (other than revised regulations, guidance, or test methods) and which would have justified the application of a less stringent effluent limitation or standard at the time of permit issuance; or
  - (3) The Division determines that technical mistakes or mistaken interpretations of law were made in issuing the permit, which justified relaxation of the effluent limitations or standards; or
  - (4) A less stringent effluent limitation or standard is necessary because of events over which the permittee has no control and for which there is not reasonable available remedy; or
  - (5) The permittee has received a permit variance; or
  - (6) The permittee has installed the treatment facilities required to meet the effluent limitations in the previous permit and has properly operated and maintained the facilities but has nevertheless been unable to achieve the previous effluent limitations, in which case, the limitations in the renewed, reissued, or modified permit may reflect the level of pollutant control actually achieved (but shall not be less stringent than required by effluent guidelines in effect at the time of permit renewal, reissuance, or modification).
- b. A permit may not be renewed, reissued, or modified to contain effluent limitations adopted pursuant to 6.9.2(2) or (3) of the Regulations for the State Discharge Permit System that are less stringent than the comparable effluent limitations in the previous permit, unless any of the exceptions provided herein is met and the conditions of paragraph (c) of this section are met.
  - (1) In waters where the applicable water quality standard has not yet been attained, effluent limitations based on a total maximum daily load or other waste load allocation may be revised to be less stringent if the cumulative effect of all such revisions assures attainment of such water quality standard, or the designated use which is not being attained is removed in accordance with Section 3.1.6 of the Basic Standards.
  - (2) In waters where the applicable water quality standard has been attained, effluent limitations based on a total maximum daily load, other waste load allocation, or any other permitting standard (including any water quality standard) may be revised to be less stringent if such revision is subject to and consistent with the antidegradation provisions of Section 3.1.8 of the Basic Standards. Consistency with Section 3.1.8 shall be presumed if the waters in question have been designated by the Commission as "use protected"; or



(3) Whether or not the applicable water quality standard has been attained:

- (a) Material and substantial alterations or additions to the permitted facility occurred after permit issuance which justified the application of less stringent effluent limitations; or
  - (b) A less stringent effluent limitation is necessary because of events over which the permittee has no control and for which there is not reasonable available remedy; or
  - (c) The permittee has received a permit variance; or
  - (d) The permittee has installed the treatment facilities required to meet the effluent limitations in the previous permit and has properly operated and maintained the facilities but has nevertheless been unable to achieve the previous effluent limitations, in which case, the limitations in the reviewed, reissued, or modified permit may reflect the level of pollutant control actually achieved (but shall not be less stringent than required by effluent guidelines in effect at the time of permit renewal, reissuance, or modification).
- c. In no event may a permit with respect to which paragraphs (a) and (b) of this section apply be renewed, reissued, or modified to contain an effluent limitation or standard which is less stringent than required by federal effluent guidelines in effect at the time the permit is renewed, reissued, or modified. In no event may such a permit to discharge into state waters be renewed, reissued, or modified to contain a less stringent effluent limitation if the implementation of such limitation would result in a violation of an applicable water quality standard.

**17. Effect of Permit Issuance**

- a. The issuance of a permit does not convey any property rights or any exclusive privilege.
- b. The issuance of a permit does not authorize any injury to person or property or any invasion of personal rights, nor does it authorize the infringement of federal, state, or local laws or regulations.
- c. Except for any toxic effluent standard or prohibition imposed under Section 307 of the Federal act or any standard for sewage sludge use or disposal under Section 405(d) of the Federal act, compliance with a permit during its term constitutes compliance, for purposes of enforcement, with Sections 301, 302, 306, 318, 403, and 405(a) and (b) of the Federal act. However, a permit may be modified, revoked and reissued, or terminated during its term for cause as set forth in Section 6.9.8 of the Regulations for the State Discharge Permit System.
- d. Compliance with a permit condition which implements a particular standard for sewage sludge use or disposal shall be an affirmative defense in any enforcement action brought for a violation of that standard for sewage sludge use or disposal.

2018 MAR 15 AM 10: 54

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EPA REGION VIII  
HEARING CLERK

UNITED STATES  
ENVIRONMENTAL PROTECTION AGENCY  
REGION 8

IN THE MATTER OF:

Bonita Peak Mining District Superfund Site  
Bonita Peak Groundwater System  
Operable Unit 3,  
San Juan County, Colorado.

Sunnyside Gold Corporation,

Respondent.

Proceeding under Section 106(a)  
of the Comprehensive Environmental  
Response, Compensation, and Liability  
Act, 42 U.S.C. § 9606(a).

Docket No. CERCLA-08-2018-0005

**UNILATERAL ADMINISTRATIVE  
ORDER FOR REMEDIAL  
INVESTIGATION**

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## **I. JURISDICTION AND GENERAL PROVISIONS**

1. This Administrative Order (Order) is issued under the authority vested in the President of the United States by Section 106(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. § 9606(a). This authority was delegated to the Administrator of the United States Environmental Protection Agency (EPA) by Executive Order No. 12580, 52 Fed. Reg. 2923 (Jan. 23, 1987), and further delegated to the Regional Administrators by EPA Delegation Nos. 14-14A and 14-14B. The authority in Delegation No. 14-14-A was redelegated by the Regional Administrator of EPA Region 8 to the Assistant Regional Administrator, Office of Ecosystem Protection and Remediation on April 30, 2002. The authority in Delegation No. 14-14-B was redelegated by the Regional Administrator of EPA Region 8 to the Assistant Regional Administrator, Office of Enforcement, Compliance and Environmental Justice on January 30, 2017. Section 106(a) authority, as well as CERCLA Section 104 authority, has also been delegated to the Secretary of the Department of the Interior (Interior) by Executive Order No. 12580, as amended by Executive Order No. 13016, 61 Fed. Reg. 45871 (Aug. 30, 1996), with respect to any release or threatened release of hazardous substances affecting property subject to Interior's custody, jurisdiction, or control. Exercise of Interior's Section 106 authority is subject to the concurrence of EPA.

2. This Order pertains to Operable Unit 3 (OU3), the Bonita Peak Groundwater System, of the Bonita Peak Mining District Site (Site) in San Juan County, Colorado. This Order requires Respondent to prepare and perform a remedial investigation (RI) to determine the nature and extent of contamination at OU3 in order to abate an imminent and substantial endangerment to the public health or welfare or the environment that may be presented by the actual or threatened release of hazardous substances at or from OU3.

3. EPA has notified the State of Colorado (the State) of this action pursuant to Section 106(a) of CERCLA, 42 U.S.C. § 9606(a).

## **II. PARTIES BOUND**

4. This Order applies to and is binding upon Respondent and its successors and assigns. Any change in ownership or control of the Site or change in the corporate or partnership status of Respondent, including, but not limited to, any transfer of assets or real or personal property, shall not alter Respondent's responsibilities under this Order.

5. Respondent shall provide a copy of this Order to each contractor hired to perform the Work required by this Order and to each person representing Respondent with respect to the Site or the Work, and shall condition all contracts entered into under this Order upon performance of the Work in conformity with the terms of this Order. Respondent or its contractors shall provide written notice of the Order to all subcontractors hired to perform any portion of the Work required by this Order. Respondent shall nonetheless be responsible for ensuring that its contractors and subcontractors perform the Work in accordance with the terms of this Order.

### **III. DEFINITIONS**

6. Unless otherwise expressly provided in this Order, terms used in this Order that are defined in CERCLA or in regulations promulgated under CERCLA shall have the meaning assigned to them in CERCLA or in such regulations. Whenever terms listed below are used in this Order or in appendices to or documents incorporated by reference into this Order, the following definitions shall apply:

“Affected Property” shall mean all real property at the Site and any other real property where EPA determines, at any time, that access, land, water, or other resource use restrictions are needed to implement the RI.

“BLM” shall mean the United States Bureau of Land Management and its successor departments, agencies, or instrumentalities

“CERCLA” shall mean the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. §§ 9601-9675.

“Day” or “day” shall mean a calendar day. In computing any period of time under this Order, where the last day would fall on a Saturday, Sunday, or federal or State holiday, the period shall run until the close of business of the next working day.

“Effective Date” shall mean the effective date of this Order as provided in Section VIII.

“Engineering Controls” shall mean constructed containment barriers or systems that control one or more of the following: downward migration, infiltration, or seepage of surface runoff or rain; or natural leaching migration of contaminants through the subsurface over time. Examples include caps, engineered bottom barriers, immobilization processes, and vertical barriers.

“EPA” shall mean the United States Environmental Protection Agency and its successor departments, agencies, or instrumentalities.

“EPA Hazardous Substance Superfund” shall mean the Hazardous Substance Superfund established by the Internal Revenue Code, 26 U.S.C. § 9507.

“CDPHE” shall mean the Colorado Department of Public Health and Environment and any successor departments or agencies of the State.

“Institutional Controls” or “ICs” shall mean Proprietary Controls and state or local laws, regulations, ordinances, zoning restrictions, or other governmental controls or notices that: (a) limit land, water, or other resource use to minimize the potential for human exposure to Waste Material at or in connection with the Site; (b) limit land, water, or other resource use to implement, ensure non-interference with, or ensure the protectiveness of the response action pursuant to this Order; and/or (c) provide information intended to modify or guide human behavior at or in connection with the Site.

“Interest” shall mean interest at the rate specified for interest on investments of the EPA Hazardous Substance Superfund established by 26 U.S.C. § 9507, compounded annually on October 1 of each year, in accordance with 42 U.S.C. § 9607(a). The applicable rate of interest shall be the rate in effect at the time the interest accrues. The rate of interest is subject to change on October 1 of each year. Rates are available online at <https://www.epa.gov/superfund/superfund-interest-rates>.

“National Contingency Plan” or “NCP” shall mean the National Oil and Hazardous Substances Pollution Contingency Plan promulgated pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, codified at 40 C.F.R. Part 300, and any amendments thereto.

“Non-Respondent Owner” shall mean any person, other than Respondent, that owns or controls any Affected Property. The clause “Non-Respondent Owner’s Affected Property” means Affected Property owned or controlled by Non-Respondent Owner.

“Order” shall mean this Unilateral Administrative Order, all appendices attached hereto. In the event of conflict between this Order and any appendix, this Order shall control.

“Operable Unit 3” or “OU3” shall mean the Bonita Peak Groundwater System. The Bonita Peak Groundwater System generally includes the saturated and unsaturated workings of the Sunnyside Mine, associated drainage and haulage tunnels, nearby mines not known to be connected to the Sunnyside Mine by workings (e.g. Red & Bonita Mine and Gold King Mine), and the surrounding geographic area that may be hydraulically connected or influenced by current and/or historical releases from or management of these mines.

“Paragraph” shall mean a portion of this Order identified by an Arabic numeral or an upper or lower case letter.

“Parties” shall mean EPA and Respondent.

“Proprietary Controls” shall mean easements or covenants running with the land that (a) limit land, water, or other resource use and/or provide access rights and (b) are created pursuant to common law or statutory law by an instrument that is recorded in the appropriate land records office.

“RCRA” shall mean the Solid Waste Disposal Act, 42 U.S.C. §§ 6901-6992 (also known as the Resource Conservation and Recovery Act).

“Respondent” shall mean Sunnyside Gold Corporation.

“Response Costs” shall mean all costs, including, but not limited to, direct and indirect costs, that the United States incurs in monitoring and supervising Respondent’s performance of the Work to determine whether such performance is consistent with the requirements of this Order, including costs incurred in reviewing any deliverable submitted pursuant to this Order, as well as costs incurred in overseeing implementation of this Order, including, but not limited to, payroll costs, contractor costs, travel costs, and laboratory costs.

“Section” shall mean a portion of this Order identified by a Roman numeral.

“Site” shall mean the Bonita Peak Mining District Superfund Site, located in San Juan County, Colorado.

“State” shall mean the State of Colorado.

“Statement of Work” or “SOW” shall mean the document describing the activities Respondent must perform to develop the RI for OU3, as set forth in Appendix A to this Order. The Statement of Work is incorporated into this Order and is an enforceable part of this Order as are any modifications made thereto in accordance with this Order.

“Transfer” shall mean to sell, assign, convey, lease, mortgage, or grant a security interest in, or where used as a noun, a sale, assignment, conveyance, or other disposition of any interest by operation of law or otherwise.

“United States” shall mean the United States of America and each department, agency, and instrumentality of the United States, including EPA and BLM.

“Waste Material” shall mean: (a) any “hazardous substance” under Section 101(14) of CERCLA, 42 U.S.C. § 9601(14); (b) any pollutant or contaminant under Section 101(33) of CERCLA, 42 U.S.C. § 9601(33); and (c) any “solid waste” under Section 1004(27) of RCRA, 42 U.S.C. § 6903(27).

“Work” shall mean all activities and obligations Respondent is required to perform under this Order, except those required by Section XVI (Record Retention).

#### **IV. FINDINGS OF FACT**

7. The source areas of the Site are located within the headwaters of the Animas River watershed in the San Juan and Silverton calderas, which were subject to intensive hardrock mining beginning in the 1870s. The release of hazardous substances, primarily heavy metals, from the source areas at the Site are due to the operation and abandonment or discontinued operation of mines in the Upper Animas, Cement Creek and Mineral Creek drainages of the Animas River.

8. Mining at the Site began in the 1870s and the last significant mine to operate at the Site, the Sunnyside Mine, closed in 1991. The Sunnyside Mine, located within OU3, was the largest and most productive mining operation in the Site. The Sunnyside Mine is situated at the headwaters of the Eureka Gulch in the area of the historic Lake Emma at an elevation of approximately 12,320 feet. Mining at the Sunnyside Mine began with the discovery of gold on the Sunnyside claim in 1873 and ceased in 1991. SGC operated the Sunnyside Mine from 1985 to 1991 and acquired ownership of the Sunnyside Mine in 1992.

9. Years of mining and the installation of bulkheads have significantly influenced groundwater elevations within OU3. Historically, groundwater flowed along fractures and faults, with minimal leakage through bedrock, likely due to low primary permeability. With the advent of underground mining, bedrock groundwater that once followed natural fractures instead

followed the new path of least resistance, the networks of tunnels in the underground mine workings. Thus, drainage and haulage tunnels formed preferential flow paths for bedrock groundwater, leading to mine influenced water (MIW—water that is contaminated or influenced by mining-related activities) formation when water and air interact with these mineralized source areas within the tunnels.

10. Between 1996 and 2004, Respondent installed 11 bulkheads within the Sunnyside Mine workings to stop the uncontrolled flow of water from the Sunnyside Mine, including three locations in the American Tunnel (the primary drainage tunnel from the Sunnyside Mine) and one location in the Mogul Mine. The bulkheads modified the bedrock hydrogeology and resulted in changes in water flowing from surrounding mines. Prior to this installation of the bulkheads, MIW flowed from the Sunnyside Mine workings through the American Tunnel to Cement Creek. During this period, most of the surrounding mines showed little or no flow of MIW. After closure of the bulkheads, flow of MIW from the American Tunnel decreased substantially, but flow of MIW from the surrounding mines increased substantially. EPA installed a bulkhead at the nearby Red and Bonita Mine in 2015 with a flow through control valve that was left open due to uncertainty about how it would affect groundwater elevations and discharging adits.

11. Surface water sampling data from Cement Creek, Eureka Gulch, mine portals--including Mogul Mine, Red & Bonita Mine, and Gold King Mine—as well as seeps and springs in OU3 have shown elevated concentrations of mining-related CERCLA hazardous substances, as defined by Section 101(14) of CERCLA, 42 U.S.C. § 9601(14). The CERCLA hazardous substances identified at OU3 include: beryllium, cadmium, copper, lead, manganese, silver, and zinc.

12. The MIW flowing from the mine portals in OU3 has been measured to be as high as 1,500,000 gallons a day. These releases have resulted in pH depression and increases in dissolved toxic metal concentrations in surface water, including, but not limited to, cadmium, copper, zinc and manganese. Surface water sampling data from the early 2000s demonstrate that since installation of the bulkheads in the Sunnyside Mine workings, concentrations of hazardous substances, such as cadmium, copper, zinc and manganese, have increased substantially in Cement Creek and the Animas River below the confluence with Cement Creek.

13. EPA's 2015 Draft Baseline Ecological Risk Assessment concluded that the benthic invertebrate community is measurably impaired in most sections of the Animas River approximately 30 miles downstream to Bakers Bridge due to metals concentrations in surface water due to natural and mining-related sources at the Site. In addition, toxic metals concentrations in the Animas River below Cement Creek have eliminated virtually all fish down to Elk Creek (6 miles downstream) and all cutthroat and rainbow trout down to Cascade Creek (19 miles downstream), where only a small community of brook trout and brown trout exist. Due to natural processes, it is unlikely that Cement Creek ever supported fish communities. However, mining-related metals contamination in Cement Creek is a major source of contamination in the Animas River.

14. The Site was listed on the National Priorities List (NPL) by EPA pursuant to CERCLA Section 105, 42 U.S.C. § 9605, on September 9, 2016, 81 Fed. Reg. 62402.



15. Respondent is a corporation, incorporated in Delaware and authorized to do business in Colorado. Respondent is the present owner of mining claims in OU3 and previously operated the Sunnyside Mine, the largest mine in OU3.

16. No prior enforcement actions have been taken by EPA for OU3. However, Respondent has performed mine reclamation projects in the OU3 portion of the Site pursuant to a voluntary Consent Decree agreement with the Colorado Water Quality Control Division (WQCD) effective May 8, 1996 and pursuant to its mine permits.

## **V. CONCLUSIONS OF LAW AND DETERMINATIONS**

17. Based on the Findings of Fact set forth above and the administrative record, EPA has determined that:

a. OU3 of the Site is a “facility” as defined by Section 101(9) of CERCLA, 42 U.S.C. § 9601(9).

b. Respondent is a “person” as defined by Section 101(21) of CERCLA, 42 U.S.C. § 9601(21).

c. Respondent is a liable party under one or more provisions of Section 107(a) of CERCLA, 42 U.S.C. § 9607(a).

(1) Respondent is the “owner” and/or “operator” of the facility, as defined by Section 101(20) of CERCLA, 42 U.S.C. § 9601(20), and within the meaning of Section 107(a)(1) of CERCLA, 42 U.S.C. § 9607(a)(1).

(2) Respondent was the “owner” and/or “operator” of the facility at the time of disposal of hazardous substances at the facility, as defined by Section 101(20) of CERCLA, 42 U.S.C. § 9601(20), and within the meaning of Section 107(a)(2) of CERCLA, 42 U.S.C. § 9607(a)(2).

(3) Respondent arranged for disposal or treatment, or arranged with a transporter for transport for disposal or treatment of hazardous substances at the facility, within the meaning of Section 107(a)(3) of CERCLA, 42 U.S.C. § 9607(a)(3).

d. The metals contamination found at the Site, as identified in the Findings of Fact above, includes “hazardous substances” as defined by Section 101(14) of CERCLA, 42 U.S.C. § 9601(14).

e. The conditions described in Paragraphs 11 and 12 of the Findings of Fact above constitute an actual and/or threatened “release” of a hazardous substance from the facility as defined by Section 101(22) of CERCLA, 42 U.S.C. § 9601(22).

f. The conditions at the Site may constitute a threat to public health or welfare or the environment, based on the factors set forth in Section 300.415(b)(2) of the NCP. These factors include, but are not limited to, the following:

- (1) actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances; this factor is present at the Site due to the existence of heavy metals released from the mine portals and seeps and springs in OU3 which adversely affect aquatic receptors in downstream receiving waterbodies. EPA's 2015 draft Baseline Ecological Risk Assessment for the watershed indicates adverse ecological risks to aquatic receptors in Cement Creek. The 2015 draft Baseline Ecological Risk Assessment found that the water quality in Cement Creek would cause lethal stress to fish and would be acutely toxic to juvenile rainbow trout; and
- (2) the unavailability of other appropriate federal or state mechanisms to respond to the release; this factor supports the actions required by this Order at the Site because EPA is the lead agency at the BPMD Site. There are no other appropriate federal or state entities that have the funding resources to perform the remedial investigation at OU3.

g. The conditions at OU3 of the Site may constitute an imminent and substantial endangerment to public health or welfare or the environment.

h. The actions required by this Order are necessary to protect the public health, welfare, or the environment.

## **VI. ORDER**

18. Based upon the Findings of Fact, Conclusions of Law and Determinations set forth above, and the administrative record, Respondent is hereby ordered to comply with all provisions of this Order and any modifications to this Order, including all appendices to this Order and all documents incorporated by reference into this Order.

## **VII. OPPORTUNITY TO CONFER**

19. No later than 5 days after this Order is signed by the Regional Administrator or his delegatee, Respondent may, in writing, a) request a conference with EPA to discuss this Order, including its applicability, the factual findings and the determinations upon which it is based, the appropriateness of any actions Respondent is ordered to take, or any other relevant and material issues or contentions that Respondent may have regarding this Order, or b) notify EPA that they intend to submit written comments or a statement of position in lieu of requesting a conference.

20. If a conference is requested, Respondent may appear in person or by an attorney or other representative. Any such conference shall be held no later than 5 days after the conference is requested. Any written comments or statements of position on any matter pertinent

to this Order must be submitted no later than 5 days after the conference or 10 days after this Order is signed if Respondent does not request a conference. This conference is not an evidentiary hearing, does not constitute a proceeding to challenge this Order, and does not give Respondent a right to seek review of this Order. Any request for a conference or written comments or statements should be submitted to:

Richard Sisk, Attorney, Legal Enforcement Program,  
Office of Enforcement, Compliance and Environmental Justice  
U.S. Environmental Protection Agency Region 8  
1595 Wynkoop Street  
Denver, CO 80202-1129  
Mailcode 8ENF-L  
303-312-6638  
Sisk.richard@epa.gov

### **VIII. EFFECTIVE DATE**

21. This Order shall be effective 5 days after the Order is signed by the Regional Administrator or his delegatee unless a conference is requested or notice is given that written materials will be submitted in lieu of a conference in accordance with Section VII (Opportunity to Confer). If a conference is requested or such notice is submitted, this Order shall be effective on the 10<sup>th</sup> day after the conference, or if no conference is requested, the 10<sup>th</sup> day after written materials, if any, are submitted, unless EPA determines that the Order should be modified based on the conference or written materials. In such event, EPA shall notify Respondent, within the applicable 10-day period, that EPA intends to modify the Order. The modified Order shall be effective 5 days after it is signed by the Regional Administrator or his delegatee.

### **IX. NOTICE OF INTENT TO COMPLY**

22. On or before the Effective Date, Respondent shall notify EPA in writing of Respondent's irrevocable intent to comply with this Order. Such written notice shall be sent to EPA as provided in Paragraph 20. Respondent's written notice shall describe, using facts that exist on or prior to the Effective Date, any "sufficient cause" defense(s) asserted by Respondent under Sections 106(b) and 107(c)(3) of CERCLA, 42 U.S.C. §§ 9606(b) and 9607(c)(3). The absence of a response by EPA to the notice required by this Paragraph shall not be deemed to be acceptance of Respondent's assertions. Failure of Respondent to provide such written notice within this time period shall, as of the Effective Date, be treated as a violation of this Order by Respondent.

### **X. DESIGNATION OF CONTRACTORS AND PROJECT COORDINATORS**

23. **Selection of Contractors, Personnel.** All Work performed under this Order shall be under the direction and supervision of qualified personnel. Within 30 days after the Effective Date, and before the Work outlined below begins, Respondent shall notify EPA in writing of the names, titles, addresses, telephone numbers, email addresses, and qualifications of the personnel, including contractors, subcontractors, consultants, and laboratories to be used in carrying out

such Work. If, after the commencement of Work, Respondent retains additional contractors or subcontractors, Respondent shall notify EPA of the names, titles, contact information, and qualifications of such contractors or subcontractors retained to perform the Work at least 30 days prior to commencement of Work by such additional contractors or subcontractors. EPA retains the right, at any time, to disapprove of any or all of the contractors and/or subcontractors retained by Respondent. If EPA disapproves of a selected contractor or subcontractor, Respondent shall retain a different contractor or subcontractor and shall notify EPA of that contractor's or subcontractor's name, title, contact information, and qualifications within 30 days after EPA's disapproval. With respect to any proposed contractor, Respondent shall demonstrate that the proposed contractor demonstrates compliance with ASQ/ANSI E4:2014 "Quality management systems for environmental information and technology programs – Requirements with guidance for use" (American Society for Quality, February 2014), by submitting a copy of the proposed contractor's Quality Management Plan (QMP). The QMP should be prepared in accordance with "EPA Requirements for Quality Management Plans (QA/R-2)," EPA/240/B-01/002 (Reissued May 2006) or equivalent documentation as determined by EPA. The qualifications of the persons undertaking the Work for Respondent shall be subject to EPA's review for verification based on objective assessment criteria (e.g., experience, capacity, technical expertise) and that they do not have a conflict of interest with respect to the project.

24. Within 15 days after the Effective Date, Respondent shall designate a Project Coordinator who shall be responsible for administration of the Work required by this Order and shall submit to EPA the designated Project Coordinator's name, title, address, telephone number, email address, and qualifications. To the greatest extent possible, the Project Coordinator shall be present on-Site or readily available during the Work. EPA retains the right to disapprove of a designated Project Coordinator who does not meet the requirements of Paragraph 23 (Selection of Contractors, Personnel). If EPA disapproves of the designated Project Coordinator, Respondent shall retain a different Project Coordinator and shall notify EPA of that person's name, title, contact information, and qualifications within 10 days following EPA's disapproval. Respondent shall have the right to change their Project Coordinator, subject to EPA's right to disapprove. Respondent shall notify EPA 10 days before such a change is made. The initial notification may be made orally, but shall be promptly followed by a written notification. Communications between Respondent and EPA, and all documents concerning the activities performed pursuant to this Order, shall be directed to the Project Coordinator. Receipt by Respondent's Project Coordinator of any notice or communication from EPA relating to this Order shall constitute receipt by Respondent.

25. EPA designated Jamie Miller of the Superfund Remedial Program, Region 8, as its Project Coordinator or Remedial Project Manager (RPM). EPA will notify Respondent of a change of its designated RPM. Communications between Respondent and EPA, and all documents concerning the activities performed pursuant to this Order, shall be directed to the EPA RPM in accordance with Paragraph 34.a.

26. EPA's RPM shall have the authority lawfully vested in a RPM and On-Scene Coordinator (OSC) by the NCP. In addition, EPA's RPM shall have the authority, consistent with the NCP, to halt, conduct, or direct any Work required by this Order, or to direct any other response action when s/he determines that conditions at the Site constitute an emergency situation or may present a threat to public health or welfare or the environment. Absence of the

EPA RPM from the area under study pursuant to this Order shall not be cause for stoppage or delay of Work.

## **XI. WORK TO BE PERFORMED**

27. For any regulation or guidance referenced in the Order, the reference will be read to include any subsequent modification, amendment, or replacement of such regulation or guidance. Such modifications, amendments, or replacements apply to the Work only after Respondent receives notification from EPA of the modification, amendment, or replacement.

28. Respondent shall conduct the RI and prepare all plans in accordance with the provisions of this Order, the attached SOW, CERCLA, the NCP, and EPA guidance, including, but not limited to, the “Interim Final Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA” (RI/FS Guidance), OSWER Directive # 9355.3-01 (October 1988), available at <https://semspub.epa.gov/src/document/11/128301>, “Guidance for Data Useability in Risk Assessment (Part A), Final,” OSWER Directive #9285.7-09A, PB 92-963356 (April 1992), available at <http://semspub.epa.gov/src/document/11/156756>, and guidance referenced therein, and guidance referenced in the SOW. The RI shall consist of collecting data to characterize OU3 conditions, determining the nature and extent of the contamination at or from the Site.

29. All written documents prepared by Respondent pursuant to this Order shall be submitted by Respondent in accordance with Section XII (Submission and Approval of Deliverables). With the exception of progress reports and the Health and Safety Plan, all such submittals will be reviewed and approved by EPA in accordance with Section XII (Submission and Approval of Deliverables). Respondent shall implement all EPA approved, conditionally approved, or modified deliverables.

### **30. Modification of the RI Work Plan**

a. If at any time during the RI process, Respondent identifies a need for additional data, Respondent shall submit a memorandum documenting the need for additional data to EPA’s RPM within 10 days after identification. EPA in its discretion will determine whether the additional data will be collected by Respondent and whether it will be incorporated into deliverables.

b. In the event of unanticipated or changed circumstances at the Site, Respondent shall notify EPA’s RPM by telephone within 24 hours of discovery of the unanticipated or changed circumstances. In the event that EPA determines that the unanticipated or changed circumstances warrant changes in the RI Work Plan, EPA shall modify the RI Work Plan in writing accordingly or direct Respondent to modify and submit the modified RI Work Plan to EPA for approval. Respondent shall perform the RI Work Plan as modified.

c. EPA may determine that, in addition to tasks defined in the initially approved RI Work Plan, other additional work may be necessary to accomplish the objectives of the RI. Respondent shall perform these response actions in addition to those required by the initially approved RI Work Plan, including any approved modifications, if EPA determines that such actions are necessary for a thorough RI.

d. Respondent shall complete the additional work according to the standards, specifications, and schedule set forth or approved by EPA in a written modification to the RI Work Plan or written RI Work Plan supplement. EPA reserves the right to conduct the work itself, to seek reimbursement from Respondent for the costs incurred in performing the work, and/or to seek any other appropriate relief.

e. Nothing in this Paragraph shall be construed to limit EPA's authority to require performance of further response actions at the Site.

### 31. **Off-Site Shipments**

a. Respondent may ship hazardous substances, pollutants, and contaminants from the Site to an off-Site facility only if they comply with Section 121(d)(3) of CERCLA, 42 U.S.C. § 9621(d)(3), and 40 C.F.R. § 300.440. Respondent will be deemed to be in compliance with CERCLA § 121(d)(3) and 40 C.F.R. § 300.440 regarding a shipment if Respondent obtains a prior determination from EPA that the proposed receiving facility for such shipment is acceptable under the criteria of 40 C.F.R. § 300.440(b).

b. Respondent may ship Waste Material from the Site to an out-of-state waste management facility only if, prior to any shipment, they provide written notice to the appropriate state environmental official in the receiving facility's state and to EPA's RPM. This notice requirement shall not apply to any off-Site shipments when the total quantity of all such shipments will not exceed ten cubic yards. The written notice must include the following information, if available: (1) the name and location of the receiving facility; (2) the type and quantity of Waste Material to be shipped; (3) the schedule for the shipment; and (4) the method of transportation. Respondent shall also notify the state environmental official referenced above and EPA's RPM of any major changes in the shipment plan, such as a decision to ship the Waste Material to a different out-of-state facility. Respondent shall provide the written notice after the award of the contract for the RI and before the Waste Material is shipped.

c. Respondent may ship Investigation Derived Waste (IDW) from the Site to an off-Site facility only if they comply with Section 121(d)(3) of CERCLA, 42 U.S.C. § 9621(d)(3), 40 C.F.R. § 300.440, EPA's "Guide to Management of Investigation Derived Waste," OSWER 9345.3-03FS (Jan. 1992), and any IDW-specific requirements contained in the SOW. Wastes shipped off-Site to a laboratory for characterization, and RCRA hazardous wastes that meet the requirements for an exemption from RCRA under 40 C.F.R. § 261.4(e) shipped off-Site for treatability studies, are not subject to 40 C.F.R. § 300.440.

32. **Meetings.** Respondent shall make presentations at, and participate in, meetings at the request of EPA during the preparation of the RI. In addition to discussion of the technical aspects of the RI, topics will include anticipated problems or new issues. Meetings will be scheduled at EPA's discretion.

33. **Progress Reports.** In addition to the deliverables set forth in this Order, Respondent shall submit written monthly progress reports to EPA by the 10th day of the following month. At a minimum, with respect to the preceding month, these progress reports shall:

- a. describe the actions that have been taken to comply with this Order;
- b. include all results of sampling and tests and all other data received by Respondent;
- c. describe Work planned for the next two months with schedules relating such Work to the overall project schedule for RI completion; and
- d. describe all problems encountered in complying with the requirements of this Order and any anticipated problems, any actual or anticipated delays, and solutions developed and implemented to address any actual or anticipated problems or delays.

## **XII. SUBMISSION AND APPROVAL OF DELIVERABLES**

### **34. Submission of Deliverables**

#### **a. General Requirements for Deliverables**

- (1) Except as otherwise provided in this Order, Respondent shall direct all submissions required by this Order to EPA's RPM, Jamie Miller, Mail Code: 8EPR, EPA Region 8, 1595 Wynkoop Street, Denver, CO 80202, 303-312-6519, miller.jamie@epa.gov, to the State at Mark Rudolph, mark.rudolph@state.co.us, and to BLM at Krista Doebller, kdoebble@blm.gov. Respondent shall submit all deliverables required by this Order, the attached SOW, or any approved work plan in accordance with the schedule set forth in such plan.
- (2) Respondent shall submit all deliverables in electronic form. Technical specifications for sampling and monitoring data and spatial data are addressed in Paragraph 34.b. All other deliverables shall be submitted in the electronic form specified by EPA's Project Coordinator. If any deliverable includes maps, drawings, or other exhibits that are larger than 8.5 x 11 inches. Respondent shall also provide paper copies of such exhibits.

#### **b. Technical Specifications for Deliverables**

- (1) Sampling and monitoring data should be submitted in standard regional Electronic Data Deliverable (EDD) format as specified in the U.S. EPA Region 8, Superfund Remedial Data Management Plan, as amended. Other delivery methods may be allowed if electronic direct submission presents a significant burden or as technology changes.
- (2) Spatial data, including spatially-referenced data and geospatial data, should be submitted: (i) as specified in the U.S. EPA Region 8, Superfund Remedial Data Management Plan, as amended; and (ii) as unprojected geographic coordinates in decimal degree format using North American Datum 1983

(NAD83) or World Geodetic System 1984 (WGS84) as the datum. If applicable, submissions should include the collection method(s). Projected coordinates may optionally be included but must be documented. Spatial data should be accompanied by metadata, and such metadata should be compliant with the Federal Geographic Data Committee (FGDC) Content Standard for Digital Geospatial Metadata and its EPA profile, the EPA Geospatial Metadata Technical Specification. An add-on metadata editor for ESRI software, the EPA Metadata Editor (EME), complies with these FGDC and EPA metadata requirements and is available at <https://edg.epa.gov/EME/>.

- (3) Each file must include an attribute name for each site unit or sub-unit submitted. Consult <https://www.epa.gov/geospatial/geospatial-policies-and-standards> for any further available guidance on attribute identification and naming.
- (4) Spatial data submitted by Respondent does not, and is not intended to, define the boundaries of the Site.

### 35. **Approval of Deliverables**

#### a. **Initial Submissions**

- (1) After review of any deliverable that is required to be submitted for EPA approval under this Order or the attached SOW, EPA shall:  
(i) approve, in whole or in part, the submission; (ii) approve the submission upon specified conditions; (iii) disapprove, in whole or in part, the submission; or (iv) any combination of the foregoing.
- (2) EPA also may modify the initial submission to cure deficiencies in the submission if: (i) EPA determines that disapproving the submission and awaiting a resubmission would cause substantial disruption to the Work; or (ii) previous submission(s) have been disapproved due to material defects and the deficiencies in the initial submission under consideration indicate a bad faith lack of effort to submit an acceptable deliverable.

b. **Resubmissions.** Upon receipt of a notice of disapproval under Paragraph 35.a(1) (Initial Submissions), or if required by a notice of approval upon specified conditions under Paragraph 35.a(1), Respondent shall, within 5 days or such longer time as specified by EPA in such notice, correct the deficiencies and resubmit the deliverable for approval. After review of the resubmitted deliverable, EPA may: (a) approve, in whole or in part, the resubmission; (b) approve the resubmission upon specified conditions; (c) modify the resubmission; (d) disapprove, in whole or in part, the resubmission, requiring Respondent to correct the deficiencies; or (e) any combination of the foregoing.

c. **Implementation.** Upon approval, approval upon conditions, or modification by EPA under Paragraph 35.a (Initial Submissions) or Paragraph 35.b (Resubmissions), of any deliverable, or any portion thereof: (i) such deliverable, or portion



thereof, will be incorporated into and enforceable under the Order; and (ii) Respondent shall take any action required by such deliverable, or portion thereof. Implementation of any non-deficient portion of a submission shall not relieve Respondent of any liability for penalties under Section XX (Enforcement/Work Takeover) for violations of this Order.

36. Notwithstanding the receipt of a notice of disapproval, Respondent shall proceed to take any action required by any non-deficient portion of the submission, unless otherwise directed by EPA.

37. In the event that EPA takes over some of the tasks, but not the preparation of the Remedial Investigation Report (RI Report), Respondent shall incorporate and integrate information supplied by EPA into those reports.

38. Respondent shall not proceed with any activities or tasks dependent on the following deliverables until receiving EPA approval, approval on condition, or modification of such deliverables: RI Work Plan; Sampling and Analysis Plan; and draft RI Report. While awaiting EPA approval, approval on condition, or modification of these deliverables, Respondent shall proceed with all other tasks and activities that may be conducted independently of these deliverables, in accordance with the schedule set forth under this Order.

39. For all remaining deliverables not listed in Paragraph 38, Respondent shall proceed with all subsequent tasks, activities, and deliverables without awaiting EPA approval of the submitted deliverable. EPA reserves the right to stop Respondent from proceeding further, either temporarily or permanently, on any task, activity, or deliverable at any point during the Work.

40. **Material Defects.** If an initially submitted or resubmitted plan, report, or other deliverable contains a material defect, and the plan, report, or other deliverable is disapproved or modified by EPA under Paragraph 35.a (Initial Submissions) or 35.b (Resubmissions) due to such material defect, Respondent shall be deemed in violation of this Order for failure to submit such plan, report, or other deliverable timely and adequately. Respondent may be subject to penalties for such violation as provided in Section XX (Enforcement/Work Takeover).

41. Neither failure of EPA to expressly approve or disapprove of Respondent's submissions within a specified time period, nor the absence of comments, shall be construed as approval by EPA.

### **XIII. QUALITY ASSURANCE, SAMPLING, AND DATA ANALYSIS**

42. Respondent shall use quality assurance, quality control, and other technical activities and chain of custody procedures for all samples consistent with "EPA Requirements for Quality Assurance Project Plans (QA/R5)," EPA/240/B-01/003, March 2001 (reissued May 2006), "Guidance for Quality Assurance Project Plans (QA/G-5)," EPA/240/R-02/009 (December 2002), and "Uniform Federal Policy for Quality Assurance Project Plans, Parts 1-3," EPA/505/B-04/900A-900C (March 2005).

#### 43. **Laboratories**

a. Respondent shall ensure that EPA, State, and BLM personnel and their authorized representatives are allowed access at reasonable times to all laboratories utilized by Respondent pursuant to this Order. In addition, Respondent shall ensure that such laboratories shall analyze all samples submitted by EPA pursuant to the Quality Assurance Project Plan (QAPP) for quality assurance, quality control, and technical activities that will satisfy the stated performance criteria as specified in the QAPP and that sampling and field activities are conducted in accordance with the Agency's "EPA QA Field Activities Procedure" CIO 2105-P-02.1 (9/23/2014), available at <https://www.epa.gov/irmpoli8/epa-qa-field-activities-procedures>. Respondent shall ensure that the laboratories they utilize for the analysis of samples taken pursuant to this Order meet the competency requirements set forth in EPA's "Policy to Assure Competency of Laboratories, Field Sampling, and Other Organizations Generating Environmental Measurement Data under Agency-Funded Acquisitions," available at <https://www.epa.gov/measurements/documents-about-measurement-competency-under-acquisition-agreements>, and that the laboratories perform all analyses using EPA-accepted methods. Accepted EPA methods consist of, but are not limited to, methods that are documented in the EPA's Contract Laboratory Program (<https://www.epa.gov/superfund/programs/clp/>), SW 846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (<https://www.epa.gov/hw-sw846>), "Standard Methods for the Examination of Water and Wastewater" (<http://www.standardmethods.org/>), and 40 C.F.R. Part 136, "Air Toxics - Monitoring Methods" (<https://www.epa.gov/ttnamti1/airtox.html>).

b. Upon approval by EPA, after a reasonable opportunity for review and comment by the State and BLM, Respondent may use other appropriate analytical methods, as long as (i) quality assurance/quality control (QA/QC) criteria are contained in the methods and the methods are included in the QAPP, (ii) the analytical methods are at least as stringent as the methods listed above, and (iii) the methods have been approved for use by a nationally recognized organization responsible for verification and publication of analytical methods, e.g., EPA, ASTM, NIOSH, OSHA, etc.

c. Respondent shall ensure that all laboratories they use for analysis of samples taken pursuant to this Order have a documented Quality System that complies with ASQ/ANSI E4:2014 "Quality Management Systems for Environmental Information and Technology Programs – Requirements With Guidance for Use" (American Society for Quality, February 2014), and "EPA Requirements for Quality Management Plans (QA/R-2)" EPA/240/B-01/002 (March 2001, reissued May 2006), or equivalent documentation as determined by EPA. EPA may consider Environmental Response Laboratory Network (ERLN) laboratories, laboratories accredited under the National Environmental Laboratory Accreditation Program (NELAP), or laboratories that meet International Standardization Organization (ISO 17025) standards or other nationally recognized programs as meeting the Quality System requirements.

d. Respondent shall ensure that all field methodologies utilized in collecting samples for subsequent analysis pursuant to this Order are conducted in accordance with the procedures set forth in the approved QAPP.

#### 44. **Sampling**

a. Upon request, Respondent shall provide split or duplicate samples to EPA, the State, and BLM or their authorized representatives. Respondent shall notify EPA, the State, and BLM not less than 14 days in advance of any sample collection activity. In addition, EPA, the State, and BLM shall have the right to take any additional samples that EPA, the State, or BLM deem necessary. Upon request, EPA, the State, and BLM shall provide to Respondent split or duplicate samples of any samples they take as part of EPA's oversight of Respondent's implementation of the Work, and any such samples shall be analyzed in accordance with the approved QAPP.

b. Respondent shall submit to EPA, the State, and BLM, in the next monthly progress report as described in Paragraph 33 (Progress Reports) the results of all sampling and/or tests or other data obtained or generated by or on behalf of Respondent with respect to the Site and/or the implementation of this Order.

### **XIV. PROPERTY REQUIREMENTS**

45. **Agreements Regarding Access and Non-Interference.** Respondent shall, with respect to any Non-Respondent Owner's Affected Property, use best efforts to secure from such Non-Respondent Owner an agreement, enforceable by Respondent and by EPA, providing that such Non-Respondent Owner, and Respondent shall, with respect to Respondent's Affected Property: (i) provide EPA, the State, and BLM, and their representatives, contractors, and subcontractors with access at all reasonable times to such Affected Property to conduct any activity regarding the Order, including those listed in Paragraph 45.a (Access Requirements); and (ii) refrain from using such Affected Property in any manner that EPA determines will interfere with or adversely affect the implementation or integrity of the Work. Respondent shall provide a copy of such access agreement(s) to EPA, the State, and BLM.

a. **Access Requirements.** The following is a list of activities for which access is required regarding the Affected Property:

- (1) Monitoring the Work;
- (2) Verifying any data or information submitted to EPA, the State, or BLM;
- (3) Conducting investigations regarding contamination at or near the Site;
- (4) Obtaining samples;
- (5) Assessing the need for, planning, implementing, or monitoring response actions;
- (6) Assessing implementation of quality assurance and quality control practices as defined in the approved QAPP;

- (7) Implementing the Work pursuant to the conditions set forth in Paragraph 65 (Work Takeover);
- (8) Inspecting and copying records, operating logs, contracts, or other documents maintained or generated by Respondent or their agents, consistent with Section XV (Access to Information);
- (9) Assessing Respondent's compliance with the Order;
- (10) Determining whether the Affected Property is being used in a manner that is prohibited or restricted, or that may need to be prohibited or restricted under the Order; and
- (11) Implementing, monitoring, maintaining, reporting on, and enforcing any land, water, or other resource use restrictions regarding the Affected Property.

46. **Best Efforts.** As used in this Section, "best efforts" means the efforts that a reasonable person in the position of Respondent would use so as to achieve the goal in a timely manner, including the cost of employing professional assistance and the payment of reasonable sums of money to secure access and/or use restriction agreements, as required by this Section. If Respondent is unable to accomplish what is required through "best efforts," they shall notify EPA, and include a description of the steps taken to comply with the requirements. If EPA deems it appropriate, it may assist Respondent, or take independent action, in obtaining such access. EPA reserves the right to seek payment from Respondent for all costs, including cost of attorneys' time, incurred by the United States in obtaining such access.

47. In the event of any Transfer of the Affected Property, unless EPA otherwise consents in writing, Respondent shall continue to comply with their obligations under the Order, including their obligation to secure access regarding the Affected Property.

48. Notwithstanding any provision of this Order, EPA, the State, and BLM retain all of their access authorities and rights, as well as all of their rights to require land, water, or other resource use restrictions, including enforcement authorities related thereto, under CERCLA, RCRA, and any other applicable statute or regulations.

## **XV. ACCESS TO INFORMATION**

49. Respondent shall provide to EPA, the State, and BLM, upon request, copies of all records, reports, documents, and other information (including records, reports, documents, and other information in electronic form) (hereinafter referred to as Records) within Respondent's possession or control or that of their contractors or agents relating to activities at the Site or to the implementation of this Order, including, but not limited to, sampling, analysis, chain of custody records, manifests, trucking logs, receipts, reports, sample traffic routing, correspondence, or other documents or information regarding the Work. Respondent shall also make available to EPA, the State, and BLM, for purposes of investigation, information gathering, or testimony, their employees, agents, or representatives with knowledge of relevant facts concerning the performance of the Work.

## **50. Privileged and Protected Claims**

a. Respondent may assert that all or part of a Record requested by EPA, the State, or BLM is privileged or protected as provided under federal law, in lieu of providing the Record, provided Respondent complies with Paragraph 50.b, and except as provided in Paragraph 50.b.

b. If Respondent asserts a claim of privilege or protection, they shall provide EPA, the State, and BLM with the following information regarding such Record: its title; its date; the name, title, affiliation (e.g., company or firm), and address of the author, of each addressee, and of each recipient; a description of the Record's contents; and the privilege or protection asserted. If a claim of privilege or protection applies only to a portion of a Record, Respondent shall provide the Record to EPA, the State, and BLM in redacted form to mask the privileged or protected portion only. Respondent shall retain all Records that they claim to be privileged or protected until EPA, the State, and BLM or a court determines that such Record is privileged or protected.

c. Respondent may make no claim of privilege or protection regarding: (1) any data regarding the Site, including, but not limited to, all sampling, analytical, monitoring, hydrogeologic, scientific, chemical, radiological, or engineering data, or the portion of any other Record that evidences conditions at or around the Site; or (2) the portion of any Record that Respondent is required to create or generate pursuant to this Order.

**51. Business Confidential Claims.** Respondent may assert that all or part of a Record provided to EPA, the State, and BLM under this Section or Section XVI (Record Retention) is business confidential to the extent permitted by and in accordance with Section 104(e)(7) of CERCLA, 42 U.S.C. § 9604(e)(7), and 40 C.F.R. § 2.203(b). Respondent shall segregate and clearly identify all Records or parts thereof submitted under this Order for which Respondent asserts business confidentiality claims. Records claimed as confidential business information will be afforded the protection specified in 40 C.F.R. Part 2, Subpart B. If no claim of confidentiality accompanies Records when they are submitted to EPA, the State, and BLM, or if EPA has notified Respondent that the Records are not confidential under the standards of Section 104(e)(7) of CERCLA or 40 C.F.R. Part 2, Subpart B, the public may be given access to such Records without further notice to Respondent.

**52.** Notwithstanding any provision of this Order, EPA, the State, and BLM retain all of their information gathering and inspection authorities and rights, including enforcement actions related thereto, under CERCLA, RCRA, and any other applicable statutes or regulations.

## **XVI. RECORD RETENTION**

**53.** During the pendency of this Order and for a minimum of 10 years after Respondent's receipt of EPA's notification pursuant to Section XXVII (Notice of Completion of Work), Respondent shall preserve and retain all non-identical copies of Records (including Records in electronic form) now in its possession or control, or that come into its possession or control, that relate in any manner to its liability under CERCLA with respect to the Site, provided, however, that Respondent who is potentially liable as an owner or operator of the Site must retain, in addition, all Records that relate to the liability of any other person under

CERCLA with respect to the Site. Respondent must also retain, and instruct its contractors and agents to preserve, for the same period of time specified above, all non-identical copies of the last draft or final version of any Records (including Records in electronic form) now in its possession or control or that come into its possession or control that relate in any manner to the performance of the Work, provided, however, that Respondent (and its contractors and agents) must retain, in addition, copies of all data generated during performance of the Work and not contained in the aforementioned Records required to be retained. Each of the above record retention requirements shall apply regardless of any corporate retention policy to the contrary.

54. At the conclusion of this document retention period, Respondent shall notify EPA, the State, and BLM at least 90 days prior to the destruction of any such Records, and, upon request by EPA, the State, or BLM, and except as provided in Paragraph 50 (Privileged and Protected Claims), Respondent shall deliver any such Records to EPA, the State, or BLM.

55. Within 30 days after the Effective Date, Respondent shall submit a written certification to EPA's Project Coordinator that, to the best of its knowledge and belief, after thorough inquiry, it has not altered, mutilated, discarded, destroyed, or otherwise disposed of any Records (other than identical copies) relating to its potential liability regarding the Site since notification by the United States or the State, and that it has fully complied with any and all EPA, BLM, and State requests for information regarding the Site pursuant to Sections 104(e) and 122(e) of CERCLA, 42 U.S.C. §§ 9604(e) and 9622(e), and Section 3007 of RCRA, 42 U.S.C. § 6927, and state law. If Respondent is unable to so certify, Respondent shall submit a modified certification that explains in detail why it is unable to certify in full with regard to all Records.

## **XVII. COMPLIANCE WITH OTHER LAWS**

56. Nothing in this Order limits Respondent's obligations to comply with the requirements of all applicable state and federal laws and regulations, except as provided in Section 121(e) of CERCLA, 42 U.S.C. § 9621(e), and 40 C.F.R. §§ 300.400(e) and 300.415(j). In accordance with 40 C.F.R. § 300.415(j), all on-site actions required pursuant to this Order shall, to the extent practicable, as determined by EPA, considering the exigencies of the situation, attain applicable or relevant and appropriate requirements (ARARs) under federal environmental or state environmental or facility siting laws.

57. No local, state, or federal permit shall be required for any portion of the Work conducted entirely on-site (i.e., within the areal extent of contamination or in very close proximity to the contamination and necessary for implementation of the Work), including studies, if the action is selected and carried out in compliance with Section 121 of CERCLA, 42 U.S.C. § 9621. Where any portion of the Work that is not on-site requires a federal or state permit or approval, Respondent shall submit timely and complete applications and take all other actions necessary to obtain and to comply with all such permits or approvals. This Order is not, and shall not be construed to be, a permit issued pursuant to any federal or state statute or regulation.

## **XVIII. EMERGENCY RESPONSE AND NOTIFICATION OF RELEASES**

58. **Emergency Response.** If any event occurs during performance of the Work that causes or threatens to cause a release of Waste Material on, at, or from the Site that either

constitutes an emergency situation or that may present an immediate threat to public health or welfare or the environment, Respondent shall immediately take all appropriate action to prevent, abate, or minimize such release or threat of release. Respondent shall take these actions in accordance with all applicable provisions of this Order, including, but not limited to, the Health and Safety Plan. Respondent shall also immediately notify EPA's Project Coordinator or, in the event of his/her unavailability, the Regional Duty Officer at 303-312-6510 of the incident or Site conditions. In the event that Respondent fails to take appropriate response action as required by this Paragraph, and EPA takes such action instead, EPA reserves the right to pursue cost recovery.

59. **Release Reporting.** Upon the occurrence of any event during performance of the Work that Respondent is required to report pursuant to Section 103 of CERCLA, 42 U.S.C. § 9603, or Section 304 of the Emergency Planning and Community Right-To-Know Act (EPCRA), 42 U.S.C. § 11004, Respondent shall immediately orally notify EPA's Project Coordinator, or, in the event of his/her unavailability, the Regional Duty Officer at 303-312-6510 and the National Response Center at (800) 424-8802. This reporting requirement is in addition to, and not in lieu of, reporting under Section 103 of CERCLA, 42 U.S.C. § 9603, and Section 304 of the Emergency Planning and Community Right-To-Know Act of 1986, 42 U.S.C. § 11004.

60. For any event covered under this Section, Respondent shall submit a written report to EPA within 7 days after the onset of such event, setting forth the action or event that occurred and the measures taken, and to be taken, to mitigate any release or threat of release or endangerment caused or threatened by the release and to prevent the reoccurrence of such a release or threat of release.

## **XIX. PAYMENT OF RESPONSE COSTS**

61. Upon EPA's written demand, Respondent shall pay EPA all Response Costs incurred or to be incurred in connection with this Order. On a periodic basis, EPA will send Respondent a bill requiring payment of all Response Costs incurred by the United States with respect to this Order that includes a SCORPIOS Report, which includes direct and indirect costs incurred by EPA, its contractors, and the Department of Justice.

62. Respondent shall make all payments within 30 days after receipt of each written demand requiring payment. Payment shall be made to EPA by Fedwire Electronic Funds Transfer (EFT) to:

Federal Reserve Bank of New York  
ABA = 021030004  
Account = 68010727  
SWIFT address = FRNYUS33  
33 Liberty Street  
New York NY 10045  
Field Tag 4200 of the Fedwire message should read "D 68010727 Environmental Protection Agency"

and shall reference Site/Spill ID Number A8-M5 and the EPA docket number for this action.

**For ACH payment:**

Respondent shall make payment to EPA by Automated Clearinghouse (ACH) to:

500 Rivertech Court  
Riverdale, Maryland 20737  
Contact – John Schmid 202-874-7026 or REX, 1-866-234-5681  
ABA = 051036706  
Transaction Code 22 - checking  
Environmental Protection Agency  
Account 310006  
CTX Format

and shall reference Site/Spill ID Number A8-M5 and the EPA docket number for this action.

**For online payment:**

Respondent shall make payment at <https://www.pay.gov> to the U.S. EPA account in accordance with instructions to be provided to Respondent by EPA.

63. At the time of payment, Respondent shall send notice that payment has been made to EPA's RPM, to Mike Rudy, Enforcement Specialist, U.S.EPA Region 8, Mailcode ENF-RC, 1595 Wynkoop, Denver, CO 80202-1129, and to the EPA Cincinnati Finance Office by email at [cinwd\\_acctsreceivable@epa.gov](mailto:cinwd_acctsreceivable@epa.gov), or by mail to

EPA Cincinnati Finance Office  
26 W. Martin Luther King Drive  
Cincinnati, Ohio 45268

Such notice shall reference Site/Spill ID Number A8-M5 and the EPA docket number for this action.

64. In the event that the payments for Response Costs are not made within 30 days after Respondent's receipt of a written demand requiring payment, Respondent shall pay Interest on the unpaid balance. The Interest on Response Costs shall begin to accrue on the date of the written demand and shall continue to accrue until the date of payment. Payments of Interest made under this Paragraph shall be in addition to such other remedies or sanctions available to the United States by virtue of Respondent's failure to make timely payments under this Section. Respondent shall make all payments required by this Paragraph in the manner described in Paragraphs 62 and 63.

**XX. ENFORCEMENT/WORK TAKEOVER**

65. Any willful violation, or failure or refusal to comply with any provision of this Order may subject Respondent to civil penalties of up to \$55,907 per violation per day, as provided in Section 106(b)(1) of CERCLA, 42 U.S.C. § 9606(b)(1), and the Civil Monetary Penalty Inflation Adjustment Rule, 81 Fed. Reg. 43,091, 40 C.F.R. Part 19.4. In the event of such willful violation, or failure or refusal to comply, EPA may carry out the required actions



unilaterally, pursuant to Section 104 of CERCLA, 42 U.S.C. § 9604, and/or may seek judicial enforcement of this Order pursuant to Section 106 of CERCLA, 42 U.S.C. § 9606. In addition, nothing in this Order shall limit EPA's authority under Section XXIV (Financial Assurance). Respondent may also be subject to punitive damages in an amount up to three times the amount of any costs incurred by the United States as a result of such failure to comply, as provided in Section 107(c)(3) of CERCLA, 42 U.S.C. § 9607(c)(3).

## **XXI. RESERVATIONS OF RIGHTS BY THE UNITED STATES**

66. Nothing in this Order shall limit the power and authority of EPA or the United States to take, direct, or order all actions necessary to protect public health, welfare, or the environment or to prevent, abate, or minimize an actual or threatened release of hazardous substances, pollutants, or contaminants, or hazardous or solid waste on, at, or from the Site. Further, nothing in this Order shall prevent EPA or the United States from seeking legal or equitable relief to enforce the terms of this Order, from taking other legal or equitable action as it deems appropriate and necessary, or from requiring Respondent in the future to perform additional activities pursuant to CERCLA or any other applicable law. EPA and the United States reserve the right to bring an action against Respondent under Section 107 of CERCLA, 42 U.S.C. § 9607, for recovery of any response costs incurred by the United States related to this Order or the Site and not paid by Respondent.

## **XXII. OTHER CLAIMS**

67. By issuance of this Order, the United States and EPA assume no liability for injuries or damages to persons or property resulting from any acts or omissions of Respondent. The United States or EPA shall not be deemed a party to any contract entered into by Respondent or their directors, officers, employees, agents, successors, representatives, assigns, contractors, or consultants in carrying out actions pursuant to this Order.

68. Nothing in this Order constitutes a satisfaction of or release from any claim or cause of action against Respondent or any person not a party to this Order, for any liability such person may have under CERCLA, other statutes, or common law, including but not limited to any claims of the United States under Sections 106 and 107 of CERCLA, 42 U.S.C. §§ 9606 and 9607.

69. Nothing in this Order shall be deemed to constitute preauthorization of a claim within the meaning of Section 111(a)(2) of CERCLA, 42 U.S.C. § 9611(a)(2), or 40 C.F.R. § 300.700(d).

70. No action or decision by EPA pursuant to this Order shall give rise to any right to judicial review, except as set forth in Section 113(h) of CERCLA, 42 U.S.C. § 9613(h).

## **XXIII. INSURANCE**

71. No later than 10 days before commencing any on-site Work, Respondent shall secure, and shall maintain for the duration of this Order, commercial general liability insurance with limits of liability of \$1 million per occurrence, automobile liability insurance with limits of liability of \$1 million per accident, and umbrella liability insurance with limits of liability of

\$5 million in excess of the required commercial general liability and automobile liability limits, naming EPA as an additional insured with respect to all liability arising out of the activities performed by or on behalf of Respondent pursuant to this Order. Within the same time period, Respondent shall provide EPA with certificates of such insurance and a copy of each insurance policy. Respondent shall submit such certificates and copies of policies each year on the anniversary of the Effective Date. In addition, for the duration of the Order, Respondent shall satisfy, or shall ensure that their contractors or subcontractors satisfy, all applicable laws and regulations regarding the provision of worker's compensation insurance for all persons performing Work on behalf of Respondent in furtherance of this Order. If Respondent demonstrates by evidence satisfactory to EPA that any contractor or subcontractor maintains insurance equivalent to that described above, or insurance covering some or all of the same risks but in a lesser amount, then, with respect to that contractor or subcontractor, Respondent need provide only that portion of the insurance described above that is not maintained by the contractor or subcontractor. Respondent shall ensure that all submittals to EPA under this Paragraph identify the Site, county, state, and the EPA docket number for this action.

#### **XXIV. FINANCIAL ASSURANCE**

72. In order to ensure completion of the Work, Respondent shall secure financial assurance, initially in the amount of \$5,000,000.00 (Estimated Cost of the Work). The financial assurance must be one or more of the mechanisms listed below, in a form substantially identical to the relevant sample documents available from EPA or under the "Financial Assurance - Orders" category on the Cleanup Enforcement Model Language and Sample Documents Database at <https://cfpub.epa.gov/compliance/models/>, and satisfactory to EPA. Respondent may use multiple mechanisms if they are limited to trust funds, surety bonds guaranteeing payment, and/or letters of credit.

a. A trust fund: (1) established to ensure that funds will be available as and when needed for performance of the Work; (2) administered by a trustee that has the authority to act as a trustee and whose trust operations are regulated and examined by a federal or state agency; and (3) governed by an agreement that requires the trustee to make payments from the fund only when the Assistant Regional Administrator Office of Ecosystems, Protection and Remediation advises the trustee in writing that: (i) payments are necessary to fulfill the Respondent's obligations under the Order; or (ii) funds held in trust are in excess of the funds that are necessary to complete the performance of Work in accordance with this Order;

b. A surety bond, issued by a surety company among those listed as acceptable sureties on federal bonds as set forth in Circular 570 of the U.S. Department of the Treasury, guaranteeing payment or performance in accordance with Paragraph 78 (Access to Financial Assurance);

c. An irrevocable letter of credit, issued by an entity that has the authority to issue letters of credit and whose letter-of-credit operations are regulated and examined by a federal or state agency, guaranteeing payment in accordance with Paragraph 78 (Access to Financial Assurance);

d. A demonstration by a Respondent that it meets the relevant financial test criteria of Paragraph 75; or

e. A guarantee to fund or perform the Work executed by a company (1) that is a direct or indirect parent company of a Respondent or has a “substantial business relationship” (as defined in 40 C.F.R. § 264.141(h)) with a Respondent; and (2) can demonstrate to EPA’s satisfaction that it meets the financial test criteria of Paragraph 75.

73. **Standby Trust.** If Respondent seeks to establish financial assurance by using a surety bond, a letter of credit, or a corporate guarantee, Respondent shall at the same time establish and thereafter maintain a standby trust fund, which must meet the requirements specified in Paragraph 72.a, and into which payments from the other financial assurance mechanism can be deposited if the financial assurance provider is directed to do so by EPA pursuant to Paragraph 78 (Access to Financial Assurance). An originally signed duplicate of the standby trust agreement must be submitted, with the other financial mechanism, to EPA in accordance with Paragraph 74. Until the standby trust fund is funded pursuant to Paragraph 78 (Access to Financial Assurance), neither payments into the standby trust fund nor annual valuations are required.

74. Within 30 days after the Effective Date, Respondent shall submit to EPA proposed financial assurance mechanisms in draft form in accordance with Paragraph 72 for EPA’s review. Within 60 days after the Effective Date, or 30 days after EPA’s approval of the form and substance of Respondent’s financial assurance, whichever is later, Respondent shall secure all executed and/or otherwise finalized mechanisms or other documents consistent with the EPA-approved form of financial assurance and shall submit such mechanisms and documents to CERCLA Financial Assurance, Mail Code: 8ENFRC, EPA Region 8, 1595 Wynkoop Street, Denver, CO 80202.

75. If Respondent seeks to provide financial assurance by means of a demonstration or guarantee under Paragraph 72.d or 72.e Respondent must, within 30 days after the Effective Date:

a. Demonstrate that:

(1) Respondent or guarantor has:

- i. Two of the following three ratios: a ratio of total liabilities to net worth less than 2.0; a ratio of the sum of net income plus depreciation, depletion, and amortization to total liabilities greater than 0.1; and a ratio of current assets to current liabilities greater than 1.5; and
- ii. Net working capital and tangible net worth each at least six times the sum of the Estimated Cost of the Work and the amounts, if any, of other federal, state, or tribal environmental obligations financially assured through the use of a financial test or guarantee; and

- iii. Tangible net worth of at least \$10 million; and
- iv. Assets located in the United States amounting to at least 90 percent of total assets or at least six times the sum of the Estimated Cost of the Work and the amounts, if any, of other federal, state, or tribal environmental obligations financially assured through the use of a financial test or guarantee; or

(2) Respondent or guarantor has:

- i. A current rating for its senior unsecured debt of AAA, AA, A, or BBB as issued by Standard and Poor's or Aaa, Aa, A or Baa as issued by Moody's; and
- ii. Tangible net worth at least six times the sum of the Estimated Cost of the Work and the amounts, if any, of other federal, state, or tribal environmental obligations financially assured through the use of a financial test or guarantee; and
- iii. Tangible net worth of at least \$10 million; and
- iv. Assets located in the United States amounting to at least 90 percent of total assets or at least six times the sum of the Estimated Cost of the Work and the amounts, if any, of other federal, state, or tribal environmental obligations financially assured through the use of a financial test or guarantee; and

b. Submit to EPA for the Respondent or guarantor: (1) a copy of an audited independent certified public accountant's report of the entity's financial statements for the latest completed fiscal year, which must not express an adverse opinion or disclaimer of opinion; and (2) a letter from its chief financial officer and a report from an independent certified public accountant substantially identical to the sample letter and reports available from EPA or under the "Financial Assurance – Orders" subject list category on the Cleanup Enforcement Model Language and Sample Documents Database at <https://cfpub.epa.gov/compliance/models/>.

76. If Respondent provides financial assurance by means of a demonstration or guarantee under Paragraph 72.d or 72.e Respondent must also:

a. Annually resubmit the documents described in Paragraph 75.b within 90 days after the close of Respondent's or guarantor's fiscal year;

b. Notify EPA within 30 days after Respondent or guarantor determines that it no longer satisfies the relevant financial test criteria and requirements set forth in this Section; and

c. Provide to EPA, within 30 days of EPA's request, reports of the financial condition of the Respondent or guarantor in addition to those specified in Paragraph 75.b; EPA may make such a request at any time based on a belief that the Respondent or guarantor may no longer meet the financial test requirements of this Section.

77. Respondent shall diligently monitor the adequacy of the financial assurance. If Respondent becomes aware of any information indicating that the financial assurance provided under this Section is inadequate or otherwise no longer satisfies the requirements of this Section, such Respondent shall notify EPA of such information within 30 days. If EPA determines that the financial assurance provided under this Section is inadequate or otherwise no longer satisfies the requirements of this Section, EPA will notify the Respondent of such determination. Respondent shall, within 30 days after notifying EPA or receiving notice from EPA under this Paragraph, secure and submit to EPA for approval a proposal for a revised or alternative financial assurance mechanism that satisfies the requirements of this Section. Respondent shall follow the procedures of Paragraph 79 in seeking approval of, and submitting documentation for, the revised or alternative financial assurance mechanism. Respondent's inability to secure financial assurance in accordance with this Section does not excuse performance of any other obligation under this Order.

**78. Access to Financial Assurance**

a. If EPA determines that Respondent (1) has ceased implementation of any portion of the Work, (2) is seriously or repeatedly deficient or late in its performance of the Work, or (3) is implementing the Work in a manner that may cause an endangerment to human health or the environment, EPA may issue a written notice (Performance Failure Notice) to Respondent and the financial assurance provider regarding the Respondent's failure to perform. Any Performance Failure Notice issued by EPA will specify the grounds upon which such notice was issued and will provide Respondent a period of 10 days within which to remedy the circumstances giving rise to EPA's issuance of such notice. If, after expiration of the 10-day period specified in this Paragraph, Respondent has not remedied to EPA's satisfaction the circumstances giving rise to EPA's issuance of the relevant Performance Failure Notice, then, in accordance with any applicable financial assurance mechanism, EPA may at any time thereafter direct the financial assurance provider to immediately: (i) deposit any funds assured pursuant to this Section into the standby trust fund; or (ii) arrange for performance of the Work in accordance with this Order.

b. If EPA is notified by the provider of a financial assurance mechanism that it intends to cancel the mechanism, and the Respondent fails to provide an alternative financial assurance mechanism in accordance with this Section at least 30 days prior to the cancellation date, EPA may, prior to cancellation, direct the financial assurance provider to deposit any funds guaranteed under such mechanism into the standby trust fund for use consistent with this Section.

79. **Modification of Amount, Form, or Terms of Financial Assurance.** Respondent may submit, on any anniversary of the Effective Date or following Respondent's request for, and EPA's approval of, another date, a request to reduce the amount, or change the form or terms, of the financial assurance mechanism. Any such request must be submitted to the EPA individual(s)

referenced in Paragraph 74, and must include an estimate of the cost of the remaining Work, an explanation of the bases for the cost calculation, a description of the proposed changes, if any, to the form or terms of the financial assurance, and any newly proposed financial assurance documentation in accordance with the requirements of Paragraphs 72 and 73 (Standby Trust). EPA will notify Respondent of its decision to approve or disapprove a requested reduction or change. Respondent may reduce the amount or change the form or terms of the financial assurance mechanism only in accordance with EPA's approval. Within 30 days after receipt of EPA's approval of the requested modifications pursuant to this Paragraph, Respondent shall submit to the EPA individual(s) referenced in Paragraph 74 all executed and/or otherwise finalized documentation relating to the amended, reduced, or alternative financial assurance mechanism. Upon EPA's approval, the Estimated Cost of the Work shall be deemed to be the estimate of the cost of the remaining Work in the approved proposal.

80. **Release, Cancellation, or Discontinuation of Financial Assurance.** Respondent may release, cancel, or discontinue any financial assurance provided under this Section only: (a) after receipt of documentation issued by EPA certifying completion of the Work; or (b) in accordance with EPA's written approval of such release, cancellation, or discontinuation.

## **XXV. MODIFICATION**

81. The EPA Project Coordinator may modify any plan or schedule or the SOW in writing or by oral direction. Any oral modification will be memorialized in writing by EPA within 10 days, but shall have as its effective date the date of EPA's Project Coordinator's oral direction. Any other requirements of this Order may be modified in writing by signature of the designees of EPA Region 8.

82. If Respondent seeks permission to deviate from any approved Work Plan or schedule or the SOW, Respondent's Project Coordinator shall submit a written request to EPA for approval outlining the proposed modification and its basis. Respondent may not proceed with the requested deviation until receiving approval from the EPA Project Coordinator pursuant to Paragraph 81.

83. No informal advice, guidance, suggestion, or comment by EPA's Project Coordinator or other EPA representatives regarding any deliverables submitted by Respondent shall relieve Respondent of its obligation to obtain any formal approval required by this Order, or to comply with all requirements of this Order, unless it is formally modified.

## **XXVI. DELAY IN PERFORMANCE**

84. Respondent shall notify EPA of any delay or anticipated delay in performing any requirement of this Order. Such notification shall be made by telephone and email to the EPA Project Coordinator within 48 hours after Respondent first knew or should have known that a delay might occur. Respondent shall adopt all reasonable measures to avoid or minimize any such delay. Within 7 days after notifying EPA by telephone and email, Respondent shall provide to EPA written notification fully describing the nature of the delay, the anticipated duration of the delay, any justification for the delay, all actions taken or to be taken to prevent or minimize the delay or the effect of the delay, a schedule for implementation of any measures to be taken to mitigate the effect of the delay, and any reason why Respondent should not be held strictly

accountable for failing to comply with any relevant requirements of this Order. Increased costs or expenses associated with implementation of the activities called for in this Order is not a justification for any delay in performance.

85. Any delay in performance of this Order that, in EPA's judgment, is not properly justified by Respondent under the terms of Paragraph 84 shall be considered a violation of this Order. Any delay in performance of this Order shall not affect Respondent's obligations to fully perform all obligations under the terms and conditions of this Order.

## **XXVII. NOTICE OF COMPLETION OF WORK**

86. When EPA determines that all Work has been fully performed in accordance with this Order, with the exception of any continuing obligations required by this Order, including Payment of Response Costs, and Record Retention, EPA will provide written notice to Respondent. If EPA determines that any Work has not been completed in accordance with this Order, EPA will notify Respondent, provide a list of the deficiencies, and require that Respondent modify the RI Work Plan, if appropriate, in order to correct such deficiencies within 10 days after receipt of the EPA notice. The modified RI Work Plan shall include a schedule for correcting such deficiencies. Within 30 days after receipt of written approval of the modified RI Work Plan, Respondent shall implement the modified and approved RI Work Plan and shall submit a modified draft RI Report in accordance with the EPA notice. Failure by Respondent to implement the approved modified RI Work Plan shall be a violation of this Order.

## **XXVIII. ADMINISTRATIVE RECORD**


87. EPA has established an administrative record that contains the documents that form the basis for the issuance of this Order. The administrative record may be reviewed upon request.

88. EPA will determine the contents of the administrative record file for selection of the remedial action. Respondent shall submit to EPA documents developed during the course of the RI upon which selection of the remedial action may be based. Upon request of EPA, Respondent shall provide copies of plans, task memoranda for further action, quality assurance memoranda and audits, raw data, field notes, laboratory analytical reports, and other reports. Upon request of EPA, Respondent shall additionally submit any previous studies conducted under state, local, or other federal authorities that may relate to selection of the remedial action, and all communications between Respondent and state, local, or other federal authorities concerning selection of the remedial action.

## **XXIX. SEVERABILITY**

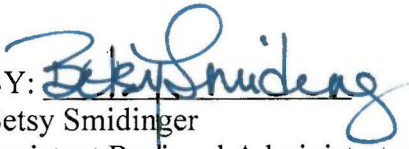
89. If a court issues an order that invalidates any provision of this Order or finds that Respondent has sufficient cause not to comply with one or more provisions of this Order, Respondent shall remain bound to comply with all provisions of this Order not invalidated or determined to be subject to a sufficient cause defense by the court's order.

It is so ORDERED.

BY:   
Suzanne J. Eohan,  
Assistant Regional Administrator  
Office of Enforcement, Compliance  
and Environmental Justice

DATE: 3/15/18

AND

BY:   
Betsy Smidinger  
Assistant Regional Administrator  
Office of Ecosystems, Protection  
and Remediation

DATE: 3/15/18



# **Appendix A to Unilateral Administrative Order for Remedial Investigation**

**Statement of Work  
for Remedial Investigation  
Bonita Peak Groundwater System**

**Bonita Peak Mining District Superfund Site, Operable Unit 3  
San Juan County, Colorado**

March 15, 2018

**1.0 INTRODUCTION**

The purpose of the remedial investigation (RI) for the Bonita Peak Groundwater System (BPGS) of the Bonita Peak Mining District Superfund Site (Site) is to characterize groundwater and other media that have the potential to contaminate surface water within, at and near the former Sunnyside mine area. It is anticipated that the RI will be conducted as an iterative process using adaptive management principles. The adaptive management strategy being employed by EPA at the Site will allow EPA to tailor the investigation approach and look for opportunities for early or interim response actions as information and data is developed during the RI. This has been designated as Operable Unit 3 (OU3) of the Site. OU3 is described in the 2018 Unilateral Administrative Order for Remedial Investigation of the Bonita Peak Groundwater System (2018 Administrative Order) issued to Sunnyside Gold Corporation (Respondent) as follows:

The Bonita Peak Groundwater System, or OU 3, generally includes the saturated and unsaturated workings of the Sunnyside Mine, associated drainage and haulage tunnels, nearby mines not known to be connected to the Sunnyside Mine by workings (e.g. Red & Bonita Mine and Gold King Mine), and the surrounding geographic area that may be hydraulically connected or influenced by current and/or historical releases from or management of these mines.

**2.0 PURPOSE OF THE STATEMENT OF WORK**

This Statement of Work (SOW) sets forth requirements for conducting an RI at OU3. The Respondent shall conduct the RI in accordance with this SOW and the requirements in the 2018 Administrative Order, and consistent with the National Contingency Plan (NCP) (40 CFR Part 300) and “Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA” (OSWER Directive No. 9355.3-01, Oct. 1988) and any other guidance documents that EPA identifies as relevant to any aspect of conducting an RI for OU3. A list of the primary guidance documents is included as Attachment A to this SOW.

As specified in Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 104(a)(1), as amended by the Superfund Amendments and Reauthorization Act (SARA), EPA will oversee the Respondent's activities throughout the RI. The Respondent shall support EPA's initiation and conduct of oversight activities. EPA's determinations, approvals, and activities as provided for in the 2018 Administrative Order, this SOW, CERCLA, the NCP, and applicable guidance will be conducted in consultation with the State of Colorado (State), specifically, the Colorado Department of Public Health and Environment (CDPHE), and U.S. Bureau of Land Management (BLM), which has jurisdiction over public land located within OU3, as provided for in the 2018 Administrative Order, and by CERCLA, the NCP, and applicable guidance. Respondent shall provide copies of all deliverables and any other documents required to be submitted to EPA under the terms of this SOW to CDPHE and BLM simultaneously with submitting them to EPA. In particular, any documents or actions involving BLM-administered lands will be reviewed by BLM and EPA will consult with BLM. EPA is responsible for making final approvals, disapprovals, or requests for modification of all deliverables submitted pursuant to this SOW.

Work described in this SOW by the Respondent and EPA's review and approval of documents and activities described in this SOW shall be performed in accordance with the procedures described in the 2018 Administrative Order. The Respondent shall furnish all necessary personnel, materials, and services needed or incidental to, performing the Work described in this SOW.

### **3.0 SCOPING AND INITIAL PLANNING FOR THE REMEDIAL INVESTIGATION**

A variety of existing reports that summarize sampling activities carried out during prior investigations of the geographic area identified as OU3 have been prepared and/or reviewed by EPA, CDPHE, BLM, the Respondent, and others. Based on this available information, EPA anticipates multiple phases of RI for OU3 including some or all of the following:

- project scoping;
- well installation and monitoring;
- other media sampling and analysis;
- hydrologic evaluations;
- mining influenced water (MIW) release prevention and contingency planning;
- geophysical investigations;
- workings, portals and bulkhead integrity assessments; and/or
- modeling.

EPA will determine the number of phases necessary to complete the RI and the activities included in each phase, subject to the provisions of the 2018 Administrative Order.

### **3.1 Assemble Existing Information**

The Respondent shall assemble existing information relevant to the RI for OU3 including, but not limited to:

- all documentation and reporting of historical operations activities and studies concerning the former mine and appurtenances and contaminants associated therewith pertinent to environmental impacts;
- all mine reclamation plans and reports;
- all environmental sampling and analysis plans;
- all environmental and other data, maps, and photos;
- all reclamation designs and results of reclamation design investigations;
- all as-built plans of reclamation work previously conducted;
- all inspection and maintenance reports of reclamation work previously conducted; and
- all reports describing data summaries, data evaluations; or interpretations of data.

This shall include available data relating to the types and quantities of hazardous substances, pollutants, or contaminants within OU3 and past material management and disposal practices at the Sunnyside Mine and other facilities within OU3.

The Respondent shall provide the information to EPA, with copies to CDPHE and BLM, in accordance with the schedule contained in Section 6 of this SOW.

### **3.2 Field Visit**

The Respondent and EPA shall determine if a field visit is required during the project scoping phase. If required, the purpose of the field visit is to assist in developing a conceptual understanding of sources and areas of contamination as well as potential exposure pathways and receptors at OU3. The Respondent shall invite EPA, State of Colorado, and BLM to participate in the field visit and shall provide notice at least two weeks in advance (or more) of the proposed date. EPA may invite other interested agencies (e.g., Colorado Division of Mining and Safety, US. Fish and Wildlife Service, etc.) or interested non-agency stakeholders to participate in the field visit.

### **3.3 Remedial Investigation Work Plan**

The Respondent shall develop a remedial investigation work plan (RI WP) for review and approval by EPA with copies to CDPHE and BLM. The RI WP will generally include the information gathered in Sections 3.1 and 3.2 of this SOW along with a general plan for conducting the RI. It is anticipated that the RI will be conducted as an iterative process using adaptive management principles and the scope of future phases (if any) is to be developed as site investigation progresses. The RI WP may be amended as needed.

The objectives of the RI are to:

1. Develop monitoring capability for water impounded by bulkheads throughout the lifespan of the bulkheads. Monitoring of water quality and water levels is required;
2. Determine the hydraulic and hydrologic connectiveness of the Sunnyside Mine workings with other mine workings and drainage tunnels, aquifers, fractured rock, and surface water;
3. Determine the nature and extent of mining related contaminants in groundwater and other media within OU3.
4. Evaluate the fate and transport of mining related contaminants in groundwater within OU3 and its effects on the surface water system;

EPA has developed a site-wide quality assurance project plan (QAPP) for the Site governing the data quality aspects of the RI. The RI shall be conducted consistent with the requirements of the site-wide QAPP. Following approval of the RI WP, the Respondent shall submit a Field Sampling Plan (FSP) in accordance with the most current version of the existing BPMD site-wide QAPP for initial investigation activities to be conducted as Phase 1. Additional information regarding FSP development is included in Section 5.

The largest data gaps involve impounded groundwater and groundwater conditions throughout OU3; however, related media also need to be investigated for impacts to human health and the environment. Related media includes any mining-derived solids, semi-solids, or liquids that can cause a release of contaminants to groundwater and/or surface water. Examples of related media include mine waste (e.g., waste rock, tailings, stockpiles, etc.), mineralized mine workings (e.g., tunnels, stopes, winzes, adits, high walls, etc.), mining influenced water (e.g., pore water, adit discharge), and contaminated sediment or soil.

Phase 1 shall include at a minimum:

- installation, development, and sampling of at least 1 monitoring well to evaluate groundwater conditions between bulkhead 2 and bulkhead 3 of the American Tunnel. An assessment of water levels in the American Tunnel between bulkhead 1 and bulkhead 2 shall be performed. If the existing well (NFPZ-1) is insufficient to meet this data need, an additional monitoring well shall be installed, developed, and sampled. Monitoring

well(s) will be installed in a manner to allow determination of hydraulic heads and water quality, conducting hydraulic tests, and injection and/or monitoring of tracers;

- installation and maintenance of two high elevation meteorological monitoring stations (Eureka Gulch and Ross Basin) to obtain local data on precipitation, evaporation, and related metrics;
- conducting an infiltration investigation to determine the rates and timing of infiltration and snowmelt in the area surrounding OU3 (especially within Eureka Gulch and Ross Basin); and
- evaluating the condition and safety of bulkheads at the Terry tunnel and Prince tunnel including investigations and construction needed to access the bulkheads for physical inspection.

Phase 1 shall be completed in 2018. Additional phases of work beyond Phase 1 may also be required to complete the investigation. Determination of additional work necessary will be made by EPA, in consultation with the State, and BLM.

#### **4.0 COMMUNITY RELATIONS**

EPA will develop and implement community relations activities for OU3. The Respondent shall, as requested by EPA, assist EPA by providing information regarding the Site and/or OU3 history, participating in public meetings, developing graphics, placing newspaper advertisements developed by EPA, or distributing fact sheets developed by EPA. All community relations activities conducted by the Respondent at EPA request will be subject to oversight by EPA.

#### **5.0 SITE CHARACTERIZATION**

The Respondent shall develop a comprehensive project life conceptual site model (CSM) of potential exposure pathways and potential human health and ecological receptors which shall be used to identify data gaps which serves, in part, as the basis for the scope of the RI. The CSM shall be updated to different project life stages as additional information becomes available. The Respondent shall perform activities as set forth in approved FSPs and described in this section including:

- Prepare and submit to EPA, with copies to CDPHE and BLM for review and EPA approval, or comment, in consultation with CDPHE and BLM, detailed FSPs which include standard operating procedures and other detailed information (e.g., identification of the Respondent's key project personnel) as requested by EPA, in consultation with CDPHE and BLM
- Implement the investigative elements of the EPA-approved FSPs;

- Perform the laboratory analysis of samples at EPA-approved laboratories and in accordance with the EPA-approved laboratory quality management plans (QMPs);
- Deliver laboratory data to EPA, with copies to CDPHE and BLM, in the format specified in the FSPs;
- Document field activities and deviations from FSP and QAPP requirements;
- Prepare draft, draft-final, and final data summary reports at the conclusion of each Phase or other milestone; and
- Prepare draft, draft-final, and final RI reports.

The Respondent shall identify data needed to conduct the RI including data gaps identified during initial project planning. EPA has provided the Respondent an initial list of data gaps in the memorandum dated March 3, 2017. A phased RI approach is anticipated to allow for identification and filling of additional data gaps based on newly gathered information. Use of an adaptive management strategy is recommended to refine the scope of each phase of investigation of the RI.

At the start of each phase of the RI, EPA and the Respondent shall review the CSM and discuss whether there are data gaps that need to be addressed before completing that stage of the RI. If EPA determines additional data gaps need to be addressed, EPA will issue a written determination confirming the data gap. As part of this process, EPA will confer with the Respondent regarding the scope of and the schedule for filling the data gaps. The deliverables schedule for that phase of the RI, as shown in Section 6 of this SOW, will be triggered from EPA's determination that the data gaps have been filled and final data have been received by the Respondent. Final data are data that have been validated and verified in accordance with EPA guidance set forth in the FSP.

Whenever EPA determines that a data gap exists and filling the data gap is necessary to progress and eventually complete the RI, the Respondent shall submit a draft FSP addendum within 60 days of EPA issuing the written determination or in accordance with an approved schedule (see Section 5.1 for development of FSPs). If multiple data gaps are identified as needing to be filled, thereby requiring multiple FSP addenda to be developed, the FSP addenda will be prioritized and conducted in accordance with an approved schedule (see Section 6).

The Respondent will perform all data validation and verification for the RI. The Respondent will provide copies of the data validation reports to EPA with copies to CDPHE and BLM.

### **5.1 Development and Implementation of Field Sampling Plans**

The Respondent shall develop and submit to EPA, with copies to CDPHE and BLM, for review and EPA approval, or comment, in consultation with CDPHE and BLM, pursuant to the procedures in the 2018 Administrative Order, a detailed FSP for each phase of the RI that entails sample collection and field or laboratory analysis of the collected samples. Each FSP shall be

issued by the Respondent first in draft form to the EPA, with copies to CDPHE and BLM, for review. Following satisfactory revisions by the Respondent to address any EPA and/or CDPHE and BLM comments, the Respondent shall fully implement a Final FSP for each phase of the RI. EPA may require the Respondent to include detailed information in the Final FSP (for example, standard operating procedures (SOPs), analytical laboratory reporting limits, names and responsibilities of key project personnel, schedule). Each FSP shall include a Failure Mode Effects Analysis for MIW, a Contingency, Notification, and Emergency Action Plan (see guidance document in Attachment A), and an activity-specific Health and Safety Plan (HASP). EPA will approve all final FSPs.

The final EPA-approved FSP for each phase of the RI will include a description of the goals for the specific phase, a list of key personnel and responsibilities, DQOs, field sampling plans, and schedules. The site-wide QAPPs and data management plans shall be adhered to unless task-specific deviations are approved. Each final EPA-approved FSP will describe the sampling program including the rationale, number, type, and location of samples; the sample collection, handling and custody procedures; the required field documentation and the required analytical methods.

The site-wide QAPP contains many required elements for completing field investigations, analyses of samples and data management. Data collection activities shall follow the requirements of the site-wide QAPP to the extent practicable. If needed, additions or alterations to the QAPP may be prepared for EPA review and approval. Site-wide QAPP procedures describe the measures necessary to generate data of sufficient quality to achieve the DQOs. The site-wide QAPP specifies any special training requirements and certifications, quality assurance/quality control (QA/QC) requirements for field activities and analytical processes, and data validation requirements. If any elements not included the site-wide QAPP are needed to complete the FSP work, a task-specific deviation shall be included in the FSP.

An FSP will not be implemented until approved by EPA. Each FSP shall include a schedule for, at a minimum, the start and end of field work. Respondent shall start the field work according to the EPA-approved schedule.

The Respondent shall notify EPA, the State, and BLM at least two weeks in advance of field work starting for each phase of the RI. The Respondent shall obtain written access to properties for sampling, including BLM administered public lands comprising both surface and subsurface. In addition, the Respondent shall notify by email the following BLM representative at least 14 days in advance of conducting any sampling on BLM administered public lands:

Krista Doebbler  
Abandoned Mined Lands Program  
Bureau of Land Management  
kdoebbler@blm.gov



The Respondent shall provide monthly field progress reports and participate in meetings at EPA's request. The format of the monthly field progress reports shall be specified in the FSP for such work. The Respondent shall notify EPA, the State, and BLM in writing upon completion of field activities for each phase of the RI.

For any work conducted in OU3, Respondent shall prepare a HASP and submit it to EPA and the State. Respondent shall also submit a copy of a HASP to the BLM for any work conducted on BLM-managed lands. EPA, the State, and BLM will not approve the HASP. An updated HASP may be needed if later FSPs include activities not addressed by the HASP. The Respondent are solely responsible for ensuring the health and safety of their employees or contractors performing any of the work described in this SOW.

The Respondent shall implement each final EPA-approved FSP in accordance with the schedule described in the FSP. In the event that the EPA-approved schedule shall be changed due to inclement weather or other unpredictable site hazards (for example, high fire risk), the EPA will be notified immediately and a modified schedule will be presented for EPA review and approval. The Respondent shall arrange for analytical data from laboratories to be reported directly to EPA in the format specified by EPA in the FSP. The Respondent will perform all required data validation and verification described in the FSP.

The Respondent shall record and maintain field logs and laboratory reports information gathered during site characterization. The method(s) of documentation shall be consistent with those specified in the FSP, including use of hand-held electronic data collection systems. The Respondent shall use field logs to document observations, measurements, and significant events that occur during field activities. The Respondent shall ensure that laboratory reports document sample custody, analytical responsibility, analytical results, adherence to prescribed protocols, nonconformity events, corrective measures, and/or data deficiencies.

The Respondent shall maintain field reports and sample shipment records. Analytical results developed under the FSPs shall not be included in any site characterization summary reports or RI reports unless accompanied by or cross-referenced to a corresponding QA/QC report. In addition, the Respondent shall establish a data security system to safeguard field logs, field data sheets, laboratory reports, chain of custody forms and other project records to prevent loss, damage, or alteration of project documentation. The Respondent shall submit a written description of the data security system to EPA, the State, and BLM for review and EPA approval.

## **5.2 Data Summary Reports**

Respondent shall prepare a data summary report describing the implementation of the FSP(s) or work plan(s), whichever is appropriate, at the conclusion of each phase of the RI. Each data summary report shall include the field documentation specified in the FSP(s), a description of the physical characteristics of the study area, results of all required field QA/QC procedures, and

results of all field and laboratory audits performed by the Respondent as specified in the FSP. The Respondent shall submit a data summary report for EPA review and approval, with copies to the State and the BLM in accordance with the Schedule in Section 6.

### **5.3 RI Report**

After the FSP for the final phase of the RI has been implemented, the Respondent shall prepare and submit a draft RI report to EPA, with copies to the State and the BLM, in accordance with Section XII of the 2018 Administrative Order and the schedule contained in Section 6 of this SOW. The RI report shall analyze and evaluate the data and summarize results of field activities to characterize OU3, the contaminant of potential concern (COPCs), types and sources of contamination, the nature and extent of contamination, and the fate and transport of contaminants for each impacted medium. The Respondent shall refer to Table 3-13 in “*Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA*,” OSWER Directive No. 9355.3-01 (October 1988) for a recommended RI report format, with the exception that Section 6, Section 7.1.3, Section 7.2.2, and Appendix C be excluded as EPA will prepare the baseline human health risk assessment and the baseline ecological risk assessment.

The RI report shall include the measured and potential magnitude of releases from the sources, the horizontal and vertical distribution of contamination, and the mobility, toxicity and bioavailability, persistence of COPCs. Where mathematical modeling or 3-dimensional data visualization and analysis (3DVA) are appropriate, such models or visualization shall be identified in a letter submitted for EPA review and approval, with copies to the State and the BLM, prior to their use. Upon request, the Respondent shall make available all data and programming, including any proprietary programs unless considered to be confidential business information. If proprietary programs are used, the Respondent shall provide technical assistance to the Agencies to allow for review of the information and results. Also, this evaluation shall provide any information relevant to OU3 characteristics necessary for the development and evaluation of remedial alternatives.

Respondent shall respond to the consolidated comments of EPA, the State and BLM on the draft RI report and provide a revised draft final RI in accordance with the deliverable schedule in Section 6. Respondent’s response to comments may be provided in table or Microsoft Excel® format. Respondent shall respond to the consolidated comments of EPA, the State and BLM on the draft final RI report and submit a final RI report for EPA review and approval, with copies to the State and BLM, based on the schedule set forth in Section 6 of this SOW.

If new final data become available that support the RI, Respondent shall submit an RI report addendum (or multiple RI report addenda, as appropriate) for EPA review and comment, with copies to the State and BLM, within 60 days after being notified that such final data are available. The Respondent shall incorporate EPA comments, and finalize the addenda upon EPA approval in accordance with the schedule set forth in Section 6 of this SOW.

## 6.0 SCHEDULE OF DELIVERABLES

In general, the activities for completion of the RI shall be performed in parallel rather than sequentially. This will minimize the time to complete the RI and EPA's selection of a remedy in the Proposed Plan and ROD.

The Respondent shall deliver documents and perform activities described in this SOW in accordance with the following schedule. Comments from the reviewing agencies on draft documents will be submitted to Respondent in a mutually agreed upon format (for example, Microsoft Excel) to facilitate Respondent's expedient responses.

<b>DELIVERABLES SCHEDULE</b>		
<b>SOW Reference</b>	<b>Document or Activity</b>	<b>Delivery Date</b>
Section 3.1	Provide existing information	30 days after signing Order and thereafter, 2 weeks after becoming aware of new information
Section 3.2	Notification of field visit	2 weeks prior to field visit
Section 3.2	Conduct field visit	Not later than 45 days after signing Order
Section 3.4	Submit RI work plan	45 days after signing Order
Section 4	Community relations support	As requested by EPA
Section 5.1	Draft FSP for data collection	Within 45 days after EPA issues a written determination that a data gap(s) shall be filled; FSPs will be prioritized in the order which the field work will be conducted
Section 5.1	Final FSP for data collection	45 days after receiving EPA, the State, and BLM comments on the draft FSP or no later than 2 weeks before the anticipated start date set forth in the draft FSP
Section 5.1	Implement field work to fill EPA-determined data gap	Follow schedule for field work as specified in EPA-approved FSP
Section 5.1	Health and safety plan (HASP)	2 weeks prior to field visit
Section 5.1	HASP updates necessary for FSP implementation	30 days prior to start of field work
Section 5.1	Written description of data security system	30 days prior to start of field work
Section 5.2	Draft data summary reports	In accordance with the schedule specified in the EPA-approved FSP for that phase
Section 5.2	Draft final data summary reports	45 days after receiving EPA, the State, and BLM comments on the draft data summary report
Section 5.2	Final data summary reports	45 days after receiving EPA, the State, and BLM comments on the draft final data summary report
Section 5.3	Draft RI report	180 days after receiving EPA letter notifying Respondent that field work is complete for final phase of investigation
Section 5.3	Draft Final RI report	45 days after receiving EPA, the State, and BLM comments on the draft RI Report
Section 5.3	Final RI report	45 days after receiving EPA, the State, and

<b>DELIVERABLES SCHEDULE</b>		
<b>SOW Reference</b>	<b>Document or Activity</b>	<b>Delivery Date</b>
		BLM comments on the draft final RI Report
Section 5.3	Draft RI report addendum	90 days after receipt of final data
Section 5.3	Draft Final RI report addendum	45 days after receipt of EPA, the State, and BLM comments on the draft addendum
Section 5.3	Final RI report addendum	45 days after receipt of EPA, the State, and BLM comments on the draft final addendum

# ATTACHMENT A

## List of Guidance Documents

Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA. OSWER Directive 9355.3-01

CERCLA Compliance with Other Laws Manual. Part I. Interim Final  
EPA 540/G - 89/006, OSWER No. 9234.1-01

CERCLA Compliance with Other Laws Manual: CERCLA Compliance with the CWA and SDWA. OSWER No. 9234.2-06

Planning for Response Actions at Abandoned Mines with Underground Workings: Best Practices for Preventing Sudden, Uncontrolled Fluid Mining Waste Releases. Office of Land and Emergency Management 9200.3-118

**INTERIM RECORD OF DECISION  
FOR  
BONITA PEAK MINING DISTRICT SUPERFUND SITE  
OPERABLE UNIT 1  
SAN JUAN COUNTY, COLORADO**

**INTERIM RECORD OF DECISION**  
**BONITA PEAK MINING DISTRICT SUPERFUND SITE**  
**OPERABLE UNIT 1**  
**SAN JUAN COUNTY, COLORADO**

The U.S. Environmental Protection Agency (EPA), with the concurrence of the Colorado Department of Public Health and Environment (CDPHE), presents this interim record of decision (IROD) for Operable Unit (OU) 1 of the Bonita Peak Mining District Superfund Site (Site) in San Juan County, Colorado. The IROD is based on the administrative record for OU1, including the preliminary remedial investigation (RI) and focused feasibility study (FFS), the proposed plan, the public comments received, and EPA responses. The IROD presents a brief summary of the Site characterization, past response actions, actual and potential risks to human health and the environment, and the selected interim remedy. EPA followed the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), and EPA guidance (EPA 1999) in preparing the IROD. The three purposes of the IROD are to:

1. Certify that the remedy selection process was carried out in accordance with the requirements of CERCLA, 42 United States Code (U.S.C.) § 9601 et seq., as amended, and, to the extent practicable, the NCP;
2. Outline the components and remediation requirements of the selected interim remedy; and
3. Provide the public with a consolidated source of information about the history, characteristics, and risk posed by the conditions at OU1, as well as a summary of the cleanup alternatives considered, their evaluation, the rationale behind the selected interim remedy, and the agencies' consideration of, and responses to, the comments received.

The IROD is organized in three distinct parts:

1. Part 1 (Declaration) functions as an abstract and data certification sheet for the key information in the IROD and includes the formal authorizing signature page for the IROD.
2. Part 2 (Decision Summary) provides an overview of the characteristics of OU1, alternatives evaluated, and the analysis of those options. It also identifies the selected interim remedy and explains how the remedy fulfills statutory and regulatory requirements.
3. Part 3 (Responsiveness Summary) serves the dual purpose of presenting stakeholder concerns about OU1 and preferences regarding the remedial alternatives, and explaining how those concerns were addressed and how the preferences were factored into the remedy selection process.

## **DECLARATION**



## **DECLARATION**

### **SITE NAME AND LOCATION**

The Bonita Peak Mining District Superfund Site (Site) (Superfund Enterprise Management System [SEMS] #CON000802497) is centered in southwestern Colorado in San Juan County. Within the Site, there are three main drainages (Mineral Creek, Cement Creek, and Upper Animas River), which flow into the Animas River at Silverton, Colorado. The three main drainages within the Site contain over 400 abandoned or inactive mines, where large- to small-scale mining operations occurred. The Site listing on the National Priorities List identifies 48 mining-related sources. The 48 mining-related sources were identified as sources or potential sources for contaminated media affecting the three main drainages. In addition, two dispersed campsites have been identified that contain contaminated media.

The Site is currently organized into three operable units (OUs):

- OU1: Site-wide – OU1 encompasses the entire Bonita Peak Mining District Superfund Site.
- OU2: Mayflower – OU2 includes the Mayflower Tailing Ponds No. 1, No. 2, No. 3, and No. 4 and the Mayflower Mill and Tailings Study Area.
- OU3: Bonita Peak Groundwater System – OU3 generally includes the saturated and unsaturated workings of the Sunnyside Mine, associated drainage and haulage tunnels, nearby mines not known to be connected to the Sunnyside Mine by workings (e.g. Red & Bonita Mine and Gold King Mine), and the surrounding geographic area that may be hydraulically connected or influenced by current and/or historical releases from or management of these mines.

EPA is taking an adaptive management approach to the Site, and data and observations from the initial characterization identified 26 mining-related sources (including two dispersed campsites) with contaminant migration issues that could be initially addressed through interim remedial actions (IRAs) while the Site-wide remedial investigation (RI) is ongoing. Due to minor modifications from the focused feasibility study, as described in Section 12 of the decision summary (Part 2), the selected interim remedy applies to 23 mining-related sources. Each of the 23 mining-related sources (including the two dispersed campsites) identified within this interim record of decision (IROD) are part of OU1.

### **STATEMENT OF BASIS AND PURPOSE**

This decision document presents the selected interim remedy for OU1. The remedy selected in this IROD was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The decision is based on the administrative record file for OU1 of the Site. This document is issued by EPA Region 8, the lead agency, and the Colorado Department

of Public Health and Environment (CDPHE), the support agency. EPA and CDPHE concur on the selected interim remedy presented herein.

### ASSESSMENT OF SITE

The IRAs selected in this IROD are necessary to protect the public health and welfare and the environment from actual or threatened releases of hazardous substances into the environment.

### DESCRIPTION OF SELECTED INTERIM REMEDY

The selected interim remedy will provide protection of human health and the environment in the short term and is intended to provide adequate protection until subsequent remedies are selected. The selected interim remedy addresses mine portal mining-influenced water (MIW) discharges, mining-related source/stormwater interactions, mine portal pond sediments, in-stream mine wastes, and mining-impacted recreation staging areas. The selected interim remedy includes the following five IRAs:

- The mine portal MIW discharges IRA involves construction of diversion and isolation components to route mine portal MIW discharge around contaminated mine waste with the potential for interaction and co-mingling at mining-related sources.
- The mining-related source/stormwater interactions IRA involves construction of diversion and isolation components to route stormwater around mine portals and/or contaminated mine waste with the potential for interaction and co-mingling at mining-related sources.
- The mine portal pond sediments IRA involves excavating existing sediment and repairing berms within mine portal ponds to allow continued pond function.
- The in-stream mine wastes IRA involves excavating in-stream mine wastes at mining-related sources that impede flow or are susceptible to erosion or leaching of contaminants.
- The mining-impacted recreation staging areas IRA involves containment/isolation of mine wastes within mining-impacted recreation staging areas (i.e., dispersed campsites), using covers to reduce disturbances of mine wastes and migration of contaminants.

The selected interim remedy also includes common elements that would be required to implement all five IRAs. Examples of these common elements include, but are not limited to, pre-construction surveys, erosion and sediment control measures, dust suppression, access road improvements (as necessary), generation of uncontaminated borrow for construction of remedial components and access roads, and implementation of institutional controls.

### STATUTORY DETERMINATIONS

The selected interim remedy meets the mandates of CERCLA § 121 and the NCP. The selected interim remedy will provide protection of human health and the environment in the short term until subsequent remedies are selected. It will comply with all federal and state requirements that

are applicable or relevant and appropriate to the IRAs or invoke CERCLA applicable or relevant and appropriate requirement (ARAR) waivers. The selected interim remedy is also cost effective.

Permanent solutions and alternative treatment technologies or resource recovery technologies are not a component of the selected interim remedy. The selected interim remedy is only an interim solution for OU1. Permanent solutions and alternative treatment technologies or resource recovery technologies will be addressed as part of the final remedy for the Site.

Treatment was not chosen as a component of the selected interim remedy. Because this action does not constitute the final remedy for OU1, the statutory preference for remedies that employ treatment that reduce toxicity, mobility, or volume as a principal element will be addressed by the final response action.

While the Site-wide RI and risk assessments are ongoing, it is assumed that the selected interim remedy will not result in unlimited use and unrestricted exposure land use scenarios. Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted no less often than each 5 years to ensure that the remedy is, or will be, protective of human health and the environment.

#### RECORD OF DECISION DATA CERTIFICATION CHECKLIST

The following information is included in the decision summary section (Part 2) of this IROD:

- Chemicals of potential concern (COPCs) and their respective concentrations (Section 5.0 – Summary of Site Characteristics; Appendix A – Preliminary Remedial Investigation Report);
- Current and reasonably anticipated future land use assumptions used in the risk memoranda (Section 6.0 – Current or Reasonably Anticipated Future Land and Resource Uses; Section 7.0 – Summary of Site Risks);
- Risks represented by the COPCs (Section 7.0 – Summary of Risks; Appendix B – Risk Assessment Information);
- Cleanup levels established for the COPCs and the basis for the levels (Section 8.0 – Remedial Action Objectives and Remedial Goals);
- How source materials constituting principal threats are addressed (Section 11.0 – Principal Threat Wastes; Section 12.0 – Selected Interim Remedy);
- Potential land use that will be available at the Site as a result of the selected interim remedy (Section 12.0 – Selected Interim Remedy);
- Estimated capital, annual operations and maintenance (O&M), and total present value costs; discount rate; and the number of years over which the remedy cost estimates are projected (Section 12.0 – Selected Interim Remedy); and

- Key factors that led to selecting the remedy (Section 12.0 – Selected Interim Remedy; Section 14.0 – Statutory Determinations).

Additional information can be found in the administrative record file for this Site (SEMS #CON000802497), available on [EPA's BPMD website](#).

## AUTHORIZING SIGNATURES



Betsy Smidinger, Director  
Superfund and Emergency Management Division  
U.S. EPA Region 8

5/20/19  
Date



Jennifer Opila, Division Director  
Hazardous Materials and Waste Management Division  
Colorado Department of Public Health and Environment

5/3/19  
Date

## **DECISION SUMMARY**

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## LIST OF ACRONYMS

AMD	acid-mine drainage
ARAR	applicable or relevant and appropriate requirement
ARD	acid-rock drainage
ATV	all-terrain vehicle
BLM	Bureau of Land Management
BMI	benthic macroinvertebrate
BMP	best management practice
BPMD	Bonita Peak Mining District
CAG	Community Advisory Group
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CCR	Colorado Code of Regulations
CDM Smith	CDM Federal Programs Corporation
CDMG	Colorado Division of Minerals and Geology
CDPHE	Colorado Department of Public Health and Environment
CDPS	Colorado Discharge Permit System
CFR	Code of Federal Regulations
cfs	cubic feet per second
CIP	community involvement plan
COPC	chemical of potential concern
C.R.S.	Colorado Revised Statutes
CSM	conceptual site model
EPA	U.S. Environmental Protection Agency
ESAT	Environmental Services Assistance Team
FEMA	Federal Emergency Management Agency
FFS	focused feasibility study
FRTR	Federal Remediation Technologies Roundtable
FS	feasibility study
GPS	Global Positioning System
HQ	hazard quotient
HUC	hydrologic unit code
IC	institutional control
IRA	interim remedial action
IROD	interim record of decision
LUC	land use control
MIW	mining-influenced water
MLRB	Mined Land Reclamation Board
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NGVD29	National Geodetic Vertical Datum of 1929
NOAA	National Oceanic and Atmospheric Administration
NPL	National Priorities List
O&M	operation and maintenance
OU	operable unit
PPE	personal protective equipment
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act

RG	remediation goal
RI	remedial investigation
SEMS	Superfund Enterprise Management System
Site	Bonita Peak Mining District Superfund Site
TAG	technical assistance grant
TASC	Technical Assistance Services for Communities
TechLaw	TechLaw, Inc.
U.S.C.	United States Code
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
°F	degrees Fahrenheit



## 1.0 INTRODUCTION

This interim record of decision (IROD) is for the Bonita Peak Mining District Superfund Site (Site) (Superfund Enterprise Management System [SEMS] #CON000802497). The U.S. Environmental Protection Agency (EPA) is the lead agency and the Colorado Department of Public Health and Environment (CDPHE) is the support agency. Interim remedial actions (IRAs) addressed in this IROD will be fund-financed. While the EPA will serve as the lead agency for the IRAs, the U.S. Forest Service (USFS) will implement work at Brooklyn Mine, which is located on lands managed by the U.S. Forest Service (USFS), as the lead agency for the purpose of project management with funding from the U.S. Department of Agriculture. The Site is in southwestern Colorado in San Juan County, where multiple mining-related contaminants have been found in one or more media (surface water, sediment, soil, and waste rock) due to historic mining activities.

This IROD is the decision document following a streamlined investigation and evaluation of conditions at the Site. EPA's streamlined investigation and evaluation of conditions included performing a preliminary remedial investigation (RI) and a focused feasibility study (FFS). The preliminary RI report (included as Appendix A) includes a summary of the available data to document the current understanding of the nature of mining-related contamination associated with the 23 mining-related sources in the IROD. The FFS report presents the results of the development and detailed evaluation of remedial alternatives.

The steps leading up to the IROD also included opportunities for public involvement, including participating in a public meeting for and commenting on the proposed plan (issued June 14, 2018) during the 60-day public comment period following issuance.

This IROD documents EPA's selected interim remedy for contaminant migration issues identified in the FFS. The next step in the Superfund process will be completing remedial designs followed by implementing IRAs based on the selected interim remedy documented in this IROD. Ultimately, a Site-wide RI, feasibility study (FS), and record of decision will be completed in the future to provide a final remedial solution for the Site.

### 1.1 BASIS OF INTERIM ACTIONS

EPA is pursuing the use of an adaptive management approach for the Site. Adaptive management is a formal and systematic site management approach that targets management and resource decisions with the goal of incrementally reducing site uncertainties while supporting continued site progress toward achieving protection of human health and the environment. At the Site, this strategy allows for EPA to continue to address site uncertainties through an ongoing Site-wide RI while using existing information to evaluate, select, and conduct response actions.

Data and observations from the ongoing Site-wide RI identified 26 mining-related sources (including two dispersed campsites) with contaminant migration issues that could be initially addressed through interim actions. As described in Section 12.0, due to minor modifications, the selected interim remedy applies to 23 mining-related sources.

Interim actions are defined in *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents* (EPA 1999) as those that are limited

in scope and address contaminated areas or media that will also be addressed by a final remedial action. Reasons for taking interim actions include the need to:

- Take quick action to protect human health and the environment from an imminent threat in the short term while a final remedial solution is being developed; or
- Institute temporary measures to stabilize a site and/or prevent further migration of contaminants or further environmental degradation.

As part of the adaptive management approach, the effectiveness of the IRAs will be assessed and evaluated to inform the ongoing RI and future response actions.

## **1.2 SITE DESCRIPTION**

The Site is centered in southwestern Colorado in San Juan County (Figure 1-1). Within the Site, there are three main drainages (Mineral Creek, Cement Creek, and Upper Animas River), which flow into the Animas River at Silverton as shown in Figures 1-2, 1-3, and 1-4. After the three main drainages combine as the Animas River, it flows south from Silverton to Durango, Colorado, crosses into New Mexico, and joins the San Juan River in Farmington, New Mexico.

The three main drainages within the Site contain over 400 abandoned or inactive mines, where large- to small-scale mining operations occurred. The Site listing on the National Priorities List (NPL) identifies 48 mining-related sources or potential sources for contaminated media affecting the three main drainages (EPA 2016a). The contaminated media evaluated in this IROD include solid media (i.e., mine waste, contaminated sediment, and contaminated soil) and aqueous media (i.e., mining-influenced water [MIW] and surface water). The IROD addresses five different contaminant migration issues:

- Mine portal MIW discharge
- Mining-related source/stormwater interactions
- Mine portal pond sediments
- In-stream mine wastes
- Mining-impacted recreation staging areas

The Site is currently organized into three operable units (OUs):

- OU1: Site-wide – OU1 encompasses the entire Bonita Peak Mining District Superfund Site.
- OU2: Mayflower – OU2 includes the Mayflower Tailing Ponds No. 1, No. 2, No. 3, and No. 4 and the Mayflower Mill and Tailings Study Area.
- OU3: Bonita Peak Groundwater System – OU3 generally includes the saturated and unsaturated workings of the Sunnyside Mine, associated drainage and haulage tunnels, nearby mines not known to be connected to the Sunnyside Mine by workings (e.g. Red &

Bonita Mine and Gold King Mine), and the surrounding geographic area that may be hydraulically connected or influenced by current and/or historical releases from or management of these mines.

Each of the 23 mining-related sources (including two dispersed campsites) identified are part of OU1 and are the focus of this IROD.

### **1.3 INTERIM RECORD OF DECISION FORMAT**

This IROD is organized in the following sections:

#### **Part I: Declaration**

#### **Part II: Decision Summary**

- Section 1.0 – Introduction. Provides a brief introduction to the IROD.
- Section 2.0 – Site History and Response Activities. Provides a brief history of the Site and EPA’s activities at the Site.
- Section 3.0 – Highlights of Community Participation. Describes the range of community outreach activities for the Site.
- Section 4.0 – Scope and Role of the Response Actions. Describes how the IRAs selected for the Site fit into the overall scope of the Site and the OUs.
- Section 5.0 – Summary of Site Characteristics. Contains an overview of the Site and a summary of the results of the preliminary RI.
- Section 6.0 – Current and Reasonably Anticipated Future Land and Resource Uses. Describes land and resource uses.
- Section 7.0 – Summary of Risks. Discusses the human health and ecological risk information.
- Section 8.0 – Remedial Action Objectives and Cleanup Levels. Discusses the remedial action objectives and related cleanup levels developed by EPA to protect human health and the environment at the Site.
- Section 9.0 – Description of Alternatives. Describes the remedial alternatives developed and evaluated in the FFS for each contaminant migration issue, including a description of remedy components, common elements, and expected outcomes.
- Section 10.0 – Comparative Analysis of Alternatives. Presents a summary of the remedial alternatives for each contaminant migration issue that were retained for detailed analysis in the FFS.

- Section 11.0 – Principal Threat Wastes. Discusses whether principal threat wastes were identified for the IRAs and discusses how the selected interim remedy will prevent exposure to such wastes.
- Section 12.0 – Selected Interim Remedy. Provides a detailed description of the selected interim remedy consisting of IRAs for each contaminant migration issue, including its components, cost, expected outcomes, performance standards, and compliance with EPA’s environmental justice mandate.
- Section 13.0 – Institutional and Land Use Controls. Describes the land use controls and institutional controls that will be evaluated for the selected interim remedy.
- Section 14.0 – Statutory Determinations. Describes how the selected interim remedy is protective of human health and the environment, complies with or appropriately waives applicable or relevant and appropriate requirements (ARARs), is cost effective, and uses permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable.
- Section 15.0 – Documentation of Significant Changes. Confirms no significant changes were made to the preferred alternatives outlined in the proposed plan prior to becoming the selected interim remedy described in this IROD.
- Section 16.0 – References. Provides a list of references cited in the IROD.

### **Part III: Responsiveness Summary**

- Section 1.0 – Summary of opportunities for public involvement surrounding the proposed plan.
- Section 2.0 – Summary of quantitative information about the comments received—how many stakeholders provided written comments, names of commenters serving in an official capacity (e.g., state officials, Animas River Stakeholders Group), and what topics raised the most comments, concerns, and questions. Topics where conflicting comments were received are also noted.
- Section 3.0 – Summary of how EPA is responding or making changes to the proposed plan on a general level.
- Section 4.0 – Summary (by topic) of significant comments received, both supportive and non-supportive, and EPA’s response. These are summarized by 16 primary categories of comments.
- Section 5.0 – References. Provides a list of references cited in the IROD.

## **2.0 SITE HISTORY AND RESPONSE ACTIVITIES**

### **2.1 SITE BACKGROUND AND HISTORY**

#### **2.1.1 Site Mining History**

The three main drainages within the Site contain over 400 abandoned or inactive mines, where large- to small-scale mining operations occurred. San Juan County is comprised of 10 historic mining districts (Colorado Geological Survey 2017). Historic mining districts within the Mineral Creek, Cement Creek, and Upper Animas River drainages (referred to as “the mining districts”) include Animas, Animas Forks, Cement Creek, Eureka, Ice Lake Basin, and Mineral Point. A map and descriptions of the historic mining districts are available on the Colorado Geological Survey’s website (<http://coloradogeologicalsurvey.org/mineral-resources/historic-mining-districts/san-juan-county/>).

The following background information comes from an investigation document by TechLaw (which supported the EPA/Environmental Services Assistance Team [ESAT]). Early mining activities began in the 1870s with slow initial production of ore due to the high cost and difficult access to the mines. In the late 1870s and early 1880s, the completion of roads, railroads, and construction of a smelter in Durango encouraged mining operations. The discovery of silver in the base-metal ores was the major factor in establishing Silverton as a permanent settlement (TechLaw, Inc. [TechLaw] 2017).

Furthermore, improvements to methods of concentrating low-grade ore in both the 1890s and late 1910s were implemented at the Sunnyside Mine to increase recovery of metals (Burbank and Luedke 1969). Falling metal prices in the 1890s led to a decrease in mining, and numerous smaller operations were forced to close. By 1900, there were 12 concentration mills in the valley sending products to the Kendrick and Gelder Smelter near the mouth of Cement Creek. Mining and milling operations slowed down circa 1905, and mines were consolidated into fewer and larger operations with the facilities for milling large volumes of ore. After 1907, mining and milling continued throughout the basin whenever prices were favorable (TechLaw 2017). The major mining operations in the Eureka district included the Sunnyside and Gold King Mines (Burbank and Luedke 1969). Sunnyside Mine shut down in 1930, reopened briefly in 1937–38, and then remained inactive until new ownership resumed operation of the mine in 1959 (Burbank and Luedke 1969; EPA 2016a). By the 1970s, only one year-round active mine (Sunnyside Mine) remained in the county, which closed permanently in 1991 (TechLaw 2017; EPA 2016a).

### **2.2 RESPONSE ACTIVITIES**

#### **2.2.1 Listing on the National Priorities List**

The Site was proposed for addition to the NPL in April 2016, and the listing became effective in September 2016 (EPA 2016b).

#### **2.2.2 Summary of Previous Cleanup Actions**

EPA has been active at portions of the Site prior to the NPL listing. Response actions have included efforts to control ongoing releases at the Gold King Mine and Red and Bonita Mine

(EPA 2017 and EPA 2014, respectively). Past cleanup efforts at the mining-related sources addressed in this IROD have been conducted by multiple parties (federal, state, and/or private). The following subsections describe previous cleanup actions.

#### **2.2.2.1 Mine Portal MIW Discharges**

Past efforts to address mine portal MIW discharges at the Site have included the construction of diversion channels and installation of piping to route MIW around mine waste. The following mining-related sources have had past cleanup actions to address mine portal MIW discharges:

- Bandora Mine
- Brooklyn Mine
- Frisco/Bagley Tunnel
- Junction Mine
- Henrietta Mine
- Mammoth Tunnel
- Natalie/Occidental Mine
- Pride of the West Mine
- Silver Wing Mine
- Terry Tunnel
- Yukon Tunnel

While past cleanup efforts at these mining-related sources have included construction of diversion channels and installation of piping, there is no indication that any follow-up maintenance activities have been conducted.

#### **2.2.2.2 Mine Portal Pond Sediments**

Past cleanup efforts at numerous mining-related sources have included the construction of ponds to aid in reducing chemicals of potential concern (COPCs) in MIW. The following mining-related sources have had past cleanup actions related to mine portal pond sediments:

- Anglo Saxon Mine
- Brooklyn Mine
- Frisco/Bagley Mine
- Koehler Tunnel / Junction Mine

- Mammoth Tunnel
- Silver Wing Mine
- Sunbank Group Mine

While past cleanup efforts at these mining-related sources have included construction of ponds, there is no indication that any follow-up activities to remove accumulated sediments in the ponds have been conducted.

### **2.2.3 Summary of Site Investigations**

This section provides a summary and brief discussion of select previous sampling efforts and Site investigations completed by ESAT, the U.S. Geological Survey (USGS), and the Colorado Division of Minerals and Geology (CDMG), now known as the Colorado Division of Reclamation, Mining and Safety (DRMS). Site investigations are ongoing; the data presented in the preliminary RI (Appendix A) are not intended to provide a complete characterization of the individual mining-related sources nor the complete nature and extent of contamination, but rather provide information supporting IRAs for the mining-related sources addressed in this IROD.

#### **2.2.3.1 1996–2000 USGS Sampling and Analysis**

Investigations by USGS included field sampling of mine waste, mill tailings, and adit drainages at mining-related sources in the Animas River, Cement Creek, and Mineral Creek basins, with subsequent reporting (Church et al. 2007). A summary of the work is as follows:

- The purpose of the study was to describe the magnitude of contamination contributed by mine-adit water, mine-waste dumps, and mill tailings on public land.
- Visits were conducted at more than 300 mines.
- Mine-waste dump and mill-tailings samples were collected from 97 mine waste dump sites and 18 mill tailings sites, and 20 samples of unmined, altered rock were also collected. These samples of mine-waste dump material, mill tailings, and altered rocks were studied using a passive leach method.
- The size of mine-waste dumps at mines was estimated using length, width, and thickness.
- Surface water samples were collected at 108 mine portals and mine waste dumps.
- Annually, from 1997 to 2000, observations and sampling of mine adit locations was conducted in late August or early September during low-flow conditions.

#### **2.2.3.2 1997–1999 CDMG Sampling**

Field sampling (and subsequent reporting) by CDMG of mines along the Animas River above Eureka, and along the Animas River below Eureka and in the Cement Creek and Mineral Creek basins, occurred between 1997 and 2000 (Herron et al. 1997, 1998, 1999, and 2000). A summary of the work is as follows:

- Water samples were collected for metals, ions, and wet chemistry analyses for mines on both public and private land.
- Flow measurements were collected concurrent with water samples.
- Baseline water quality samples were collected in October 1996, and February and June 1997, in Cement Creek.
- Waste rock and mill tailing samples were collected at a total of 138 mines in the Upper Animas, Cement Creek, and Mineral Creek drainages.
- The mining wastes were investigated to provide information for prioritizing future mine location reclamation activities to be performed by the Animas River Stakeholders Group.

### **2.2.3.3 2015 EPA/ESAT Sampling**

Major 2015 EPA/ESAT field activities conducted at the Site (TechLaw 2016) and relevant to this IROD include the following:

- June 9–10, 2015 – High-flow, real-time field water quality measurements, stream flow data collection, surface water sampling, photographic documentation, and Global Positioning System (GPS) coordinate collection.
- August 4–6, 2015 – Real-time field water quality measurements, surface water sampling, soil/waste rock sampling, pore water sampling, sediment sampling, photographic documentation, and GPS coordinate collection.
- September 22–26, 2015 – Low-flow, real-time field water quality measurements, stream flow data collection, surface water sampling, pore water sampling, sediment sampling, photographic documentation, and GPS coordinate collection.

### **2.2.3.4 2016 EPA/ESAT Sampling**

With field support from stakeholders such as the Bureau of Land Management (BLM), DRMS, and USFS, major 2016 EPA/ESAT field activities conducted at the Site (TechLaw 2017) and relevant to this IROD include the following:

- June 6–9, 2016 – High-flow, low elevation, real-time field water quality measurements, stream flow data collection, surface water sampling, photographic documentation, and GPS coordinate collection.
- June 28–30, 2016 – High-flow, high elevation, real-time field water quality measurements, stream flow data collection, surface water sampling, photographic documentation, and GPS coordinate collection.
- July 25–29, 2016 – Waste rock, campground, and road soil sampling, photographic documentation, and GPS coordinate collection.



- September 27–30 and October 4–8, 2016 – Low-flow, real-time field water quality measurements, stream flow data collection, surface water sampling, sediment sampling, overbank soil sampling, pore-water sampling, photographic documentation, and GPS coordinate collection.

### **3.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION**

EPA is implementing a robust program of community participation at the Site that exceeds the requirements of CERCLA. EPA began community involvement for the Site prior to the Site's listing on the NPL in September 2016, and active community involvement related to the Site continues today. A brief description of community involvement activities implemented at the Site since 2015 is provided in the following subsection. All documents described are publicly available on EPA's Bonita Peak Mining District (BPMD) website ([www.epa.gov/superfund/bonita-peak](http://www.epa.gov/superfund/bonita-peak)), along with updates on the Superfund process and coming events, access to reports and plans, and Site contacts.

#### **3.1 INTERVIEWS AND COMMUNITY INVOLVEMENT PLAN**

In late 2016 and early 2017, EPA and CDPHE conducted community interviews with stakeholders affected by the Site to obtain general information, identify community concerns and issues, and determine how best to communicate with the public. Interviewees included local officials and stakeholders from Silverton; San Juan County; Durango, Colorado; La Plata County, and the Southern Ute Indian Tribe. Findings were supplemented with information gathered during face-to-face interactions between EPA, CDPHE, and the communities.

Using the information from those interviews, a community involvement plan (CIP) was prepared and distributed in August 2017 (CDM Federal Programs Corporation [CDM Smith] 2017). The CIP is available on [EPA's BPMD website](#).

#### **3.2 INFORMATION REPOSITORIES**

EPA Region 8 established two information repositories in Colorado and assisted EPA Regions 6 and 9 in establishing repositories in New Mexico and the Navajo Nation. The repositories contain basic information for public review, documents about Site activities, technical documents, the CIP, and general information about the Superfund program.

Information repositories are located at the:

- Silverton Public Library, 1117 Reese Street, Silverton, Colorado
- Durango Public Library, 1900 East Third Avenue, Durango, Colorado
- Farmington Public Library, 2101 Farmington Avenue, Farmington, New Mexico
- Diné College Shiprock Campus Library, 1228 Yucca Street, Shiprock, New Mexico

The administrative record is housed at the EPA Superfund Records Center in Denver, Colorado. Information about the administrative record file and information repositories has been included in Site fact sheets and on [EPA's BPMD website](#).

#### **3.3 SUPPORT FOR COMMUNITY GROUPS**

EPA provided information about the availability of technical assistance to communities in presentations and in writing. A community advisory group (CAG) was formed in January 2019

to provide a forum for stakeholders and the Site team to share information and discuss issues related to the Superfund decision-making process. There have been discussions in the communities about forming an organization to apply for a technical assistance grant (TAG). Community representatives have advised EPA that enough technical expertise is available within the community to provide technical assistance as needed. EPA provided a technical advisor and a technical expert to the Silverton/San Juan County Planning Group through the Technical Assistance Services for Communities (TASC) program in 2016 and 2017.

The Silverton/San Juan County Planning Group is the entity comprised of local officials and residents that provides Silverton and San Juan County the decision-making “seat at the table,” as requested by the Governor of Colorado, Silverton, and San Juan County in their letters to EPA supporting the addition of the Site to the NPL. EPA coordinates with and involves the Silverton/San Juan County Planning Group as much as possible in all phases of work and all decisions concerning the Site.

### **3.4 FACT SHEETS**

EPA prepares fact sheets for the Site that provide information to the community at key points. Fact sheets are distributed electronically, via EPA’s electronic mailing list and are available to the public at [EPA’s BPMD website](#). Printed copies are distributed at public meetings. Examples of fact sheets issued are *Innovative Technologies*, March 2018, and *Interim Sludge Management Questions and Answers*, June 2018.

### **3.5 PUBLISHED ADVERTISEMENTS**

EPA posts public notices in local newspapers about public comment opportunities, upcoming events, and other Site-related information. These media outlets include the *Silverton Standard*, the *Durango Herald*, the *Durango Telegraph*, and the *Southern Ute Drum*.

### **3.6 PUBLIC MEETINGS AND AVAILABILITY SESSIONS**

EPA has prepared multiple presentations and handouts that provide specific information to the public. As an example, EPA has hosted fall and spring public meetings in Colorado and New Mexico, and at the Navajo Nation, to update community members about Site activities. Presentations are available on [EPA’s BPMD website](#) and include *Virtual Tour of the Water Treatment Plant at Gladstone, Colorado*; *BPMD Digging Deeper – Hydrology*; *BPMD Team Biographies*; *BPMD Hydrology Path Forward*; *Summary of Superfund Resources Available to Communities*; and *Introduction to Risk Assessment*.

### **3.7 PROPOSED PLAN, PUBLIC MEETING, AND PUBLIC COMMENT PERIOD**

EPA issued its *Proposed Plan for Interim Remedial Actions* on June 14, 2018. The proposed plan was made available in electronic format at the four Site information repositories. An electronic notice with links to relevant documents was posted on EPA’s BPMD website throughout the public comment period.

A public meeting for the proposed plan was held on June 21, 2018 in Silverton, Colorado. EPA gave a brief presentation, and the public had an opportunity to provide oral and written comment.

A stenographer provided transcription services for the meeting, and the transcript and a videotape of the presentation were made available on [EPA's BPMD website](#).

The 30-day public comment period for the proposed plan began on June 14, 2018, and was extended for an additional 30 days (through August 15, 2018) at stakeholder request. Announcement of the initial public comment period and public comment meeting were published in the June *Bonita Peak Mining District Update*, which was sent to the Site's email list on June 14, 2018. A notice of the extension of the public comment period was sent to the Site's email list July 16, 2018. Notices were also published in the *Silverton Standard*, the *Durango Herald*, the *Durango Telegraph*, and the *Southern Ute Drum*.

### 3.8 IROD RESPONSIVENESS SUMMARY

This IROD includes the responsiveness summary for the proposed plan (Part 3 of this IROD).

### 3.9 ADDITIONAL COMMUNITY ENGAGEMENT

EPA has conducted other activities with the goal of engaging and informing the public. Those activities include:

- **Electronic Updates.** EPA issues monthly updates of Site activities in the form of the *Bonita Peak Mining District Update*. These two-page updates provide recent activities, upcoming events, items new to the website, and more. Spanish-language versions are also available. Past copies of the update are available to the public from the website.
- **Early Release of Public Comment.** In response to a media request, EPA released the public comments received on its proposed plan prior to the issuance of this IROD. A fact sheet documenting this release and the redacted comments are available on EPA's BPMD website.
- **Tours.** EPA has conducted several tours specific to issues at the Site. These tours focused on cultural resources, the Gladstone interim water treatment plant, and the mining-related sources at the Site.
- **BPMD Calendar.** Beginning in May 2018, EPA posted a calendar of field activities on EPA's BPMD website so local emergency managers and the public have easy access to past, current, and planned activities.
- **Emergency Alerts.** EPA uses the *2017 Animas River Alert and Notification Plan* to communicate to participants events that affect the appearance of or water quality in the Animas River. Plan participants include state and local emergency management agencies, public health departments, downstream states and tribes, and local officials.
- **Outreach Regarding Future Land Use.** No formal process has been conducted to solicit views from the public specifically regarding future land use; however, as noted in Section 3.7, EPA has provided the public with opportunity to provide comments regarding future land use during the public meeting and the public comment period.

## **4.0 SCOPE AND ROLE OF RESPONSE ACTIONS**

The following subsections describe the scope and role of the response actions within the overall Site cleanup strategy and the relationship of the OUs.

### **4.1 OVERALL STRATEGY AND RELATIONSHIP OF OPERABLE UNITS**

The Site is currently organized into three OUs as described in Section 1.2. Each of the 23 mining-related sources (including two dispersed campsites) identified within this IROD are part of OU1. For purposes of this IROD and the overall strategy, an emphasis is placed on the three main drainage basins that make up the Site (Mineral Creek drainage basin, Cement Creek drainage basin, and Upper Animas River drainage basin), as discussed in detail in Section 5.4.

This IROD presents the selected interim remedy to address specific contaminant migration issues at the mining-related sources identified in the initial characterization and could be addressed by IRAs. These specific contaminant migration issues include:

- mine portal MIW discharges
- mining-related source/stormwater interactions
- mine portal pond sediments
- in-stream mine wastes
- mining-impacted recreation staging areas

### **4.2 APPROACH FOR INTERIM REMEDIAL ACTIONS**

The following subsections describe the relationship of contaminant migration issues that are evaluated within this IROD. In addition, this subsection describes how the list of mining-related sources were selected for this IROD.

The Site-wide RI and risk assessments are ongoing and will provide information to guide Site-wide objectives. EPA is taking an adaptive management approach to the Site as described in Section 1.1. Initial characterization identified 26 mining-related sources where IRAs may be appropriate to reduce contributions from these mining-related sources that add to unacceptable human health and ecological risks in the Animas River watershed at the Site in advance of comprehensive remedial action. As described in Section 12.0, due to minor modifications, the selected interim remedy applies to 23 mining-related sources. The actions evaluated in this IROD are intended to address identified mining-related sources to reduce risk contaminant migration. These actions have secondary benefit of reducing variability during the ongoing RI. Performance data from the IRAs will be collected and evaluated to inform the ongoing Site-wide RI and future response actions. The following subsections provide a description of each contaminant migration issue addressed in this IROD and the rationale for inclusion.

#### **4.2.1 Mine Portal MIW Discharges**

MIW is problematic when discharged from a mine portal or opening that is partially obstructed by environmental media or debris. This issue also occurs where there is a clear interaction between mine wastes that exceed ecological risk-based screening levels, as discussed in the preliminary RI, and discharged mine portal MIW. Previously installed safety measures (e.g., grates) and engineered barriers (e.g., bulkheads) are not considered for this category.

The discharge of MIW onto adjacent mine wastes could increase the potential for erosion or mass wasting of COPCs in particulate form and/or cause leaching of COPCs from the mine wastes, which contribute to unacceptable ecological risks. Obstructions to MIW discharges from mine portals also have the potential to impound MIW, sediments, and precipitates within unstable mine workings. If discharge from the mine portal is partially obstructed, it has a potential to create an unstable impoundment of MIW, sediments, and metal precipitates of limited depth. While the minimal depth of that impoundment due to a partial obstruction would not result in flooded mine workings and buildup of significant hydraulic head that results in catastrophic releases, there could be enough MIW and sediment buildup after removing a partial obstruction in a temporary surge of flow to surface water with COPCs further contributing to unacceptable ecological risks.

The specific mining-related sources evaluated in this IROD for mine portal MIW discharges are identified in Section 5.4.2.1.

#### **4.2.2 Mining-Related Source/Stormwater Interactions**

Upgradient stormwater generated from falling or stored precipitation (e.g., snowmelt) is problematic when it interacts with mine waste that exceeds ecological risk-based screening levels or interacts with (enters) a mine portal.

Co-mingling of stormwater and mining-related sources could lead to transport of COPCs to surface water, which contribute to unacceptable ecological risks. This transport could occur due to erosion or mass wasting of contaminants in particulate form, and/or infiltration of the stormwater and generation of MIW.

The specific mining-related sources evaluated in this IROD for mining-related source/stormwater interactions are identified in Section 5.4.2.2.

#### **4.2.3 Mine Portal Pond Sediments**

Sediments that exceed ecological risk-based screening levels, as discussed in the preliminary RI, are problematic when the sediments have been deposited within the horizontal extent of mine portal ponds. Sediment within mine portal ponds is partially formed when metals settle out of mine portal MIW discharge through either the formation of iron oxy-hydroxides and subsequent co-precipitation (as with arsenic), or through the physical settling of undissolved metals.

Mine portal ponds with significant sediment accumulation have reduced operational capacity (e.g., storage space), which affects MIW detention time for settling of sediments and precipitates. Reduced capacities in the mine portal ponds also increase the likelihood for “short circuiting,”

where MIW bypasses the pond or passes to the next pond in the series without sufficient retention time. The accumulated sediments in ponds also have the potential for uncontrolled release of COPCs (both in particulate form and MIW) to surface water during storm events, contributing to unacceptable ecological risks.

The specific mining-related sources evaluated in this IROD for mine portal pond sediments are identified in Section 5.4.2.3.

#### **4.2.4 In-Stream Mine Wastes**

In-stream mine wastes are mine wastes entirely within a stream are problematic when the in-stream mine wastes exceed ecological risk-based screening levels, as discussed in the preliminary RI. In-stream mine wastes impede the flow of surface water in streams, increasing the potential for erosion or mass wasting of contamination in particulate form and/or leaching of COPCs from mine wastes to surface water, which contribute to unacceptable ecological risks.

The specific mining-related sources evaluated in this IROD for in-stream mine wastes are identified in Section 5.4.2.4.

#### **4.2.5 Mining Impacted Recreation Staging Areas**

Mining-impacted recreation staging areas occur at mining-related sources used for camping related to staging for recreational uses (e.g., established campgrounds or dispersed campsites) within 1,000 feet of U.S. Highway 550 (Mineral Creek), San Juan County Road 110 (Cement Creek), and San Juan County Road 2 (Upper Animas River), and adjacent to a pond or stream. A “dispersed” campsite is an area that is suitable for camping or where camping is known to occur but may not be a formal campground. These mining-related sources have mine waste or contaminated soil that exceed applicable human health risk-based levels for arsenic or lead presented in Appendix B, Part 1. Recreation staging uses that are sedentary, such as camping, result in repeated surface disturbances that result in potential exposures of recreational human receptors to arsenic or lead.

Camping at mining-impacted recreation staging areas causes repeated disturbances of mine wastes and contaminated soils that could result in exposure to arsenic through incidental ingestion or lead through inhalation and ingestion. Many of these areas are attractive to recreational visitors because they are often flat and unvegetated, perhaps indicating to the visitor that these barren areas are supposed to be used. Contributions to human health risks (from lead under chronic exposure scenario or arsenic under acute exposure scenario) from mine wastes and contaminated soils at recreation staging areas could occur due to camping or other sedentary activities.

The specific mining-related sources evaluated in this IROD for mining-impacted recreation staging areas are identified in Section 5.4.2.5.

#### **4.2.6 Documentation Supporting IRAs**

IRAs are addressed in two EPA guidance documents: *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents* (EPA 1999) and *Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions* (EPA 1991a).

Interim actions do not require completed baseline risk assessments nor completed RI reports but must have sufficient documentation to support the rationale for IRAs to fulfill the National Oil and Hazardous Substances Pollution Contingency Plan's (NCP's) administrative record requirements. Data sufficient to support IRA decisions in an IROD can be extracted from an ongoing Site-wide RI and evaluated in an FFS that includes a short analysis of a limited number of alternatives.

EPA prepared the FFS to evaluate a limited number of remedial alternatives for specific contaminant migration issues. Because the contemplated alternatives are limited in scope, the remedial technology/process option screening and alternative screening steps suggested for a comprehensive FS are not needed. Information supporting the FFS included a preliminary RI and human health/ecological risk information memoranda completed concurrently with the FFS, which are included as Appendices A and B, respectively. This supporting information was used to characterize conditions with respect to mining-related sources with identified contaminant migration issues, determine the nature of contamination at the mining-related sources related to these migration issues, and summarize unacceptable risks to human health and aquatic ecological receptors posed by the migration of the contaminated media at these mining-related sources, to the degree they have been identified.



## **5.0 SUMMARY OF SITE CHARACTERISTICS**

The summary of Site characteristics includes an overview of physical characteristics, and the nature and extent of contamination. Additional details of the Site characteristics and the nature and extent of contamination are presented in the preliminary RI (Appendix A).

### **5.1 SITE OVERVIEW**

#### **5.1.1 Site Location and Topography**

The Site is centered in southwestern Colorado in San Juan County. The Site listing identifies 48 mining-related sources, which span across five different USGS 7.5-Minute Topographic Quadrangles including Handies Peak, Howardsville, Ironton, Ophir, and Silverton (USGS 2016a through 2016e). Within the Site, there are three main drainages (Mineral Creek, Cement Creek, and Upper Animas River), which flow into the Animas River at Silverton as shown in Figures 1-2, 1-3, and 1-4. The 48 mining-related sources were identified as sources or potential sources for contaminated media affecting the three main drainages (EPA 2016a). In addition, two dispersed campsites have been identified that contain contaminated media.

Mineral Creek originates at the top of Red Mountain Pass and flows approximately 9.3 miles before entering the Animas River southwest of Silverton. Cement Creek is approximately 8 miles long, flowing from north to south before the confluence with the Animas River at Silverton (Herron et al. 1998). The Upper Animas River begins approximately 14 miles northeast of Silverton. After the three main drainages combine as the Animas River, it flows south from Silverton to Durango, crosses into New Mexico, and joins the San Juan River in Farmington, New Mexico.

Formed from Pleistocene glaciation and Holocene erosion, the terrain of the western San Juan Mountains is steep and rugged (USGS 2007a). The elevation ranges from approximately 9,500 feet National Geodetic Vertical Datum of 1929 (NGVD29) at the Mayflower Tailings to 12,800 feet NGVD29 at the Mountain Queen Mine, the highest mining-related source at the Site.

#### **5.1.2 Climate**

The portions of the Site within San Juan County have a subalpine to alpine climate with snowy, cold winters and cool summers. In the subalpine climate region, the minimum and maximum mean temperatures for January and July are 2 degrees Fahrenheit (°F)/32°F and 40°F/74°F, respectively (Chapman et al. 2006). In the alpine climate region, the minimum and maximum mean temperatures for January and July are minus 8°F/24°F and 36°F/72°F, respectively (Chapman et al. 2006).

Long-term climate data, including precipitation, for Silverton has been collected by a participating National Weather Service Cooperative Observing Program weather station. The National Oceanic and Atmospheric Administration (NOAA) has a record of climate data for the Silverton, Colorado station dating back to 1905 (NOAA 2018). The weather station is currently located at a latitude of 37.809 North and a longitude of 107.663 West. In 2016, the Silverton station recorded annual precipitation of approximately 19 inches (NOAA 2018). The greatest amount of snowfall is between November and April, with an average snowfall of 12 feet per year (EPA 2016c).

### 5.1.3 Geology

The geology of the Site within San Juan County is relevant to the assessment of the hydrogeological framework and understanding of potential source materials present. Therefore, this section focuses on the description of the bedrock geology. Section 1.1.5 of the preliminary RI (included as Appendix A) provides additional details on the bedrock geology, ore mineralization, and Site soils. Other aspects of the Site geology were described by Yager and Bove (USGS 2007a), Burbank and Luedke (1969), and Free et al. (1989).

The Site is centered in the western San Juan Mountains in the area of the Silverton and San Juan calderas. The younger Silverton caldera is situated within the older San Juan caldera, forming between approximately 28 and 27 million years ago (Ma) (USGS 2007a). During and after the caldera formation period, volcanotectonic events occurred that introduced extensive Tertiary-aged volcanic rock and extensive mineralization within fractured host rock (USGS 2007b). Volcanic formations of the San Juan volcanic field cover land north and east of the Silverton caldera. Comprised of pyroclastic rocks and lava flows, the San Juan volcanic field lies on the Paleozoic and Mesozoic rock formation (Free et al. 1989).

### 5.1.4 Surface Water Hydrology

The Animas River watershed extends from the mountainous terrain in San Juan County, Colorado, south into the San Juan River in Northern New Mexico (URS Operating Services 2012). The three major tributaries of the Animas River in San Juan County include Mineral Creek (hydrologic unit code [HUC] 14081040103), Cement Creek (HUC 14081040102), and the Upper Animas River (HUC 14081040101). Cement Creek enters the Upper Animas River on the east side of Silverton. About 1 mile downstream from that confluence, Mineral Creek enters the Upper Animas River south of town. Stream flow for the three major tributaries at USGS gaging stations are summarized below, and the stream gaging station locations are shown on Figure 1-1.

- Mineral Creek Drainage Basin, USGS gaging station 09359010 (USGS 2018a)
  - This USGS gaging station is located at Mineral Creek, immediately southwest of Silverton. Mineral Creek confluent with the Animas River approximately  $\frac{3}{4}$  mile downstream of this gaging station.
  - The highest discharge occurs in June, with a monthly average flow of 389 cubic feet per second (cfs).
  - The lowest discharges occur throughout January and February, with monthly average flows of 21 to 22 cfs, respectively.
- Cement Creek Drainage Basin, USGS gaging station 09358550 (USGS 2018b)
  - This USGS gaging station is located at Cement Creek, immediately north of Silverton. Mineral Creek confluent with the Animas River approximately  $\frac{1}{4}$  mile downstream of this gaging station.
  - The highest discharge occurs in June, with a monthly average flow of 131 cfs.

- The lowest discharges occur throughout January and February, with monthly average flows of 13 cfs for both months.
- Upper Animas River Drainage Basin, USGS gaging station 09358000 (USGS 2018c)
  - This USGS gaging station is located at the Animas River as it flows along the southeastern edge of Silverton. Cement Creek's confluence with the Animas River is approximately  $\frac{1}{10}$  mile downstream of this gaging station.
  - The highest discharge occurs in June, with a monthly average flow of 503 cfs.
  - The lowest discharges occur throughout January and February, with monthly average flows of 24 to 26 cfs, respectively.
- Upper Animas River Drainage Basin, USGS gaging station 09359020 (USGS 2018d)
  - This USGS gaging station is located at the Animas River south of Silverton. Mineral Creek's confluence with the Animas River is approximately 1 mile upstream of this gaging station.
  - The highest discharge occurs in June, with a monthly average flow of 1,050 cfs.
  - The lowest discharges occur throughout January and February, with monthly average flows of 60 and 64 cfs, respectively.

### **5.1.5 Subsurface Hydrogeology**

Years of mining and the installation of bulkheads has significantly influenced bedrock groundwater elevations within the Site. Historically, groundwater flowed along fractures and faults, with minimal leakage through bedrock, likely due to low primary permeability. With the advent of underground mining, bedrock groundwater that once followed natural fractures instead followed the new path of least resistance—the networks of tunnels in the underground mine workings. Thus, drainage and haulage tunnels form preferential flow paths for bedrock groundwater. Water emanating from adits originated from the bedrock groundwater systems at the Site. Addressing sources of contamination within the bedrock groundwater systems or within mine workings is outside the scope of this IROD.

The presence and/or extent of perched groundwater in overburden material or alluvial groundwater is not currently known at the mining-related sources. Addressing sources of contamination within the perched or alluvial groundwater is outside the scope of this IROD.

### **5.1.6 Conceptual Site Model**

A conceptual site model (CSM) is a basic description of how contaminants enter the environment, how they are transported, and what routes of exposure to organisms and humans occur. It provides a framework for assessing risks from contaminants, developing remedial strategies, and determining source control requirements and methods to address unacceptable risks. A comprehensive CSM has not been developed for the Site, however, the CSM will be developed and included as part of the future Site-wide RI. A description of the identified

migration routes and exposure pathways relevant to the contaminant migration issues addressed by IRAs covered in this IROD is provided in Section 5.3.

## **5.2 SAMPLING STRATEGY**

Currently, EPA is collecting data to support evaluation of contributors of sources for contaminant loading of waterways and identify areas where additional data is required to evaluate the Site. Because site investigations are ongoing and there has been limited amount of sampling conducted to date, the focus has been on the nature of contamination. The data presented in the preliminary RI are not intended to provide a complete characterization of the individual mining-related sources nor the complete extent of contamination.

As discussed in Section 2.2.3, field sampling conducted to date has included field activities by USGS and CDMG between 1996 and 2000, and sampling by EPA/ESAT in 2015 and 2016. The data collected include water quality data for surface water and adit discharges, stream sediment, waste rock and soils, and mine waste leachability results. The contaminants discussed in the preliminary RI (Appendix A) include aluminum, arsenic, cadmium, copper, iron, lead, manganese, mercury, and zinc.

## **5.3 TYPES OF CONTAMINATION AND KNOWN POTENTIAL ROUTES OF MIGRATION**

### **5.3.1 Media**

The following subsections provide definitions for the contaminated media present at the mining-related sources discussed further in Section 5.4.

#### **5.3.1.1 Solid Media**

Solid media are defined as mining-related solid media that release contaminants to surface water bodies and pose unacceptable risk to human and ecological receptors. Solid media have been subdivided into three subcategories, which are discussed below.

#### **Mine Waste**

Mine waste is a mining-related solid waste with elevated contaminant concentrations, water soluble contaminant loads, and/or acid-generating potential. It includes waste rock, ore, tailings, and contaminated fills that have been generated and/or processed during mining operations.

#### **Sediment**

Sediment is a solid medium impacted by mine waste with elevated contaminant concentrations that mainly consists of metal precipitates (i.e., sludge) from untreated MIW that have settled from surface waters after discharge from mining-related sources (e.g., mine adits). Sediment typically precipitates within Site stream banks, river bottoms, and adit portal detention ponds. Sediment may also include natural material or mine waste that has been deposited within streams or detention ponds due to erosion of adjacent natural (i.e., stream banks) or mining-related source (i.e., waste rock) material. Sediment may also generate MIW when in contact with water.

## **Contaminated Soil**

Contaminated soil is native soil that has been impacted by or mixed with other contaminated media (solid or aqueous). Native soil can be affected by either physical dispersion (e.g., erosion, wind, traffic) or hydrogeochemical dispersion of contaminants. Hydrogeochemical dispersion is a broad term that relates to leaching of metals and acidity from mine waste through MIW generation, and sequestration of dissolved metals and acidity in soils as the MIW migrates over or through them.

### **5.3.1.2 Aqueous Media**

Aqueous media has been subdivided into three subcategories, which are described in the following subsections.

## **Mining-Influenced Water**

MIW is water that is contaminated or influenced by mining-related activities and is a contaminant source medium where it discharges from a mine portal or contacts a solid source medium. It is a broad term that does not specify the source of the contamination (other than a mining activity) or the pH of the water. MIW can include both acid-mine drainage (AMD) and acid-rock drainage (ARD), or water that is not acidic. AMD is metal-bearing, acidic water discharged from underground mine workings through adits, tunnels, or shafts (collectively referred to as “portals”). ARD is a similar discharge of metal-bearing acidic water resulting from water seeping or flowing through and from acid-generating materials such as pyritic waste rock, tailings piles, or mineralized rock formations. MIW forms when water and oxygen interact with sulfide-rich mine wastes, host rocks, or vein rocks. Sulfuric acid forms and can dissolve additional metals into the MIW. This MIW can discharge through adit portals and enter surface water. Both AMD and ARD provide more information about the source and nature of the water than does the term MIW; however, in this IROD, impacted water is referred to as “MIW.”

## **Surface Water**

Surface water includes water within streams or natural ponds. Impacted surface water may episodically or periodically have elevated contaminant concentrations based on contact with or migration of contaminants from solid media and/or MIW. For purposes of the IROD, surface water within Mineral Creek, Cement Creek, and the Upper Animas River and tributaries was considered the receiving water bodies at the Site.

## **Groundwater**

As discussed in Section 5.1.5, groundwater at the Site may include perched groundwater, alluvial groundwater, and bedrock groundwater systems. Groundwater will not be discussed further in this IROD because addressing groundwater is not within the scope of the IRAs.

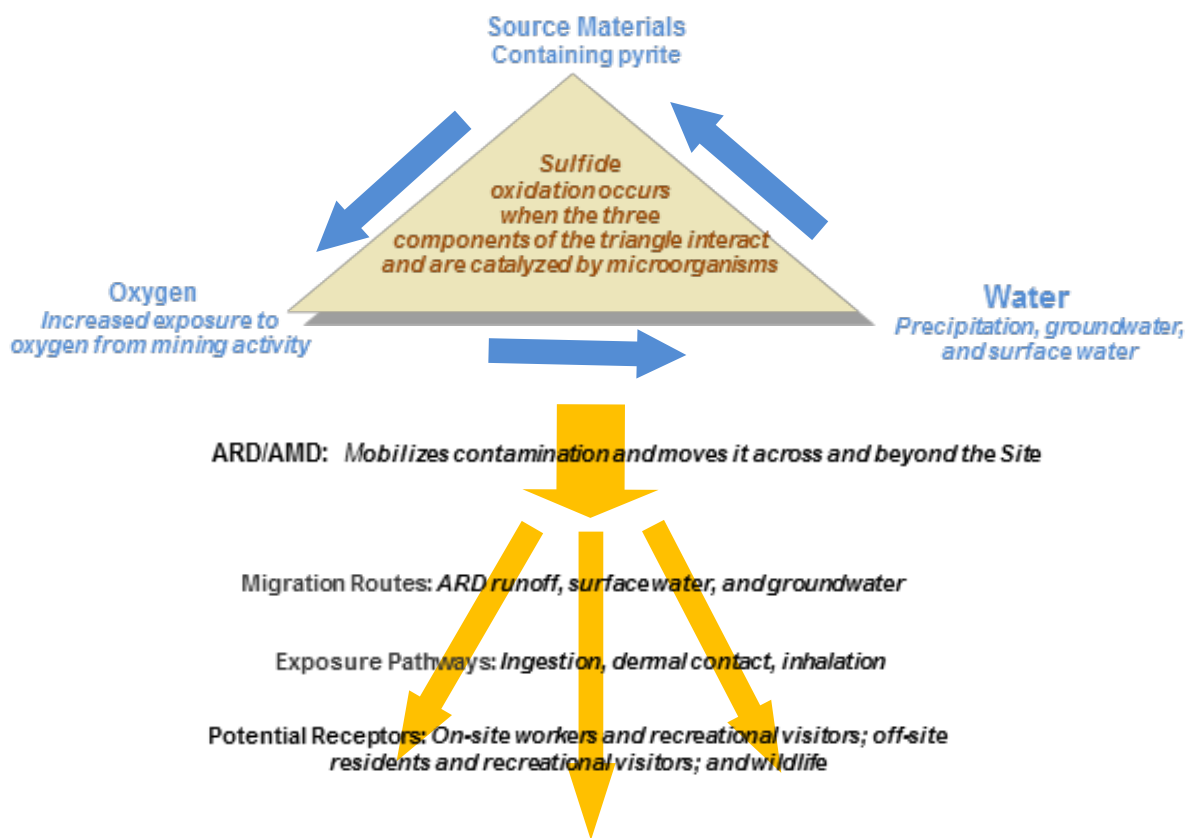
### **5.3.2 Overview of Fate and Transport**

The sources of contaminants at specific mining-related sources at the Site are presented in the preliminary RI. Site investigations are ongoing; the fate and transport discussion presented in this section is not intended to be complete and final for the Site. The fate and transport discussion

herein is focused on currently identified contaminant migration issues at the Site to be addressed through implementation of the IRAs.

Contaminants at the mining-related sources within the Site, specifically metals and metalloids (such as arsenic, which have properties of metals and non-metals), are present in solid phase materials (mine waste rock, tailings, soil, and bedrock outcrops) and in MIW at the Site. Adverse impacts are associated with transformation of solid phase metals and metalloids into forms that are mobile and potentially harmful to humans and ecological receptors. The interaction of water and oxygen with sulfide minerals, especially pyrite, can result in generation of MIW and partial or complete dissolution of metals and/or metalloids from the solid phase, which provides a mechanism for contaminant migration into surface water and potentially groundwater, where it exists. These processes increase the mobility of contaminants in the environment and therefore increase the potential for impacts to receptors.

Numerous mining-related sources within the Site contain acidic MIW in the form of AMD and ARD. Exhibit 5-1 presents a summary of the process of AMD and ARD formation and a description of the migration of these types of MIW in the environment.



#### Exhibit 5-1 ARD and AMD Generation and Migration

At the Site, the surface waters in the main stems of Cement Creek, Mineral Creek, and the Upper Animas River carry high loads of total and dissolved metals and high acidity into the Animas River near Silverton even though substantial dilution with cleaner water occurs. Aquatic life in the affected waterways is exposed to the elevated levels of metals.

### **5.3.3 Fate and Transport Pathways Related to IRA Implementation**

The following subsections describe the fate and transport mechanisms that are applicable to the specific issues addressed through implementation of IRAs at the Site.

#### **5.3.3.1 Mine Portal MIW Discharges**

Several mining-related sources contain draining adits that discharge MIW onto or adjacent to mine waste piles. These MIW discharges contacting mine waste are likely to lead to increased leaching of metals from the mine waste into surface water, as well as increase erosion and transport of mine waste or contaminated soil into receiving waters. Several other mining-related sources have constructed diversions that route the MIW discharge away from mine waste but require maintenance to prevent contact between the MIW and mine waste materials.

Many mining-related sources have mine waste that has been transported in front of a flowing adit. This mine waste can result in increased potential for obstructed adit flow and subsequent uncontrolled releases and erosion of mine waste materials into surface water.

#### **5.3.3.2 Mining-Related Source/Stormwater Interactions**

Stormwater run-on at mining-related sources can contact mine waste, which results in increased leaching of metals from the mine waste to surface water.

#### **5.3.3.3 Mine Portal Pond Sediments**

Several mining-related sources addressed by the IRAs use settling ponds to reduce metals concentrations from their adit MIW discharge. This allows metals to settle out of the adit discharge water through either formation of iron oxy-hydroxides and subsequent co-precipitation (as with arsenic), or through the physical settling of undissolved metals. This process produces residual sludge in the settling ponds. If sufficient sludge and sediment accumulates in the ponds and reduces the residence time of adit discharge in the ponds, or if accumulated sludge diverts the adit discharge such that water does not flow through the settling ponds as intended, then the ability for metals to settle out of the adit discharge water is diminished.

#### **5.3.3.4 In-Stream Mine Wastes**

Many mining-related sources have mine waste that has been transported into a stream channel. This mine waste can result in increased potential for obstructed surface water flow and subsequent uncontrolled releases and erosion of mine waste materials into surface water, as well as additional metals leaching from the obstructive mine waste into nearby surface water bodies.

#### **5.3.3.5 Mining-Impacted Recreation Staging Areas**

Several mine-related sources addressed by the IRAs are used for recreational staging purposes or camping, and these activities have the potential to physically disturb mine waste or contaminated soil, potentially increasing the potential for human exposure to contaminants.

## 5.4 SOURCE AND NATURE OF CONTAMINATION

The focus of this IROD is the mining-related sources identified in the initial characterization that could be addressed by IRAs. This IROD uses two primary characteristics, definable by location, to group mining-related sources for identification and evaluation: road accessibility and ecoregions (as they relate to elevation). Road accessibility and ecoregions were chosen because they have significant impacts on the IRAs in this IROD. Additional information on these two characteristics include:

- **Road accessibility:** Most mining-related sources are accessible via U.S. Highway 550 (paved surfacing) or San Juan County roads (gravel surfacing). The level of maintenance varies among these gravel county roads and is based on volume and speed of traffic, weather conditions, erosion, and elevation (San Juan County 2018). The FFS considers three main roads to be readily accessible (i.e., conventional access): U.S. Highway 550 (Mineral Creek), San Juan County Road 110 (Cement Creek), and San Juan County Road 2 (Upper Animas River). After conventional access ends on these named roads or a secondary road starts from them, the county roads may become narrower and are typically only accessible using a four-wheel drive vehicle (i.e., nonconventional access). The assumption in this IROD is that San Juan County Road 110 has conventional access from Silverton to the Gladstone area and that San Juan County Road 2 has conventional access from Silverton to the Eureka area.
- **Ecoregion:** Designations are based on the ecoregions of Colorado, which are made up of areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources (Chapman et al. 2006). Environmental factors that help group the ecoregions include geology, physiography, vegetation, climate, soils, land use, wildlife, and hydrology. The two ecoregions covering the mining-related sources at the Site are Volcanic Subalpine Forests and Alpine Zone. These will be referred to as “subalpine” and “alpine,” respectively, within this IROD, for simplicity. The elevation range for subalpine mining-related sources is between 9,000 and 12,000 feet in elevation, and the elevation range for alpine mining-related sources is from 10,000 to greater than 14,400 feet in elevation (Chapman et al. 2006). Additional references indicate a more precise division between the subalpine and alpine ecoregions (referred to as “zones”) at an elevation of 11,500 feet (Agnew 2005, BLM 2018, National Park Service 2018). For purpose of this IROD, the subalpine and alpine zones will be separated at an elevation of 11,500 feet.

Using the two characteristics previously discussed, mining-related sources included in this IROD have been organized into four categories as follows:

- conventional access-alpine
- conventional access-subalpine
- nonconventional access-alpine
- nonconventional access-subalpine



## 5.4.1 Summary of Drainage Basins

### 5.4.1.1 Mineral Creek Drainage Basin

The Mineral Creek drainage basin includes seven mining-related sources, five of which are addressed by IRAs in this IROD. The locations within the Mineral Creek drainage basin of these mining-related sources are shown on Figure 1-2. A summary of the mining-related sources within the Mineral Creek drainage basin addressed by this IROD is presented in Exhibit 5-2.

**Exhibit 5-2 Mining-Related Sources within Mineral Creek Drainage Basin**

Mining-Related Source	Category	Mine Portal MIW Discharges	Mining-Related Source/ Stormwater Interactions	Mine Portal Pond Sediments	In-Stream Mine Wastes	Mining-Impacted Recreation Staging Areas
Longfellow Mine	CAS					X
Junction Mine	CAS	X		X		X
Koehler Tunnel	CAS	X		X		X
Brooklyn Mine	NAS	X	X	X		
Bandora Mine	NAS	X	X			

Category: CAA – conventional access-alpine; CAS – conventional access-subalpine; NAA – nonconventional access-alpine; NAS – nonconventional access-subalpine

### 5.4.1.2 Cement Creek Drainage Basin

The Cement Creek drainage basin includes 14 mining-related sources, six of which are addressed by IRAs in this IROD. The mining-related sources specific to the IRAs are shown on Figure 1-3. A summary of the mining-related sources within the Cement Creek drainage basin addressed by this IROD is presented in Exhibit 5-3.

**Exhibit 5-3 Mining-Related Sources within Cement Creek Drainage Basin**

Mining-Related Source	Category	Mine Portal MIW Discharges	Mining-Related Source/ Stormwater Interactions	Mine Portal Pond Sediments	In-Stream Mine Wastes	Mining-Impacted Recreation Staging Areas
Grand Mogul Mine	NAA		X		X	
Natalie/Occidental Mine	NAS	X				
Henrietta Mine	NAS	X				
Mammoth Tunnel	CAS	X		X		
Anglo Saxon Mine	CAS	X		X		
Yukon Tunnel	CAS	X	X			

Category: CAA – conventional access-alpine; CAS – conventional access-subalpine; NAA – nonconventional access-alpine; NAS – nonconventional access-subalpine

### 5.4.1.3 Upper Animas River Drainage Basin

The Upper Animas River drainage basin includes 27 mining-related sources, 12 of addressed by IRAs in this IROD. The two dispersed campsites (identified as Campground 4 and Campground 7) are also located within the Upper Animas River drainage basin and are also considered mining-related sources addressed by IRAs in this IROD. The mining-related sources specific to the IRAs are shown on Figure 1-4. A summary of the mining-related within the Upper Animas River drainage basin addressed by this IROD is presented in Exhibit 5-4.

#### Exhibit 5-4 Mining-Related Sources within Upper Animas River Drainage Basin

Mining-Related Source	Category	Mine Portal MIW Discharges	Mining-Related Source/ Stormwater Interactions	Mine Portal Pond Sediments	In-Stream Mine Wastes	Mining-Impacted Recreation Staging Areas
Ben Butler Mine	NAA		X			
Mountain Queen Mine	NAA	X	X			
Vermillion Mine	NAA	X	X			
Sunbank Group Mine	NAA	X	X	X		
Frisco/Bagley Tunnel	NAS	X		X		
Columbus Mine	NAS	X	X			
Campground 7	NAS					X
Silver Wing Mine	NAS	X	X	X		
Tom Moore Mine	NAS	X				
Terry Tunnel	NAA	X				
Pride of the West Mine	NAS	X				
Campground 4	CAS					X

Category: CAA – conventional access-alpine; CAS – conventional access-subalpine; NAA – nonconventional access-alpine; NAS – nonconventional access-subalpine

#### 5.4.2 Summary of Mining-Related Source by IRAs

##### 5.4.2.1 Mine Portal MIW Discharge

Eighteen mining-related sources have mine portal MIW discharges identified to be addressed in this IROD. Exhibit 5-5 summarizes mining-related sources included for this IRA.

#### Exhibit 5-5 Summary of Mining-Related Sources for the Mine Portal MIW Discharge IRA

Mining-Related Source	Category	Mine Portal MIW Discharges
Mineral Creek Drainage Basin		
Junction Mine	CAS	X
Koehler Tunnel	CAS	X
Brooklyn Mine	NAS	X
Bandora Mine	NAS	X
Cement Creek Drainage Basin		
Natalie/Occidental Mine	NAS	X
Henrietta Mine	NAS	X
Mammoth Tunnel	CAS	X
Anglo Saxon Mine	CAS	X
Yukon Tunnel	CAS	X
Upper Animas River Drainage Basin		
Mountain Queen Mine	NAA	X
Vermillion Mine	NAA	X
Sunbank Group Mine	NAA	X
Frisco/Bagley Tunnel	NAS	X
Columbus Mine	NAS	X
Silver Wing Mine	NAS	X
Tom Moore Mine	NAS	X
Terry Tunnel	NAA	X
Pride of the West Mine	NAS	X

Category: CAA – conventional access-alpine; CAS – conventional access-subalpine; NAA – nonconventional access-alpine; NAS – nonconventional access-subalpine

Detailed descriptions, figures identifying relevant features and sample locations, and sample results for the mining-related sources evaluated in this IROD can be found in Section 4 of the preliminary RI (included as Appendix A). Brief descriptions of the mining-related sources identified for mine portal MIW discharges are as follows:

- The Junction Mine and Koehler Tunnel (along with Longfellow Mine) are co-located at the headwaters of Mineral Creek. Mine portal MIW discharges from both the Junction Mine's adit and Koehler Tunnel combine into a pond.
- The Brooklyn Mine is located on the east side of Mineral Creek within Brown's Gulch. Existing mine portal MIW discharge is piped from the Level 2 adit to a constructed channel lined with Burns Formation rock, which then discharges downgradient of the mine waste.
- The Bandora Mine is located along South Fork Mineral Creek. There are two flowing adits. Mine portal MIW discharge from the main flowing adit (which is collapsed) flows into a diversion channel and then downslope east of the main mine waste dump. However, breaks in the discharge channel allow MIW to flow over mine waste.
- The Natalie/Occidental Mine is approximately one mile southeast of Gladstone along the South Fork of Cement Creek. Mine portal MIW discharge from the adit flows southwest over soil and adjacent to waste rock before entering the creek.
- The Henrietta Mine is located on the south side of Prospect Gulch. There are portals into at least six levels of this mine. Presently, the 700 Level adit flows only during high-flow conditions and is diverted into a drainage channel that flows on the southeastern side of the waste rock. Access to this adit is partially blocked by waste rock.
- The Mammoth Tunnel is located along Cement Creek near the mouth of Georgia Gulch. Mine portal MIW discharges from a pipe protruding from the collapsed adit. The MIW flow is channelized and flows down the mine waste in a lined channel into two settling ponds.
- The Anglo Saxon Mine is located along Cement Creek approximately 3 miles upstream from Silverton. This mine consists of two adits: a main adit close to the road, and the Porcupine Gulch adit located 400 feet up Porcupine Gulch from the main adit. Mine portal MIW discharge from the main adit flows across a moderately eroded waste pile, and cascades down to a culvert underneath the road to a constructed settling pond before continuing to Cement Creek.
- The Yukon Tunnel is located along Cement Creek approximately 2.5 miles upstream from Silverton. Mine portal MIW discharge is directed within the adit into a pipe which discharges to the north of a large waste rock pile in Illinois Gulch adjacent to the mine.
- The Mountain Queen Mine is located on the east side of Hurricane Peak at the headwaters of California Gulch, with a shaft near the top of California Pass and a draining adit east of the shaft. The adit opening is covered with a grate, and rock fall

occurred recently above the grate. The mine portal MIW discharge from this adit flows around both sides of the waste rock pile located at the adit and into California Gulch.

- The Vermillion Mine is located in a large gentle swale high on the north side of California Gulch near the southwestern flank of Houghton Mountain. There is one draining adit at the Vermillion Mine site. The adit discharge flows south over soil before infiltrating into the waste rock pile. The drainage continues to flow approximately 2,000 feet south and southeast where it enters the West Fork Animas River.
- The Sunbank Group Mine is located within Placer Gulch. The main adit is sealed with a concrete block; however, flow is coming out of the top of the concrete block and from seeps upgradient of the adit block. Adit discharge is directed into a series of settling ponds immediately adjacent to Placer Gulch. The ponds appear to no longer be functional and adit drainage no longer flows sequentially through the ponds prior to discharging into Placer Gulch.
- The Frisco/Bagley Tunnel is located approximately 0.5 miles west of Animas Forks on the north side of California Gulch. A rock and mortar closure with a grate is installed at the adit portal located on top of the waste rock pile on the north side of the road. The mine portal MIW discharge is channelized southwest across a waste rock pile, and red staining is highly visible throughout the channels, which flow into California Gulch. A small settling pond is present within the channel. Additional adit flow ponds on top of the waste rock pile during periods of high flow.
- The Columbus Mine is located across the stream in California Gulch from Animas Forks. It has a single discharging adit from which mine portal MIW discharge infiltrates into the waste rock file and then emerges at the base. There are a series of seeps below both levels of waste rock that may be from the adit discharge.
- The Silver Wing Mine is located on the east side of the Upper Animas River, south of Animas Forks. Adit flow is directed into a settling pond and was formerly directed through bioreactor tanks prior to discharge to the Upper Animas River. The bioreactor tanks are not functional, and flow currently bypasses the former tanks and is piped to the river.
- The Tom Moore Mine is located approximately 0.5 miles south of the Silver Wing Mine. There is no maintained road access. There is one discharging adit from which mine portal MIW discharge flows over the waste rock pile and into the Upper Animas River.
- Terry Tunnel is located approximately 0.25 miles southeast of the Ben Franklin Mine. It is bulkheaded and buried, and most mine portal MIW discharge flows out of the bulkheaded tunnel into a drainage ditch that directs water around the reclaimed waste rock pile. MIW also seeps out below the bulkheaded tunnel and pools on the mine waste below the tunnel.
- The Pride of the West Mine is located on the east side of Cunningham Gulch. The primary adit has a metal frame cover and is chained and padlocked. The primary adit's mine portal MIW discharges through a channel on top of a large waste rock pile, through

a culvert, and down a gully on the waste rock pile into the stream. Two additional, non-flowing, grated adits are located north of the flowing adit.

#### 5.4.2.2 Mining-Related Source/Stormwater Interactions

Ten mining-related sources have mining-related source/stormwater interactions that have been identified to be addressed in this IROD. Exhibit 5-6 summarizes mining-related sources included for this IRA.

**Exhibit 5-6 Summary of Mining-Related Sources for the Mining-Related Source/Stormwater Interactions IRA**

Mining-Related Source	Category	Mining-Related Source/Stormwater Interactions
Mineral Creek Drainage Basin		
Brooklyn Mine	NAS	X
Bandora Mine	NAS	X
Cement Creek Drainage Basin		
Grand Mogul Mine	NAA	X
Yukon Tunnel	CAS	X
Upper Animas River Drainage Basin		
Ben Butler Mine	NAA	X
Mountain Queen Mine	NAA	X
Vermillion Mine	NAA	X
Sunbank Group Mine	NAA	X
Columbus Mine	NAS	X
Silver Wing Mine	NAS	X

Category: CAA – conventional access-alpine; CAS – conventional access-subalpine; NAA – nonconventional access-alpine; NAS – nonconventional access-subalpine

Detailed descriptions, figures identifying relevant features and sample locations, and sample results for the mining-related sources evaluated in this IROD can be found in Section 4 of the preliminary RI (included as Appendix A). Brief descriptions of the mining-related sources identified for mining-related sources/stormwater interactions are as follows:

- The Brooklyn Mine is located on the east side of Mineral Creek within Brown's Gulch. The topography of the area is such that stormwater from upgradient of the Brooklyn Mine passes over mine waste.
- The Bandora Mine is located along South Fork Mineral Creek. There are two flowing adits. Stormwater from upgradient of the Bandora Mine passes over mine waste due to the local topography.
- The Grand Mogul Mine is in the Ross Basin about 0.5 miles east of the Mogul Mine. Three piles of mine waste from the workings of the Grand Mogul Mine are located on the north side of Cement Creek. The topography of the area is such that stormwater from upgradient of the mine waste piles flows over them. Gullies are present on the waste rock piles and the piles have a moderate degree of erosion.

- The Yukon Tunnel is located along Cement Creek approximately 2.5 miles upstream from Silverton. The topography of the area is such that stormwater from upgradient of Yukon Tunnel passes over mine waste.
- The Ben Butler Mine is located on the north side of Burrows Creek on the south slope of Denver Hill, approximately 1,200 feet north of the London Mine. There are no direct roads to access the mining-related source. There are two shafts and three stopes at the site, which are all filled with water. The topography of the area is such that stormwater from upgradient of Ben Butler Mine passes over mine waste. A 200-yard-long vegetation kill zone extends downslope from the waste dump towards Burrows Creek.
- The Mountain Queen Mine is located on the east side of Hurricane Peak at the headwaters of California Gulch, with a shaft near the top of California Pass and a draining adit east of the shaft. The topography of the area is such that stormwater from upgradient of the adit flows over the mine waste located at the adit.
- The Vermillion Mine is located in a large gentle swale high on the north side of California Gulch near the southwestern flank of Houghton Mountain. The topography of the area is such that stormwater from upgradient of Vermillion Mine flows over mine waste.
- The Sunbank Group Mine is located within Placer Gulch. An existing stormwater diversion is located upgradient of the main waste rock pile.
- The Columbus Mine is located across the stream in California Gulch from Animas Forks. The topography of the area is such that stormwater from upgradient of the Columbus Mine passes over mine waste.
- The Silver Wing Mine is located on the east side of the Upper Animas River, south of Animas Forks. The topography of the area is such that stormwater from upgradient of Silver Wing Mine passes over mine waste.

#### **5.4.2.3 Mine Portal Pond Sediments**

Eight mining-related sources have mine portal pond sediments that have been identified to be addressed in this IROD. Exhibit 5-7 summarizes mining-related sources included for this IRA.

**Exhibit 5-7 Summary of Mining-Related Sources for the Mine Portal Pond Sediments IRA**

<b>Mining-Related Source</b>	<b>Category</b>	<b>Mine Portal Pond Sediments</b>
<b>Mineral Creek Drainage Basin</b>		
Junction Mine	CAS	X
Koehler Tunnel	CAS	X
Brooklyn Mine	NAS	X
<b>Cement Creek Drainage Basin</b>		
Mammoth Tunnel	CAS	X
Anglo Saxon Mine	CAS	X
<b>Upper Animas River Drainage Basin</b>		
Sunbank Group Mine	NAA	X
Frisco/Bagley Tunnel	NAS	X
Silver Wing Mine	NAS	X

Category: CAA – conventional access-alpine; CAS – conventional access-subalpine; NAA – nonconventional access-alpine; NAS – nonconventional access-subalpine

Detailed descriptions, figures identifying relevant features and sample locations, and sample results for the mining-related sources evaluated in this IROD can be found in Section 4 of the preliminary RI (included as Appendix A). Brief descriptions of the mining-related sources identified for mine portal pond sediments are as follows:

- The Junction Mine and Koehler Tunnel (along with Longfellow Mine) are co-located at the headwaters of Mineral Creek. Mine portal MIW discharges from both the Junction Mine’s adit and Koehler Tunnel combine into a pond.
- The Brooklyn Mine is located on the east side of Mineral Creek within Brown’s Gulch. Two ponds are located east of the primary mine area.
- The Mammoth Tunnel is located along Cement Creek near the mouth of Georgia Gulch. Mine portal MIW discharges from a pipe protruding from the collapsed adit. The MIW flow is channelized and flows down the mine waste in a lined channel into two settling ponds.
- The Anglo Saxon Mine is located along Cement Creek approximately 3 miles upstream from Silverton. Mine portal MIW discharge from the main adit flows across a moderately eroded waste pile, and cascades down to a culvert underneath the road to a constructed settling pond before continuing to Cement Creek.
- The Sunbank Group Mine is located within Placer Gulch. Adit discharge is directed into a series of settling ponds immediately adjacent to Placer Gulch. The ponds appear to no longer be functional and adit drainage no longer flows sequentially through the ponds prior to discharging into Placer Gulch.
- The Frisco/Bagley Tunnel is located approximately 0.5 miles west of Animas Forks on the north side of California Gulch. The mine portal MIW discharge is channelized southwest across a waste rock pile, and red staining is highly visible throughout the channels, which flow into California Gulch. A small settling pond is present within the channel.

- The Silver Wing Mine is located on the east side of the Upper Animas River, south of Animas Forks. Adit flow is directed into a settling pond and was formerly directed through bioreactor tanks prior to discharge to the Upper Animas River. The bioreactor tanks are not functional, and flow currently bypasses the former tanks and is piped to the river.

#### 5.4.2.4 In-Stream Mine Wastes

One mining-related source has in-stream mine waste that has been identified to be addressed in this IROD. Exhibit 5-8 summarizes mining-related source included for this IRA.

**Exhibit 5-8 Summary of Mining-Related Source for the In-Stream Mine Wastes IRA**

Mining-Related Source	Category	In-Stream Mine Wastes
Mineral Creek Drainage Basin		
None		
Cement Creek Drainage Basin		
Grand Mogul Mine	NAA	X
Upper Animas River Drainage Basin		
None		

Category: CAA – conventional access-alpine; CAS – conventional access-subalpine;  
NAA – nonconventional access-alpine; NAS – nonconventional access-subalpine

Detailed descriptions, figures identifying relevant features and sample locations, and sample results for the mining-related sources evaluated in this IROD can be found in Section 4 of the preliminary RI (included as Appendix A). A brief description of the mining-related source identified for in-stream mine waste is as follows:

- The Grand Mogul Mine is in the Ross Basin about 0.5 miles east of the Mogul Mine. Three piles of mine waste from the workings of the Grand Mogul Mine are located on the north side of Cement Creek. A perennial tributary cuts through the smallest (west) waste rock pile.

#### 5.4.2.5 Mining-Impacted Recreation Staging Areas

Five mining-related sources have mining-impacted recreation staging areas that have been identified to be addressed in this IROD. Exhibit 5-9 summarizes mining-related sources included for this IRA.



**Exhibit 5-9 Summary of Mining-Related Sources for the Mining-Impacted Recreation Staging Areas IRA**

<b>Mining-Related Source</b>	<b>Category</b>	<b>Mining-Impacted Recreation Staging Areas</b>
<b>Mineral Creek Drainage Basin</b>		
Longfellow Mine	CAS	X
Junction Mine	CAS	X
Koehler Tunnel	CAS	X
<b>Cement Creek Drainage Basin</b>		
None		
<b>Upper Animas River Drainage Basin</b>		
Campground 7	NAS	X
Campground 4	CAS	X

Category: CAA – conventional access-alpine; CAS – conventional access-subalpine;

NAA – nonconventional access-alpine; NAS – nonconventional access-subalpine

Detailed descriptions, figures identifying relevant features and sample locations, and sample results for the mining-related sources evaluated in this IROD can be found in Section 4 of the preliminary RI (included as Appendix A). Brief descriptions of the mining-related sources identified for mining-impacted recreation staging areas are as follows:

- The Longfellow Mine, Junction Mine, and Koehler Tunnel are all co-located at the headwaters of Mineral Creek. Waste rock samples at these three locations exceeded the human health risk-based level for arsenic. The area is used as a launch point for recreational tours and is frequently visited with evidence of previous camping.
- Campground 7 is located approximately 1.1 miles south of Animas Forks, on the west side of the Upper Animas River at the road fork below a bridge crossing the Upper Animas River. Campground 7 is considered a dispersed campsite. It is near the former location of the Eclipse Smelter according to USGS (Church et al. 2007). A sample of soil/waste rock from this location exceeded the human health risk-based level for lead. It is accessible to the public and used for recreational purposes.
- Campground 4 is located near the Animas River adjacent to a spur off County Road 2 below Howardsville, Colorado, approximately 900 feet below the Howardsville bridge over the Upper Animas River. Campground 4 is considered a dispersed campsite. It was identified as a mine tailings area by Colorado Division of Minerals and Geology, described as Mill Tailings Site #20 in Herron et al. (2000). A sample of soil/waste rock from this location exceeded the human health risk-based level for lead. It is accessible to the public and used for recreational purposes.

## **6.0 CURRENT AND REASONABLY ANTICIPATED FUTURE LAND AND RESOURCE USES**

The current and reasonably anticipated future land uses for the Site are an important consideration for the development of remedial action objectives (RAOs) and remedial criteria such as cleanup levels to ensure remedial alternatives are protective of human health and the environment. The condition of the Site after remediation must be considered in evaluating future land uses or activities and the related protection to human health and the environment that is provided. Detailed information on current and future land uses within the Site are discussed in this section.

### **6.1 LAND USE**

The land within the Site includes several different ownership/management types: private mining claims, private property, parcels managed by BLM, and areas managed by the USFS. Mining-related sources evaluated in this IROD are located on private mining claims, except for the Brooklyn Mine, which is a mixed ownership mining-related source (private-public lands) where many surface features are on public land managed by the USFS.

The assumption in this IROD is that recreation will remain the predominant future land use for both public property (i.e., USFS-managed lands) and private property that have mining-related sources remediated as part of the IRAs.

#### **6.1.1 Surrounding Land Use and Population**

The Census 2010 population for San Juan County, Colorado was approximately 700 people (U.S. Census Bureau 2010). Historically, mining was the main industry in the area; therefore, there are many inactive and abandoned mines within the three watersheds. Tourism including skiing and recreation, retail, and construction are now the most common industries (DATA USA 2015, City-Data.com 2016).

### **6.2 GROUNDWATER AND SURFACE WATER USE**

Like land use, surface water supports recreational uses such as rafting. In addition, surface water from the three main drainage basins that are part of the Site (Cement Creek, Mineral Creek, Upper Animas River) are potential drinking water sources. These surface waters also serve as the habitat for a variety of aquatic organisms.

The assumption in this IROD is that recreation, potential drinking water, and ecological habitat will remain the predominant surface water uses for the Site.

Many unknowns exist about the presence and quality of groundwater at the Site. No groundwater analytical data are available for the mining-related sources addressed in this IROD. Until a comprehensive investigation of the presence and quality of groundwater can be conducted at the Site, a full determination of groundwater use at the Site cannot be completed.

## **7.0 SUMMARY OF RISKS**

While the Site-wide risk assessments are ongoing, human health and ecological risk memoranda were developed to support the development of the FFS. The human health and ecological risk memoranda (Appendix B) were developed specifically to document and summarize unacceptable risks to human health and aquatic ecological receptors posed by the migration of the identified contaminated media at mining-related sources. The following sections provide a brief overview of the risk methodology, summarize the risk results, and present the overall risk conclusions for both human health and ecological receptors.

### **7.1 HUMAN HEALTH AND ECOLOGICAL RISK**

#### **7.1.1 Potential Receptors**

Potential human receptors as identified in Appendix B, Part 1 consist of campers. Potential ecological receptors as identified in Appendix B, Part 2 consist of aquatic receptors (primarily fish and benthic macroinvertebrate [BMI] communities) (CDM Smith 2018).

#### **7.1.2 Exposure Pathways**

Human exposure pathways for which interim risks were quantitatively evaluated in Appendix B, Part 1 focused on the incidental ingestion and inhalation of soil and mine waste during camping. Potential risks to recreational and occupational receptor populations from all exposure media and pathways will be evaluated in the final human health risk assessment for the Site.

Ecological exposure pathways for which risks were quantitatively evaluated in Appendix B, Part 2 included ingestion and direct contact of aquatic receptors with surface water.

#### **7.1.3 Summary of Human Health Risk**

Human health risk, as discussed in this section, is the basis for understanding the risks associated with the following contaminant migration issue:

- Mining-impacted recreation staging areas

Properties identified as mining-related recreation use areas used for camping are exclusively evaluated for unacceptable human health risks. Appendix B, Part 1 presents the derivation and application of risk-based thresholds for human health for lead and arsenic in soil/waste rock based on a camping scenario within the mining districts. Lead and arsenic were selected for evaluation as COPCs for the IRAs because concentrations are notably elevated at several locations within the mining districts. Therefore, levels for lead and arsenic have been developed for consideration in the identification of areas that may warrant IRA based on potential human health risks. These levels are to be considered preliminary and subject to change pending finalization of the Site human health risk assessment.

Appendix B, Part 1 includes two different human health evaluations: one based on lead exposures (Part 1.1) and one based on arsenic exposures (Part 1.2) (CDM Smith 2018). Part 1.1 presents an interim evaluation of risks from chronic lead exposure during camping and presents interim lead

risk-based levels for the purposes of supporting IRA decisions in dispersed camping areas. Part 1.2 presents the derivation of acute screening levels for arsenic based on a camping scenario and compares these screening levels to measured arsenic concentrations soil and waste rock samples collected in the mining districts.

The camping scenario was selected for the human health evaluations because the camper is anticipated to be the most sedentary of receptors (i.e., not moving about being exposed to a variety of soil/mine waste sources, in contrast with hiker, hunter, fisherman, all-terrain vehicle [ATV] rider/guide, and road worker receptors), which allows an evaluation of smaller exposure areas, such as individual campgrounds. The camping scenario was also selected because the camper receptor has the highest exposure to soil compared to the other recreational receptors (e.g., hiker, hunter, recreational ATV rider) due primarily to incidental ingestion of soil. Focus was placed on exposure to children, because they are often more vulnerable to pollutants than adults and soil ingestion is higher due to increased frequency of contact through hand-to-mouth or object-to-mouth activity. Exposure parameters for the IRA risk-based levels were based on child-specific camping soil ingestion rates.

As presented in the interim human health risk evaluations included in Appendix B, Part 1, a possibility exists that adverse health effects may occur from exposures to lead or arsenic in the contaminated soils and waste rock within the mining districts. Based on the chronic evaluation of lead exposures during camping (Part 1.1), there are two dispersed campsites with unacceptable human health chronic exposures from lead in soil: Campground 4 and Campground 7 (see Figure 1-4).

In response to comments on the 14 days per year exposure frequency assumption for the dispersed camping scenario received during the public comment period for the proposed plan, an alternate trespass camping scenario was also evaluated to determine whether heavy metals (lead in particular) may pose an unacceptable risk under a shorter exposure frequency scenario. This alternate scenario evaluated an exposure frequency of 2 days per year for campers in dispersed campsites to determine if levels of lead pose a risk above a level of concern. This change would account for a family camping with a child (under the age of 6 years) present that unknowingly uses unmarked private property within the BPMD as a campsite before being discovered and asked to leave by the property owner. This alternate exposure scenario evaluation indicates that, even if the exposure frequency were assumed to be only 2 days per year, lead concentrations at both Campground 4 and Campground 7 would still be well above risk-based recreational screening levels based on an RBA of 0.6, which supports the conclusions of the FFS for inclusion in this IROD. This additional risk evaluation is included in Appendix B, Part 1.1.

Based on the acute evaluation of arsenic exposures (Part 1.2), when identifying potential locations where interim actions may be needed, the appropriate screening level (i.e., 14-day versus 2-day) will depend upon the type and duration of exposure that may reasonably be anticipated to occur at the location of interest. For example, the 14-day screening level should be used when evaluating established campgrounds and areas where extended camping may occur (e.g., the dispersed campsites), whereas the 2-day screening level should be used when evaluating other types of potential recreational use areas. There are no dispersed campsites with measured arsenic concentrations above the 14-day acute arsenic screening level. However, there are three locations (the Longfellow Mine, Junction Mine, and Koehler Tunnel; see Figure 1-2) where waste rock concentrations are higher than the 2-day acute arsenic screening level.

#### 7.1.4 Summary of Ecological Risk

Ecological risk, as discussed in this section, is the basis for understanding the risks associated with the following contaminant migration issues:

- Mine portal MIW discharge
- Mining-related source/stormwater interactions
- Mine portal pond sediments
- In-stream mine wastes

The targeted outcome of the IRAs will be to reduce contaminant loading to receiving surface waters to reduce ecological risks, as discussed in Appendix B, Part 2. The ecological risk evaluation focuses on aquatic ecological risk, primarily risks to fish. It has been noted that BMI communities in most reaches are also currently at risk, and many of the factors limiting BMI communities are like those limiting fish communities.

Fish have recently been documented in several other reaches of the Animas River and tributaries as a part of qualitative habitat surveys conducted by the USGS in 2016. These locations include trout in Cunningham Creek near its mouth, in the South Fork of Mineral Creek near its mouth, in Mineral Creek between Mill Creek and the Middle Fork of Mineral Creek, and in Mineral Creek below the South Fork of Mineral Creek (see Figure 2 in Appendix B, Part 2).

While aquatic life is unlikely to be directly exposed to MIW (i.e., mine portal discharges) prior to entering the receiving stream, MIW can significantly increase in-stream metals concentrations, subsequently contributing to risks to fish. An evaluation of the hazard quotients (HQs) is presented in Table 1 and Figures 3 through 5 in Appendix B, Part 2. HQs were computed by comparing surface water concentrations with Colorado's hardness-based chronic aquatic life water quality criteria (concentration/criteria). The Colorado State Water Quality Criteria regulation (CDPHE 2018) is the primary source of surface water benchmarks was used in the evaluation, but chronic toxicity thresholds summarized by Buchman (2008) were also used when Colorado State Water Quality Criteria were not available. Table 1 in Appendix B, Part 2 reveals there are few locations where maximum individual metal HQ values are less than one (COPCs evaluated include aluminum, cadmium, copper, and zinc), with many locations in both adit drainages and downstream surface waters demonstrating HQs greater than 100. If the value of an HQ is less than or equal to one, risk of unacceptable adverse effects in exposed organisms is deemed acceptable. If the HQ exceeds one, the risk of adverse effects in exposed organisms may be of concern, with the probability and/or severity of adverse effect tending to increase as the value of the HQ increases. HQ values should be interpreted as estimates rather than highly precise values because the values are predictions and are subject to the uncertainties inherent in both the estimates of exposure and the estimates of toxicity benchmarks. Recognizing this, surface water measurements are far elevated above water quality criteria at many locations.

## **7.2 BASIS OF ACTION**

### **7.2.1 Human Health Risk**

As discussed in Section 7.1.3, a possibility exists that adverse health effects may occur from exposures to lead or arsenic in the contaminated soils and waste rock at the mining-related sources evaluated in this IROD under a camping scenario. Based on the chronic evaluations of lead exposures during camping, there are two dispersed campsites where interim actions are recommended to address potentially unacceptable human health exposures from lead in soil: Campground 4 and Campground 7. Based on the acute evaluation of arsenic exposures during camping, there are three locations (the Longfellow Mine, Junction Mine, and Koehler Tunnel) where interim actions are recommended to address potentially unacceptable human health acute exposure of arsenic in waste rock. Thus, human health risk is the basis for addressing the following contaminant migration issue:

- Mining-impacted recreation staging areas

### **7.2.2 Ecological Risk**

As discussed in Section 7.1.4, the health of aquatic ecosystems within the Animas River and its tributaries are currently impaired by high concentrations of toxic metals emanating from a wide range of mining-related and natural sources distributed throughout the greater Animas River watershed. In many locations, metals concentrations are currently so elevated that aquatic life does not and likely cannot exist. In other locations, metals-tolerant organisms (e.g., brook trout) are currently able to persist. Actions that result in sustained metal loading reduction function to reduce toxic metals exposure to resident organisms (or potentially resident) within these streams. If enough of these actions are taken, improved survival, abundance and diversity of aquatic life can reasonably be expected where aquatic ecosystems are currently marginal. Further, expansion of the spatial extent of aquatic communities may also be possible as instream water quality improves. Thus, ecological risk is the basis for addressing the following contaminant migration issues:

- Mine portal MIW discharge
- Mining-related source/stormwater interactions
- Mine portal pond sediments
- In-stream mine wastes

## **8.0 REMEDIAL ACTION OBJECTIVES AND CLEANUP LEVELS**

### **8.1 REMEDIAL ACTION OBJECTIVES**

RAOs are typically developed by evaluating several sources of information, including results of the risk assessments and ARARs. These inputs are the basis for determining whether protection of human health and the environment is achieved for a particular remedial alternative.

The scope of the RAOs in this IROD is intended to address human health or ecological risks only for the five contaminant migration issues identified in Section 7.2. The RAOs are not intended to address all potential human health and/or ecological risks because the information (i.e., RI and human health/ecological risk information) supporting the IROD is preliminary and the actions to be taken are interim. The final remedial decisions for these mining-related sources will address all known unacceptable human health and ecological risks.

The following RAO was identified to address known aquatic ecological risks:

1. Reduce transport from mine waste, contaminated soil, and contaminated sediment into surface water of COPCs that contribute to unacceptable ecological risks.

The following RAOs were identified to address known human health risks:

2. Reduce human exposure through ingestion and inhalation to mine waste and contaminated soils containing lead that result in greater than a 5 percent chance of exceeding a blood lead level of 5 micrograms per deciliter during camping activities.
3. Reduce human exposure through ingestion of mine waste and contaminated soils containing arsenic that exceeds risk-based levels for acute exposures during camping activities.

The following subsections discuss the RAOs pertinent to each IRA for the five contaminant migration issues.

#### **8.1.1 Mine Portal MIW Discharges**

RAO 1 applies to mine portal MIW discharges IRA, which addresses known aquatic ecological risks. RAOs 2 and 3 are not pertinent.

#### **8.1.2 Mining-Related Source/Stormwater Interactions**

RAO 1 applies to mining-related source/stormwater interactions IRA, which addresses known aquatic ecological risks. RAOs 2 and 3 are not pertinent.

#### **8.1.3 Mine Portal Pond Sediments**

RAO 1 applies to the mine portal pond sediments IRA, which addresses known aquatic ecological risks. RAOs 2 and 3 are not pertinent.

#### **8.1.4 In-Stream Mine Wastes**

RAO 1 applies to the in-stream mine wastes IRA, which addresses known aquatic ecological risks. RAOs 2 and 3 are not pertinent.

#### **8.1.5 Mining-Impacted Recreation Staging Areas**

RAOs 2 and 3 apply to the mining-impacted recreation staging areas IRA, which addresses known human health risks. RAO 1 is not pertinent.

### **8.2 CLEANUP CRITERIA**

Remediation goals (RGs), or cleanup levels, are concentration-based goals for individual chemicals for specific medium and land use combinations at CERCLA sites (EPA 1991b). They are typically presented as chemical- and media-specific values that when met, achieve the RAOs. RGs are discussed in the NCP (40 Code of Federal Regulations [CFR] 300.430(e)(2)(i)). Identification and selection of the cleanup levels are typically based on RAOs, the current and reasonably anticipated future land uses, and the ARARs.

The following subsections describe the development of cleanup levels, as appropriate, and remedial clearance criteria to determine that the IRAs have achieved the RAOs through reductions of human health risks and ecological risks, respectively.

#### **8.2.1 Human Health Cleanup Levels**

Human health cleanup levels for lead and arsenic in mine wastes and contaminated soil at recreational staging areas are presented in Appendix B, Part 1. Achievement of the cleanup levels through implementation of remedial alternatives would result in acceptable risks to human health from camping.

In addition to the use of COPC analytical data to delineate the extent of remediation for mining-impacted recreation use areas, physical information such as, but not limited to, topography and soil types (i.e., relatively flat areas free of large boulders and cobbles) will be used to define the relevant exposure area for camping and thus the horizontal extent of remediation. Once the extent of remediation encompasses the horizontal extent of exposure areas for camping, the cleanup levels will then be used after remediation to determine the resulting conditions in mine waste and soil meet the RAOs for human health risk from lead and arsenic.

#### **8.2.2 Ecological Remedial Clearance Criteria**

As stated in Section 8.1, the ecological RAO includes reducing COPCs that contribute to unacceptable aquatic ecological risks from contaminated media being addressed under the scope of the IRAs. While it is possible to derive media-based cleanup levels for the contaminants addressed as part of the IRAs, the derivation is complicated by the preliminary nature of the RI and risk assessment information that focus on specific COPCs and specific receptors and exposure pathways rather than a comprehensive list of contaminants, pathways, and receptors. The ecological RAO is focused on source migration control that would contribute to, but not necessarily result in, acceptable risks for aquatic ecological receptors. For these reasons, media-



based cleanup levels have not been established for the IRAs addressing unacceptable ecological risks. In lieu of cleanup levels, the IRAs are anticipated to be guided based on remedial clearance criteria.

Remedial clearance criteria define the conditions that must be met for the remedial components or approaches to be deemed complete for purposes of the IRAs addressing unacceptable aquatic ecological risk. Because the focus of remedial alternatives addressing unacceptable aquatic ecological risks is source isolation/separation and contaminant migration control, there are not chemical-based criteria directly applied to contaminated source media (e.g., mine wastes and mine portal pond sediment) to determine completion. Rather, clearance criteria for each IRA will be established during remedy implementation to determine that the IRA components have been constructed to achieve source isolation/separation and migration control. Examples of remedial clearance criteria could include but are not limited to maximum allowable depths of accumulated sludge in mine portal ponds, minimum separation distances between MIW mine portal discharges and mine wastes, or lack of visual indications of mine waste remaining in streams. Actual remedial clearance criteria to be used will be developed during remedial design of the IRAs in conjunction with source-specific conditions.

Performance evaluation monitoring will also be conducted to measure the extent by which ecological and human health risks associated with contributions from these mining-related sources have been reduced by the IRAs. Performance evaluation monitoring demonstrating stability of mining-related sources and reductions in contributions of COPCs migrating from these contaminated source media would be used to confirm that the RAOs have been achieved. Examples of performance evaluation monitoring include collection of surface water samples for COPC analysis and measurements/observations of parameters that indicate stability with respect to surface erosion or mass movement. Actual performance evaluation monitoring approaches to be used will be developed during remedial design of the IRAs in conjunction with source-specific conditions. These data will provide information about the effectiveness of the IRAs and are intended to help inform future remedial decisions at the Site.

## 9.0 DESCRIPTION OF ALTERNATIVES

This section describes the remedial alternatives as developed and evaluated in the FFS, including a brief explanation of the alternatives developed to address the five contaminant migration issues identified in Section 7.2. It includes common elements of alternatives, description of remedy components, and expected outcomes for each alternative. The detailed evaluation and comparative analysis of alternatives described in this section is summarized in Section 10.

### 9.1 SUMMARY OF GENERAL RESPONSE ACTIONS, REMEDIAL TECHNOLOGIES, AND PROCESS OPTIONS CONSIDERED DURING ALTERNATIVE DEVELOPMENT

The two-step screening process of general response actions, remedial technologies, and process options indicated in the RI/FS guidance (EPA 1988), was excluded from the FFS due to the streamlined approach to the FFS, as discussed in Section 1. The general response actions, remedial technologies, and process options were identified based on their documented use to remediate similar contaminant migration issues at other CERCLA mine sites.

The identification process consists of the following general steps:

- Identify general response actions for the five contaminant migration issues that will satisfy the RAOs identified in Section 8.1.
- Compile remedial technologies and process options for each general response action that are viable for remediation of these contaminant migration issues using the informational sources discussed below.

The primary source of information used to identify remedial technologies and process options is the Federal Remediation Technologies Roundtable (FRTR) *Remediation Technologies Screening Matrix and Reference Guide*, Version 4.0 (FRTR 2007). Other sources of information used to identify remedial technologies and process options include previous studies and work conducted by federal and state agencies performing response action work at the Site, relevant EPA guidance, published literature and vendor information, stakeholder input, and engineering judgment based on other mine waste remediation projects with inorganic contamination.

The remedial technologies and process options presented in Exhibit 9-1 have substantial potential and applicability as standalone remedies, or have remedial benefits if combined with other remedial technologies, to achieve the RAOs identified in Section 8.1. Although other remedial technologies and process options within the identified general response actions (e.g., off-site disposal) could also be successful and were considered, they were ultimately not identified for the relatively simple scope of IRAs identified in this IROD.

**Exhibit 9-1 Identified Remedial Technologies and Process Options for the Development of Remedial Alternatives**

General Response Action	Remedial Technology	Process Option	Description of Option
No Action	None	None	No action would be taken. The contaminated media remain in their existing condition.
Institutional Controls (ICs)	Non-Engineered Controls	Governmental controls, proprietary controls, enforcement tools with IC components, and/or informational devices	ICs would be implemented as needed to maintain integrity of the proposed remedies.
Containment	Surface Source Controls	Grading	Contaminated solid media would be contoured to promote drainage and facilitate other technologies and process options.
		Soil/rock exposure barrier	Contaminated solid media would be covered with a layer of uncontaminated soil or rock with sufficient thickness to reduce erosion and eliminate surface exposure of contaminated media.
	Hydraulic Isolation, Diversion, and Separation Measures	French drain and/or interception trench	Interceptor trenches or French drains would be constructed to collect and route mine portal MIW discharge and/or stormwater migrating as surface flow or interflow around contaminated solid media to prevent co-mingling of uncontaminated and contaminated solid/aqueous media.
		Open channel	Open channels would be constructed to collect and route mine portal MIW discharge and/or stormwater around contaminated solid media to prevent co-mingling of uncontaminated and contaminated solid/aqueous media.
		Collection/diversion piping or liner	Collection/diversion piping or liner would be used to divert mine portal MIW discharge and/or stormwater around contaminated solid media.
		Berms	Berms would be constructed around contaminated solid media to prevent co-mingling of solid and aqueous media and minimize erosion and transport.
Removal, Transport, and Disposal	Removal	Mechanical removal (excavation)	Contaminated media would be excavated using mechanical methods. Dewatering (using gravity and/or amendments) at the mining-related source may be required to implement this process option.
		Pneumatic removal (vacuum excavation)	Contaminated media would be excavated using vacuum hoses, vacuum trucks, or other pneumatic conveyance systems. Dewatering (using gravity and/or amendments) at the mining-related source may be required to implement this process option.
	Transport	Mechanical transport (hauling/conveying)	Excavated contaminated media would be transported by truck or other mechanical conveyance method to a disposal/management location. Dewatering (using gravity and/or amendments) at the mining-related source may be required to implement this process option.
		Pneumatic transport (vacuum extraction)	Excavated contaminated media would be piped using a vacuum system to a disposal/management location. Dewatering (using gravity and/or amendments) at the mining-related source may be required to implement this process option.
	Disposal	Interim local waste management	Excavated contaminated media would be temporarily managed locally until permanent disposal solutions are selected.

## **9.2 DEVELOPMENT OF REMEDIAL ALTERNATIVES**

Table 9-1 (A through E) provides matrices that indicate how the remedial technologies and representative process options were combined in consideration of the supplemental information to create the limited number of remedial alternatives for each contaminant migration issue for IRA in the FFS.

For alternative identification and evaluation, “representative” or “selected” process options were selected for evaluation within the remedial technology category to simplify the analysis and comparison of alternatives. An example of “representative” selection of process options is associated with the general response action of removal. Although multiple types of removal process options are identified and could be considered during remedial design, only mechanical excavation is selected as being representative for purposes of remedial alternative identification and description.

The remedial alternatives assembled for the five contaminant migration issues include:

### **Mine Portal MIW Discharges**

- Alternative A1: No Action
- Alternative A2: Diversion/Isolation

### **Mining-Related Source/Stormwater Interactions**

- Alternative B1: No Action
- Alternative B2: Stormwater Diversion/Isolation

### **Mine Portal Pond Sediments**

- Alternative C1: No Action
- Alternative C2: Excavation and Interim Local Waste Management

### **In-Stream Mine Wastes**

- Alternative D1: No Action
- Alternative D2: Excavation and Interim Local Waste Management

### **Mining-Impacted Recreation Staging Areas**

- Alternative E1: No Action
- Alternative E2: Containment/Isolation

### **9.3 COMMON ELEMENTS BETWEEN REMEDIAL ALTERNATIVES**

This subsection identifies the key common elements that would be required as part of all remedial alternatives (other than No Action alternatives). Examples of common elements include, but are not limited to, the following:

#### **9.3.1 Pre-Construction Common Elements**

- Pre-construction surveys including topographic surveys (i.e., property boundary surveys), cultural resources surveys, habitat surveys, noxious weed surveys, wetland delineations, and other surveys as identified in Appendix C of the FFS for compliance with ARARs, would be conducted as necessary prior to implementing IRAs at mining-related sources.
- Erosion and sediment control measures would be implemented, as necessary, to protect nearby areas.

#### **9.3.2 Construction Common Elements**

- It is assumed that a designated uncontaminated borrow source(s) (outside of mining-related sources) for constructing remedial components and access roads would be generated and transported from a public or private property at an on-site (i.e., within the Site) location. It is assumed that the suitable borrow location(s) would have sufficient volume to provide the required materials for each of the alternatives.
- Dust suppression would be maintained to eliminate contaminant migration during alternatives implementation. Water-based dust suppression is assumed to be conducted in most situations, but chemical-based dust suppression could be considered during construction for some specific applications like haul road maintenance.
- Access road improvements would be implemented, as necessary, to provide access to mining-related sources that are targeted for IRAs, using standard construction equipment. It is assumed that improvements would primarily be made for access from county roads and that these roads would be restored to their pre-construction condition following completion of the IRAs; however, restoration of roads to pre-construction condition may be deferred on a case-by-case basis for the selected remedy.
- Site rehabilitation/reclamation would be conducted following construction only to physically stabilize areas disturbed during IRA activities from subsequent erosion and sedimentation.

#### **9.3.3 Post-Construction Common Elements**

- ICs involve non-engineered measures, such as administrative and legal controls, that help to minimize the potential for exposure to contamination and/or protect the integrity of a response action. These include governmental controls, enforcement tools with IC components, proprietary controls, and informational devices. These controls or combinations of controls would be implemented as needed, at federally managed lands

(e.g., portions of Brooklyn Mine on lands managed by USFS) and at private properties to maintain integrity of the proposed remedial components.

#### **9.3.4 Annual or Periodic Monitoring Common Elements**

- Remedy performance monitoring would generally consist of visual inspection and/or sample collection and analysis. The specifics of the remedy performance monitoring for each alternative are detailed in the following subsections.
- Maintenance would be performed as necessary to maintain the integrity of the remedial components. The specifics of maintenance for each alternative are detailed in the following subsections.
- While the Site-wide risk assessment is ongoing, it is assumed that these proposed actions would not result in unlimited use and unrestricted exposure land use scenarios. Therefore, five-year reviews are assumed to be conducted for the mining-related sources included in the IRAs in conjunction with sources addressed by other response actions as part of Site-wide activities.

### **9.4 DESCRIPTION OF REMEDIAL ALTERNATIVES FOR MINE PORTAL MIW DISCHARGES**

#### **9.4.1 Alternative A1: No Action**

- Estimated capital cost: \$ 0
- Estimated total operations and maintenance (O&M) costs (over 15 years): \$ 0
- Estimated total periodic costs (over 15 years): \$ 0
- Estimated total present value cost: \$ 0
- Estimated construction timeframe: None
- Estimated time to achieve RAOs: will never comply with RAOs

Alternative A1 (No Action) is required by the NCP to provide an environmental baseline against which impacts of the other remedial alternatives can be compared. This alternative would leave mine portal MIW discharges and partial obstructions to these discharges in their current state, and no action would be initiated to remediate them or otherwise mitigate contaminant migration and transport with the associated contributions to unacceptable risks to the environment.

#### **Summary of Major Remedial Components and Associated Quantities for Alternative A1:**

None (no action taken)

### **Key ARARs:**

Because no action is taken, no chemical-, location-, or action-specific ARARs would be triggered.

### **Expected Outcomes:**

- While the Site-wide risk assessment is ongoing, it is assumed that the alternative would not result in unlimited use and unrestricted exposure land use scenarios.
- Unaddressed obstructed MIW discharges have a potential to create an unstable impoundment of MIW, sediments, and metal precipitates that could be released to surface water in an uncontrolled manner.
- This alternative would not reduce generation and migration of MIW, and would not reduce releases to surface water from interaction with mining-related sources.
- Mine portal MIW discharges would migrate to surface water and could continue to contribute to unacceptable ecological risks.

#### **9.4.2 Alternative A2: Diversion/Isolation**

- Estimated capital cost: \$ 1,082,000
- Estimated total O&M costs (over 15 years): \$ 1,890,000
- Estimated total periodic costs (over 15 years): \$ 301,000
- Estimated total present value cost: \$ 2,411,000
- Estimated construction timeframe: one season for individual mining-related sources, up to 5 years for all sources
- Estimated time to achieve RAOs: upon completion of construction of Alternative A2 remedy components

Alternative A2 would involve construction of diversion and isolation components to route mine portal MIW discharge around contaminated mine waste with the potential for interaction and comingling at mining-related sources. Alternative A2 would also include maintenance of previously existing and newly constructed diversion and isolation components.

Diversion or isolation components implemented at each mining-related source would be chosen on a location-by-location basis. Open channels typically would be constructed to collect mine portal MIW discharge and divert it around the existing mine waste. The construction of berms immediately upgradient of mine waste, collection/diversion piping or liners, or a combination of multiple types of components are also viable for locations that are not conducive to open-channel diversion. At mining-related sources with existing MIW diversion or isolation components, repairs would be conducted to improve the conditions of those components.

In addition to mine wastes excavated for open-channel diversion, mine wastes or other materials at the entrance to a mine portal that are partially obstructing the free flow of mine portal MIW discharge would be excavated. During the excavation process, the excavated wastes would be placed at the mining-related source for gravity dewatering. Physical characterization such as analysis of geotechnical parameters would be conducted, as needed, on excavated and dewatered mine waste to evaluate physical stability. Excavated wastes would be managed locally at the mining-related source on an interim basis. Interim local waste management would include best management practices (BMPs) such as berming, as necessary, to address fugitive dust and potential erosion and sedimentation issues. Final remedial approaches for managed wastes will be addressed as part of future remedy decisions and response actions.

Monitoring and maintenance of the diversion/isolation components and interim local waste management locations would be conducted as needed, primarily due to events that could compromise the components (e.g., lack of adherence to ICs, storm events, wildland fires). Monitoring would consist of non-intrusive (surface) visual inspection of diversion and isolation components to assess maintenance requirements and remedy performance monitoring consisting of surface water measurements and/or sample collection and analysis would be conducted to monitor effectiveness of the implemented IRA. Maintenance would be then performed as necessary to maintain the integrity of both newly constructed and previously existing diversion and isolation components.

Alternative A2 would also include implementing the common elements required for all alternatives (other than No Action alternatives), as described in Section 9.3.

#### Summary of Major Remedial Components and Associated Quantities for Alternative A2:

Exhibit 9-2 provides a summary of the major remedial components for Alternative A2 requiring construction and the estimated quantities for these components.

#### **Exhibit 9-2 Summary of Major Remedial Components and Associated Quantities for Alternative A2**

<b>Remedial Component</b>	<b>Unit</b>	<b>Estimated Quantity</b>
Estimated number of mining-related sources with mine portal MIW discharges	EA	20
Estimated total length of diversion/isolation components to be constructed	LF	3,560
Estimated in-place volume of mine wastes/materials partially obstructing mine portal MIW discharges	CY	30
Estimated weight of dewatering agent (assumed to be diatomaceous earth)	TON	4
Estimated in-place volume of borrow material for remedial component construction	CY	3,220

#### **Notes:**

Although detailed quantities have been provided, they should be considered approximate for evaluation purposes only.

This exhibit summarizes the quantities for Alternative A2 of the FFS. As described in Section 12.0, due to minor modifications, the selected interim remedy has minor differences in quantities.

EA – each, LF – linear feet, CY – cubic yards, TON – tons



### **Key ARARs:**

- Colorado Basic Standards and Methodologies for Surface Water (5 Colorado Code of Regulations [CCR] 1002-31, pursuant to Colorado Revised Statutes [C.R.S.] §§ 25-8-101-703)
- Colorado Basic Standards for Groundwater, (5 CCR 1002-41, pursuant to C.R.S. §§ 25-8-101-703)
- Colorado Solid Waste Disposal Sites and Facilities Regulations (6 CCR 1007-2, pursuant to C.R.S. §§ 30-20-100.5 et seq. §§ 30-20-101-515)
- Colorado Mined Land Reclamation Act (C.R.S. §§ 34-32-101 et. seq. and regulations 2 CCR 407-1 Rules 1.1 and 3)
- Colorado Effluent Limitations (5 CCR 1002-62, pursuant to C.R.S. § 25-8-205)

### **Expected Outcomes:**

- Alternative A2 would provide protection of human health and the environment in the short term and is intended to provide adequate protection until a final remedy is selected.
- Alternative A2 would provide stabilization of the mining-related sources and prevent further environmental degradation.
- The loading of COPCs is expected to decrease under this alternative because diversion/isolation components addressing the interaction between mine portal MIW discharges and mine wastes reduces the contact of the water with the waste, thereby reducing leaching and formation of MIW. However, the water quality in the streams, irrespective of the removed mine wastes and diversion/isolation components, would still be impacted and contribute to unacceptable ecological risks.
- While the Site-wide risk assessment is ongoing, it is assumed that the alternative would not result in unlimited use and unrestricted exposure land use scenarios.

## **9.5 DESCRIPTION OF REMEDIAL ALTERNATIVES FOR MINING-RELATED SOURCE/STORMWATER INTERACTIONS**

### **9.5.1 Alternative B1: No Action**

- Estimated capital cost: \$ 0
- Estimated total O&M costs (over 15 years): \$ 0
- Estimated total periodic costs (over 15 years): \$ 0
- Estimated total present value cost: \$ 0
- Estimated construction timeframe: None
- Estimated time to achieve RAOs: will never comply with RAOs

Alternative B1 (No Action) is required by the NCP to provide an environmental baseline against which impacts of the other remedial alternatives can be compared. This alternative would leave stormwater discharges to mining-related sources in their current state, and no action would be initiated to remediate them or otherwise mitigate contaminant migration and transport from them with the associated contributions to unacceptable risks to the environment.

#### **Summary of Major Remedial Components and Associated Quantities for Alternative B1:**

None (no action taken)

#### **Key ARARs:**

Because no action is taken, no chemical-, location-, or action-specific ARARs would be triggered.

#### **Expected Outcomes:**

- While the Site-wide risk assessment is ongoing, it is assumed that the alternative would not result in unlimited use and unrestricted exposure land use scenarios.
- This alternative would not reduce generation and migration of MIW, and would not reduce releases to surface water from interaction with mining-related sources.
- Left uncontrolled, stormwater discharges interacting with mining-related sources could migrate to surface water and could continue to contribute to unacceptable ecological risks.

#### **9.5.2 Alternative B2: Stormwater Diversion/Isolation**

- Estimated capital cost: \$ 1,035,000
- Estimated total O&M costs (over 15 years): \$ 1,260,000
- Estimated total periodic costs (over 15 years): \$ 147,000
- Estimated total present value cost: \$ 1,889,000
- Estimated construction timeframe: one season for individual mining-related sources, up to 5 years for all sources
- Estimated time to achieve RAOs: upon completion of construction of Alternative B2 remedy components

Alternative B2 would involve construction of diversion and isolation components to route stormwater around mine portals and/or contaminated mine waste with the potential for interaction and co-mingling at mining-related sources. Alternative B2 would also include maintenance of previously existing and newly constructed diversion and isolation components.

Diversion or isolation components implemented at each mining-related source would be chosen on a location-by-location basis. Open channels typically would be constructed to collect stormwater and divert it around the existing mine portals or mine waste. The construction of berms immediately upgradient of mine portals or mine waste, collection/diversion piping or liners, or a combination of multiple types of components are also viable for locations that are not

conductive to open-channel diversion. At mining-related sources with existing stormwater diversion or isolation components, repairs would be conducted to improve the conditions of those components.

Where amenable, this alternative could include subsurface components in conjunction with the surface components previously described. Subsurface components such as interception trenches or French drains could be constructed to intercept stormwater that has infiltrated into the shallow subsurface and divert it around mine portals or mine waste.

Monitoring and maintenance of the diversion/isolation components would be conducted as needed, primarily due to events that could compromise the components (e.g., lack of adherence to ICs, storm events, wildland fires). Monitoring would consist of non-intrusive (surface) visual inspection of diversion and isolation components to assess maintenance requirements and remedy performance monitoring consisting of surface water measurements and/or sample collection and analysis would be conducted to monitor effectiveness of the implemented IRA. Maintenance would be then performed as necessary to maintain the integrity of both newly constructed and previously existing diversion and isolation components.

Alternative B2 would also include implementing the common elements required for all alternatives (other than No Action alternatives), as described in Section 9.3.

### **Summary of Major Remedial Components and Associated Quantities for Alternative B2:**

Exhibit 9-3 provides a summary of the major remedial components for Alternative B2 requiring construction and the estimated quantities for these components.

#### **Exhibit 9-3 Summary of Major Remedial Components and Associated Quantities for Alternative B2**

<b>Remedial Component</b>	<b>Unit</b>	<b>Estimated Quantity</b>
Estimated number of mining-related sources with mining-related source/stormwater interactions	EA	11
Estimated total length of diversion/isolation components to be constructed	LF	4,270
Estimated in-place volume of borrow material for remedial component construction	CY	3,400

#### **Notes:**

Although detailed quantities have been provided, they should be considered approximate for evaluation purposes only.

This exhibit summarizes the quantities for Alternative B2 of the FFS. As described in Section 12.0, due to minor modifications, the selected interim remedy has minor differences in quantities.

EA – each, LF – linear feet, CY – cubic yards

### **Key ARARs:**

- Colorado Basic Standards and Methodologies for Surface Water (5 CCR 1002-31, pursuant to C.R.S. §§ 25-8-101-703)
- Colorado Basic Standards for Groundwater, (5 CCR 1002-41, pursuant to C.R.S. §§ 25-8-101-703)

- Colorado Solid Waste Disposal Sites and Facilities Regulations (6 CCR 1007-2, pursuant to C.R.S. §§ 30-20-100.5 et seq. §§ 30-20-101-515)
- Colorado Mined Land Reclamation Act (C.R.S. §§ 34-32-101 et. seq. and regulations 2 CCR 407-1 Rules 1.1 and 3)
- Colorado Effluent Limitations (5 CCR 1002-62, pursuant to C.R.S. § 25-8-205)

### **Expected Outcomes:**

- Alternative B2 would provide protection of human health and the environment in the short term and is intended to provide adequate protection until a final remedy is selected.
- Alternative B2 would provide stabilization of the mining-related sources and prevent further environmental degradation.
- Routing of stormwater around mine portals and/or contaminated mine wastes with the potential for interaction and co-mingling at mining-related sources would reduce the potential for stormwater to generate additional MIW and release particulates containing COPCs to surface water, which contribute to unacceptable ecological risks. However, the water quality in the streams, irrespective of diverted/isolated stormwater, would still be impacted.
- While the Site-wide risk assessment is ongoing, it is assumed that the alternative would not result in unlimited use and unrestricted exposure land use scenarios.

## **9.6 DESCRIPTION OF REMEDIAL ALTERNATIVES FOR MINE PORTAL POND SEDIMENTS**

### **9.6.1 Alternative C1: No Action**

- Estimated capital cost: \$ 0
- Estimated total O&M costs (over 15 years): \$ 0
- Estimated total periodic costs (over 15 years): \$ 0
- Estimated total present value cost: \$ 0
- Estimated construction timeframe: None
- Estimated time to achieve RAOs: will never comply with RAOs

Alternative C1 (No Action) is required by the NCP to provide an environmental baseline against which impacts of the other remedial alternatives can be compared. This alternative would leave mine portal pond sediments in their current state, and no further action would be initiated to remediate them or otherwise mitigate contaminant migration and transport from them with the associated contributions to unacceptable risks to the environment.

### **Summary of Major Remedial Components and Associated Quantities for Alternative BM1:**

None (no action taken)

**Key ARARs:**

Because no action is taken, no chemical-, location-, or action-specific ARARs would be triggered.

**Expected Outcomes:**

- While the Site-wide risk assessment is ongoing, it is assumed that the alternative would not result in unlimited use and unrestricted exposure land use scenarios.
- Unaddressed sediments would continue to reduce storage space of MIW in in mine portal ponds and result in the potential for uncontrolled releases of particulates and/or MIW containing COPCs to surface water, which contribute to unacceptable ecological risks.
- Unaddressed sediments in mine portal ponds have potential to remobilize COPCs in sediments and/or MIW during storm events.

**9.6.2 Alternative C2: Excavation and Interim Local Waste Management**

- Estimated capital cost: \$ 1,355,000
- Estimated total O&M costs (over 15 years): \$ 1,110,000
- Estimated total periodic costs (over 15 years): \$ 2,387,000
- Estimated total present value cost: \$ 3,384,000
- Estimated construction timeframe: one season for individual mining-related sources, up to 5 years for all sources
- Estimated time to achieve RAOs: upon completion of construction of Alternative C2 remedy components

Alternative C2 would involve excavating existing sediment and repair of berms within mine portal ponds to allow continued pond function.

Prior to removing sediment, the mine portal ponds would be drained. MIW within ponds would be managed locally solely to facilitate sediment excavation. Short-circuiting of ponds (MIW passing through or around the pond without treatment), if those conditions currently exist, would also be addressed through the construction or repair of pond berms.

Excavating sediment would be conducted at mine portal ponds to facilitate continued function of the ponds. During the excavation process, the excavated wastes would be placed at the mining-related source for gravity dewatering. The location for this activity is assumed to be amenable to dewatering without the need for liners or other isolation measures. Additional dewatering could be implemented for saturated sediment through ex situ amendment with a dewatering agent, as necessary, for handling and geotechnical stability prior to interim management at the mining-related source. Physical characterization, such as analysis of geotechnical parameters, would be conducted as needed on excavated and dewatered sediment to evaluate physical stability. Excavated wastes would be managed locally at the mining-related source on an interim basis.

Interim local waste management would include BMPs such as berming, as necessary, to address fugitive dust and potential erosion and sedimentation issues. Final remedial approaches for managed wastes would be addressed as part of future remedy decisions and response actions.

Monitoring and maintenance of the pond berms and interim local waste management locations would be conducted as needed, primarily due to events that could compromise the components (e.g., lack of adherence to ICs, storm events, wildland fires). Monitoring would consist of non-intrusive (surface) visual inspection of interim local waste management locations to assess maintenance requirements and monitor sediment levels in ponds and remedy performance monitoring consisting of surface water measurements and/or sample collection and analysis would be conducted to monitor effectiveness of the implemented IRA. Maintenance would be then performed as necessary to remove future accumulation of sediment in ponds and to maintain the integrity of both newly constructed and previously existing pond berms and interim management location components.

Alternative C2 would also include implementing the common elements required for all alternatives (other than No Action alternatives), as described in Section 9.3. The assumptions for Alternative C2 would be refined at the time of remedial design using location-specific information.

#### **Summary of Major Remedial Components and Associated Quantities for Alternative C2:**

Exhibit 9-4 provides a summary of the major remedial components for Alternative C2 requiring construction and the estimated quantities for these components.

#### **Exhibit 9-4 Summary of Major Remedial Components and Associated Quantities for Alternative C2**

<b>Remedial Component</b>	<b>Unit</b>	<b>Estimated Quantity</b>
Estimated number of mining-related sources with mine portal pond sediments	EA	8
Estimated number of ponds	EA	14
Estimated horizontal extent of ponds	SF	68,800
Estimated in-place volume of mine portal pond sediments	CY	10,200
Estimated weight of dewatering agent (assumed to be diatomaceous earth)	TON	190
Estimated in-place volume of borrow material for remedial component construction	CY	2,710

#### **Notes:**

Although detailed quantities have been provided, they should be considered approximate for evaluation purposes only.

EA – each, SF – square feet, CY – cubic yards, TON – tons

### **Key ARARs:**

- Colorado Basic Standards and Methodologies for Surface Water (5 CCR 1002-31, pursuant to C.R.S. §§ 25-8-101-703)
- Colorado Basic Standards for Groundwater, (5 CCR 1002-41, pursuant to C.R.S. §§ 25-8-101-703)
- Colorado Solid Waste Disposal Sites and Facilities Regulations (6 CCR 1007-2, pursuant to C.R.S. §§ 30-20-100.5 et seq. §§ 30-20-101-515)
- Colorado Mined Land Reclamation Act (C.R.S. §§ 34-32-101 et. seq. and regulations 2 CCR 407-1 Rules 1.1 and 3)
- Colorado Effluent Limitations (5 CCR 1002-62, pursuant to C.R.S. § 25-8-205)

### **Expected Outcomes:**

- Alternative C2 would provide protection of human health and the environment in the short term and is intended to provide adequate protection until a final remedy is selected.
- Alternative C2 would provide stabilization of the mining-related sources and prevent further environmental degradation.
- Excavating pond sediments improves the effectiveness of the pond and reduces the potential for an uncontrolled release of MIW. However, the water quality in the streams, irrespective of the removed mine portal pond sediments, would still be impacted.
- Residual risks remain from untreated mine portal pond sediments managed locally at the mining-related source on an interim basis. Long-term effectiveness of interim local management locations would be dependent on BMPs, inspection, and repair, as necessary, to maintain their integrity.
- While the Site-wide risk assessment is ongoing, it is assumed that the alternative would not result in unlimited use and unrestricted exposure land use scenarios.

## **9.7 DESCRIPTION OF REMEDIAL ALTERNATIVES FOR IN-STREAM MINE WASTES**

### **9.7.1 Alternative D1: No Action**

- Estimated capital cost: \$ 0
- Estimated total O&M costs (over 15 years): \$ 0
- Estimated total periodic costs (over 15 years): \$ 0
- Estimated total present value cost: \$ 0
- Estimated construction timeframe: None

- Estimated time to achieve RAOs: will never comply with RAOs

Alternative D1 (No Action) is required by the NCP to provide an environmental baseline against which impacts of the other remedial alternatives can be compared. This alternative would leave in-stream mine wastes in their current state, and no further action would be initiated to remediate them or otherwise mitigate contaminant migration and transport from them with the associated contributions to unacceptable risks to the environment.

### **Summary of Major Remedial Components and Associated Quantities for Alternative BM1:**

None (no action taken)

### **Key ARARs:**

Because no action is taken, no chemical-, location-, or action-specific ARARs would be triggered.

### **Expected Outcomes:**

- While the Site-wide risk assessment is ongoing, it is assumed that the alternative would not result in unlimited use and unrestricted exposure land use scenarios.
- Unaddressed in-stream mine wastes would continue to have the potential for erosion and result in the potential for releases of particulates and/or MIW containing COPCs to surface water, which contribute to unacceptable ecological risks.
- Unaddressed in-stream mine wastes have potential to remobilize COPCs in particulate form and/or MIW during storm events.

### **9.7.2 Alternative D2: Excavation and Interim Local Waste Management**

- Estimated capital cost: \$ 340,000
- Estimated total O&M costs (over 15 years): \$ 405,000
- Estimated total periodic costs (over 15 years): \$ 63,000
- Estimated total present value cost: \$ 624,000
- Estimated construction timeframe: one season for individual mining-related sources, up to 5 years for all sources
- Estimated time to achieve RAOs: upon completion of construction of Alternative D2 remedy components

Alternative D2 would involve excavating in-stream mine wastes at mining-related sources to remove wastes that impede flow and are susceptible to erosion or leaching of contaminants to surface water, which contribute to unacceptable ecological risks.

During the excavation process, the excavated wastes would be placed outside of the stream channel adjacent to the mining-related source for gravity dewatering. The location for this activity is assumed to be amenable to dewatering without the need for liners or other isolation



measures. Additional dewatering could be implemented for saturated mine wastes through ex situ amendment with a dewatering agent, as necessary, for handling and geotechnical stability prior to interim management at the mining-related source. Physical characterization such as analysis of geotechnical parameters would be conducted, as needed, on excavated and dewatered sediment to evaluate physical stability. Excavated wastes would be managed locally at the mining-related source on an interim basis. Interim local waste management would include BMPs such as berming, as necessary, to address fugitive dust and potential erosion and sedimentation issues. Final remedial approaches for managed wastes, would be addressed as part of future remedy decisions and response actions.

Monitoring and maintenance of the interim local waste management locations would be conducted as needed, primarily due to events that could compromise the components (e.g., lack of adherence to ICs, storm events, wildland fires). Monitoring would consist of non-intrusive (surface) visual inspection of interim local waste management locations to assess maintenance requirements and remedy performance monitoring consisting of surface water measurements and/or sample collection and analysis would be conducted to monitor effectiveness of the implemented IRA. Maintenance would be then performed as necessary to maintain the integrity of interim management location components.

Alternative D2 would also include implementing the common elements required for all alternatives (other than No Action alternatives), as described in Section 9.3. The assumptions for Alternative D2 would be refined at the time of remedial design using location-specific information.

### **Summary of Major Remedial Components and Associated Quantities for Alternative D2:**

Exhibit 9-5 provides a summary of the major remedial components for Alternative D2 requiring construction and the estimated quantities for these components.

**Exhibit 9-5 Summary of Major Remedial Components and Associated Quantities for Alternative D2**

<b>Remedial Component</b>	<b>Unit</b>	<b>Estimated Quantity</b>
Estimated number of mining-related sources with in-stream mine wastes	EA	2
Estimated horizontal extent of in-stream mine wastes	SF	8,900
Estimated in-place volume of in-stream mine wastes	CY	990
Estimated weight of dewatering agent (assumed to be diatomaceous earth)	TON	20
Estimated in-place volume of borrow material for remedial component construction	CY	180

**Notes:**

Although detailed quantities have been provided, they should be considered approximate for evaluation purposes only.

This exhibit summarizes the quantities for Alternative D2 of the FFS. As described in Section 12.0, due to minor modifications, the selected interim remedy has minor differences in quantities.

EA – each, SF – square feet, CY – cubic yards, TON – tons

### **Key ARARs:**

- Colorado Basic Standards and Methodologies for Surface Water (5 CCR 1002-31, pursuant to C.R.S. §§ 25-8-101-703)
- Colorado Basic Standards for Groundwater, (5 CCR 1002-41, pursuant to C.R.S. §§ 25-8-101-703)
- Colorado Solid Waste Disposal Sites and Facilities Regulations (6 CCR 1007-2, pursuant to C.R.S. §§ 30-20-100.5 et seq. §§ 30-20-101-515)
- Colorado Mined Land Reclamation Act (C.R.S. §§ 34-32-101 et. seq. and regulations 2 CCR 407-1 Rules 1.1 and 3)
- Colorado Effluent Limitations (5 CCR 1002-62, pursuant to C.R.S. § 25-8-205)

### **Expected Outcomes:**

- Alternative D2 would provide protection of human health and the environment in the short term and is intended to provide adequate protection until a final remedy is selected.
- Alternative D2 would provide stabilization of the mining-related sources and prevent further environmental degradation.
- Through removal of in-stream mine wastes, the loading of COPCs is expected to decrease because it reduces the contact of the water with the waste, thereby reducing leaching and formation of MIW. However, the water quality in the streams, irrespective of the removed mine wastes, would still be impacted.
- Residual risks would remain from untreated wastes managed locally at the mining-related source on an interim basis. Long-term effectiveness of interim local management locations would be dependent on BMPs, inspection, and repair, as necessary, to maintain their integrity.
- While the Site-wide risk assessment is ongoing, it is assumed that the alternative would not result in unlimited use and unrestricted exposure land use scenarios.

## **9.8 DESCRIPTION OF REMEDIAL ALTERNATIVES FOR MINING-IMPACTED RECREATION STAGING AREAS**

### **9.8.1 Alternative E1: No Action**

- Estimated capital cost: \$ 0
- Estimated total O&M costs (over 15 years): \$ 0
- Estimated total periodic costs (over 15 years): \$ 0
- Estimated total present value cost: \$ 0

- Estimated construction timeframe: None
- Estimated time to achieve RAOs: will never comply with RAOs

Alternative E1 (No Action) is required by the NCP to provide an environmental baseline against which impacts of the other remedial alternatives can be compared. This alternative would leave mining-impacted recreation staging areas in their current state, and no further action would be initiated to remediate them or otherwise mitigate contaminant migration and transport from them with the associated contributions to unacceptable risks to human health.

### **Summary of Major Remedial Components and Associated Quantities for Alternative BM1:**

None (no action taken)

### **Key ARARs:**

Because no action is taken, no chemical-, location-, or action-specific ARARs would be triggered.

### **Expected Outcomes:**

- While the Site-wide risk assessment is ongoing, it is assumed that the alternative would not result in unlimited use and unrestricted exposure land use scenarios.
- Repeated disturbances of unaddressed mining-impacted recreation staging areas could result in potential adverse lead and arsenic exposures to campers, assuming current or reasonably anticipated future recreational use.

## **9.8.2 Alternative E2: Containment/Isolation**

- Estimated capital cost: \$ 1,210,000
- Estimated total O&M costs (over 15 years): \$ 135,000
- Estimated total periodic costs (over 15 years): \$ 623,000
- Estimated total present value cost: \$ 1,668,000
- Estimated construction timeframe: one season for individual mining-related sources, up to 5 years for all sources
- Estimated time to achieve RAOs: upon completion of construction of Alternative E2 remedy components

Alternative E2 includes containment/isolation of mine wastes within mining-impacted recreation staging areas using covers to reduce disturbances of mine wastes and migration of contaminants.

A combination of different types of covers would be constructed at mining-impacted recreation staging areas. The covers would provide an exposure barrier and eliminate surface exposure to mine waste or contaminated soil. The covers would be sloped to promote positive drainage in order to minimize erosion and to reduce infiltration that could saturate the subsurface and compromise the integrity of the covers. The prepared mine waste or contaminated soil surface

would then be covered with an engineered layer of soil (which could be vegetated) or a surface layer of rock. The specific types of covers would be determined based on specific uses of each mining-related source and availability of sufficient quantities of suitable cover materials for that use. Covers would be revegetated or otherwise reclaimed to match active land use of each mining-impacted recreation staging area.

Monitoring and maintenance of the covers would be conducted as needed, primarily due to events that could compromise the components (e.g., lack of adherence to ICs, storm events, wildland fires). Monitoring would consist of non-intrusive (surface) visual inspection of cover components to assess remedy performance and maintenance requirements; maintenance would be then performed as necessary to maintain the integrity of cover components.

Alternative E2 would also include implementing the common elements required for all alternatives (other than No Action alternatives), as described in Section 9.3.

### **Summary of Major Remedial Components and Associated Quantities for Alternative E2:**

Exhibit 9-6 provides a summary of the major remedial components for Alternative E2 requiring construction and the estimated quantities for these components.

#### **Exhibit 9-6 Summary of Major Remedial Components and Associated Quantities for Alternative E2**

<b>Remedial Component</b>	<b>Unit</b>	<b>Estimated Quantity</b>
Estimated number of mining-related sources with mining-impacted recreation staging areas	EA	5
Estimated horizontal extent of aggregate (rock) covers to be constructed	AC	2.0
Estimated horizontal extent of soil covers to be constructed	AC	6.9
Estimated in-place volume of borrow material for remedial component construction	CY	18,600

**Notes:**

Although detailed quantities have been provided, they should be considered approximate for evaluation purposes only.

AC – acres, EA – each, CY – cubic yards

### **Key ARARs:**

- Colorado Basic Standards and Methodologies for Surface Water (5 CCR 1002-31, pursuant to C.R.S. §§ 25-8-101-703)
- Colorado Basic Standards for Groundwater, (5 CCR 1002-41, pursuant to C.R.S. §§ 25-8-101-703)
- Colorado Solid Waste Disposal Sites and Facilities Regulations (6 CCR 1007-2, pursuant to C.R.S. §§ 30-20-100.5 et seq. §§ 30-20-101-515)
- Colorado Mined Land Reclamation Act (C.R.S. §§ 34-32-101 et. seq. and regulations 2 CCR 407-1 Rules 1.1 and 3)

- Colorado Effluent Limitations (5 CCR 1002-62, pursuant to C.R.S. § 25-8-205)

**Expected Outcomes:**

- Alternative E2 would provide protection of human health and the environment in the short term and is intended to provide adequate protection until a final remedy is selected.
- Alternative E2 would provide stabilization of the mining-related sources and prevent further environmental degradation.
- Exposures to mine wastes and contaminated soils containing lead or arsenic that exceed risk-based levels are reduced through covers installed over recreation staging areas.
- ICs would be implemented to protect the integrity of the covers from inappropriate human activities that could breach the covers and cause exposures to mine wastes and contaminated soils.
- While the Site-wide risk assessment is ongoing, it is assumed that the alternative would not result in unlimited use and unrestricted exposure land use scenarios.

## **10.0 COMPARATIVE ANALYSIS OF ALTERNATIVES**

The FFS evaluated two remedial alternatives (including No Action alternatives required by the NCP) for each of the five contaminant migration issues, for a total of ten alternatives. These remedial alternatives were individually evaluated against the two threshold criteria and five balancing criteria. A comparative analysis of the remedial alternatives for each contaminant migration issue using the threshold and balancing criteria has been put into narrative form in the following subsections. The results of the individual detailed analysis for each remedial alternative are presented on Exhibit 10-1; presentation of this information aids in understanding a comparative analysis of the alternatives and identifying the key tradeoffs between them. Only significant comparative differences between alternatives are presented; the full rationale for the qualitative ratings determined as part of detailed analysis for the individual alternatives is provided in Appendix E of the FFS (CDM Smith 2018).

### **10.1 COMPARATIVE ANALYSIS OF REMEDIAL ALTERNATIVES FOR MINE PORTAL MIW DISCHARGES (ALTERNATIVES A1 AND A2)**

#### **10.1.1 Overall Protection of Human Health and the Environment**

Of the two alternatives, the No Action alternative (i.e., Alternative A1) would fail to provide adequate protection of human health and the environment in the short term until a final remedy is selected and would not achieve RAO 1 (RAOs 2 and 3 are not pertinent to this IRA). This alternative would not provide stabilization of the mining-related sources and prevent further environmental degradation. Unaddressed mine portal MIW discharge would continue to release particulates containing COPCs to surface water and generate additional MIW from interaction with mining-related sources, which contribute to unacceptable ecological risks. Thus, this alternative was given a rating of “not adequate.”

Alternative A2 was given a rating of “adequate” because, it would provide protection of human health and the environment in the short term and is intended to provide adequate protection until a final remedy is selected. This alternative would provide stabilization of the mining-related sources and prevent further environmental degradation. Alternative A2 addresses RAO 1 by constructing and/or maintaining diversion and isolation components to route mine portal MIW discharge around contaminated mine waste with the potential for interaction and co-mingling at mining-related sources. This would reduce the potential for mine portal MIW discharges to generate additional MIW and reduce transport of particulates containing COPCs to surface water, which contribute to unacceptable ecological risks. Mine wastes or other materials at the entrance to a mine portal that are partially obstructing free flow of MIW discharge would be excavated to reduce the potential for uncontrolled releases of particulates and MIW containing COPCs to surface water, which contribute to unacceptable ecological risks. Excavated wastes would be managed locally at the mining-related source on an interim basis. Interim local waste management would include BMPs such as berming, as necessary, to address fugitive dust and potential erosion and sedimentation issues. Residual risks would remain from untreated mine wastes managed locally at the mining-related sources. Long-term effectiveness of interim waste management locations would depend on BMPs, inspection, and repair, as necessary, to maintain their integrity. EPA would measure the extent by which ecological risks associated with contributions from MIW discharges have been reduced by this alternative. This data would

provide information about the effectiveness of the IRA and is intended to help inform future remedial decisions at the Site. ICs would be implemented to prevent activities that would disturb the integrity of local waste management locations and diversion/isolation components and prevent uses inconsistent with current and reasonably anticipated future land uses.

### **10.1.2 Compliance with ARARs**

Under Alternative A1, unaddressed mine portal MIW discharges would continue to release particulates containing COPCs to surface water. Because no action is taken, no chemical-, location-, or action-specific ARARs are triggered. Thus, this alternative was given a rating of “none.”

Chemical-specific ARARs would be pertinent to Alternative A2. State water quality standards for COPCs would likely not be met for the streams receiving mine portal MIW discharges after the alternative is constructed due to other contributing mining-related sources, thus the interim measures CERCLA ARAR waiver would be invoked for the Colorado Basic Standards and Methodologies for Surface Water. The Colorado Basic Standards for Groundwater would also be waived using an interim measures CERCLA ARAR waiver because the limited RI information available does not indicate that groundwater meeting the regulatory definition exists beneath the mining-related sources addressed by this alternative.

Location- and action-specific ARARs for Alternative A2 would be addressed during implementation of the IRA as indicated in the following paragraphs.

**Excavation:** The excavation of mine wastes from waters of the U.S. is assumed to be performed with neat excavation only involving incidental fallback. Thus, the substantive requirements of Section 404 would not be triggered. If grading or excavation activities result in a discharge of dredge material, the substantive requirements of Nationwide Permit 20 (Response Operations for Oil or Hazardous Substances) would be met.

**Dust Suppression:** Dust suppression and emission-controlled equipment would be used during construction activities for the alternative to achieve compliance with Colorado emission control requirements.

**Dewatering:** If effluent discharge to surface water is necessary during dewatering activities, activities would be conducted in a way to minimize infiltration into the ground surface that could cause additional degradation of groundwater. Because the groundwater, as defined in 5 CCR 1002-41, is not known to be present below the mining-related sources, an interim measures CERCLA ARAR waiver would be invoked. An interim measures CERCLA ARAR waiver would also be invoked to waive the substantive provisions of Colorado Effluent Limitations and Colorado Discharge Permit System (CDPS) regulations for groundwater.

If effluent discharge to surface water is necessary from dewatering activities, the discharge limit requirements of Colorado effluent limitations would be met without treatment at the dewatering locations; otherwise an interim measures CERCLA ARAR waiver would be invoked. Similarly, the substantive provisions of the CDPS regulations would be met; otherwise an interim measures CERCLA ARAR waiver would be invoked.

**Interim Local Waste Management:** Mine wastes at the Site were derived directly or indirectly from the extraction of ore and thus would be exempt from management as a Resource Conservation and Recovery Act (RCRA) hazardous waste (i.e., the Bevill exemption), thus mine wastes would be classified as a non-hazardous solid waste.

Pursuant to the Solid Wastes Disposal Sites and Facilities Act, C.R.S. § 30-20-102(4), mining operations including reclamation activities with approved reclamation plans under a Colorado Mined Land Reclamation Board (MLRB) permit may dispose of solid wastes generated by such operations within the permitted area without obtaining a Certificate of Designation. The CDPHE interprets this provision to exempt CERCLA response actions performed consistently with MLRB regulation 2 CCR 407-1 Rule 3 (Reclamation Performance Standards) to be compliant with Colorado's regulations pertaining to solid waste disposal.

All waste handling and disposal activities under this alternative would be performed in accordance with substantive requirements of the relevant and appropriate subparts of MLRB regulation 2 CCR 407-1 Rule 3 (Reclamation Performance Standards), which would allow the alternative to be compliant with substantive requirements of the Colorado Solid Waste Disposal Sites and Facilities Regulations.

Placement, grading, and backfilling of wastes for interim local management would be performed to meet relevant and appropriate substantive requirements of 2 CCR 407-1 Rule 3.

**Surface Reclamation:** All surface reclamation activities under this alternative, including placement, grading, and backfilling, would be performed to meet relevant and appropriate substantive requirements of 2 CCR 407-1 Rule 3.

**Construction Activities:** Cultural resource surveys have not been completed for all mining-related sources addressed by this alternative. If any cultural resources are found, surveys will be necessary to determine if adverse effects would occur, and if so, how the effects may be minimized or mitigated in accordance with the National Historic Preservation Act, Archaeological and Historic Preservation Act, and Historic Sites Act.

If bald or golden eagles are observed during remedial design and IRA, activities must be modified and conducted to conserve the species and their habitat to comply with the substantive requirements of the Bald and Golden Eagle Protection Act.

If the IRA involves activities modifying streams or water bodies that affect wildlife and/or non-game fish, federal agencies must comply with substantive requirements identified by the U.S. Fish and Wildlife Service (USFWS) and the relevant state agency with jurisdiction over wildlife resources in accordance with Fish and Wildlife Coordination Act and implementing regulations.

If threatened or endangered species are identified at these mining-related sources during remedial design and IRA, activities must be modified and conducted to conserve the species and their habitat in accordance with the Endangered Species Act.

If migratory birds are identified during remedial design and IRA, activities must be modified and conducted to conserve the species and their habitat in accordance with the Migratory Bird Treaty Act.



The alternative would not be conducted within streams. However, if activities were to impact streams, they would be carried out in a manner to avoid adversely affecting wildlife and/or non-game fish within streams. Compliance would be achieved through coordination with the Colorado Division of Parks Wildlife and in accordance with the Colorado Wildlife Enforcement and Penalties Act and Colorado Non-game, Endangered, or Threatened Species Act.

It is not anticipated that nests or dens of wildlife exist at the mine locations. If they were to be encountered, the alternative would be implemented to avoid disturbing or destroying nests or dens. Compliance would be achieved through coordination with the Colorado Division of Parks Wildlife and in accordance with substantive requirements of Colorado Wildlife Commission regulations.

Activities conducted during the IRA on USFS-managed land, such as obtaining borrow material and implementing the IRA at the Brooklyn Mine, would need to comply with the substantive requirements of the San Juan National Forest and Tres Rios Field Office Land and Resource Management Plan.

If the IRA involves activities that affect identified floodplains or wetlands, activities will be carried out in a manner to avoid adversely affecting them and thus meet the substantive requirements of the Clean Water Act, Section 404 regulations and Federal Emergency Management Agency (FEMA) Floodplain Management Regulations. Activities under this alternative would be carried out in a manner that will comply with Colorado Noise Abatement Statue 25-12-103.

Since Alternative A2 could comply with substantive requirements of ARARs or invoke CERCLA ARAR waivers, it was given rating of “will comply, but may require CERCLA ARAR waiver(s).”

### **10.1.3 Long-Term Effectiveness and Permanence**

Alternative A1 fails to provide long-term effectiveness and permanence since no action is taken. Unaddressed obstructed MIW discharges have potential to create unstable impoundments of MIW, sediments, and metal precipitates that could be released to surface water in an uncontrolled manner. This alternative would not reduce generation and migration of MIW and would not reduce releases of COPCs to surface water from interaction of MIW with mining-related sources. Left uncontrolled, mine portal MIW discharges could migrate to surface water and continue to contribute to unacceptable ecological risks. This alternative would not provide stabilization of the mining-related sources and prevent further environmental degradation. Thus, this alternative was given a rating of “none.”

The loading of COPCs is expected to decrease under Alternative A2 because diversion/isolation components addressing the interaction between mine portal MIW discharges and mine wastes reduces leaching and formation of MIW. However, the water quality in the streams, irrespective of the diversion/isolation components, would still be impacted and contribute to unacceptable ecological risks. Residual risks would remain from untreated mine wastes excavated for diversion/isolation components and managed locally at the mining-related sources on an interim basis. Inspection and repair of the diversion/isolation components would be performed as

necessary to maintain their integrity. Long-term effectiveness of diversion/isolation components and interim local management locations would be dependent on BMPs, inspection, and repair, as necessary, to maintain their integrity. Inspection and repair of the diversion/isolation components and interim local waste management locations would be conducted as needed, primarily due to events that could compromise the components (e.g., lack of adherence to ICs, storm events, wildland fires). Periodic monitoring and maintenance of interim management locations would be performed until final disposition of managed waste that would be addressed as part of a future response action. ICs would be implemented to prevent activities that would disturb the integrity of local waste management locations and diversion/isolation components and prevent uses inconsistent with current and reasonably anticipated future land uses

This alternative was given a rating of “moderate,” primarily due to considerations affecting long-term effectiveness and permanence of monitoring and maintaining isolation/diversion components at waste rock piles below mine portal MIW discharges and interim local waste management locations, with monitoring and maintenance as needed.

#### **10.1.4 Reduction of Toxicity, Mobility, or Volume through Treatment**

Alternatives A1 and A2 fail to provide a reduction of toxicity, mobility, or volume through treatment since treatment is not a component of these alternatives. Although gravity dewatering may result in positive benefits to geotechnical stability, it is not considered treatment per this NCP criterion because it does not result in permanent and irreversible reductions in toxicity, mobility, or volume of contamination. Thus, these alternatives were given a rating of “none.”

#### **10.1.5 Short-Term Effectiveness**

No action, would be undertaken under Alternative A1 to address mine portal MIW discharges interacting with mining-related sources. Thus, there are no short-term risks posed to the community, workers, or environment during implementation of this alternative. Thus, this alternative was given a rating of “none.”

Alternative A2 would pose short-term risks to the community and workers related to increased traffic from transporting equipment and borrow material. Driving on access roads that have high centers, rock outcroppings, steep slopes, and lack sufficient width for transporting construction equipment could cause accidents. Safety measures such as signage and flaggers would be implemented to protect workers and the community from increased traffic. Short-term risks to workers could also occur due to work in alpine areas and at the entrance to mine portals, but would be mitigated through safety measures such as personal protective equipment (PPE) (e.g., steel toe boots) and work zones, as well as other safety practices.

There would also be short-term impact to the environment. Short-term increases in contaminant loading could result due to disturbing the mine wastes during excavation, resulting in temporary increases in production of MIW. The excavation of mine wastes or other materials at the entrance to mine portals could cause a release of retained sludge and precipitates just inside the mine portals behind the blockages and temporary surges of higher flows of MIW until re-equilibration. Transporting and placing borrow material has potential environmental impacts from equipment emissions and disturbing borrow locations. Developing borrow areas could

adversely impact the environment. Mitigation measures could include selecting easily accessible borrow locations and reclaiming borrow areas after use.

Alternative A2 was given a rating of “moderate,” primarily due to the moderate quantities of borrow material required and the limited short-term impacts of constructing diversion/isolation components in uncontaminated areas of the mining-related sources. Alternative A2 was given a rating of “moderate,” primarily due to short-term impacts associated with working at mine portals and MIW discharges and the moderate quantities of borrow material required for berm and access road construction that would be transported to mining-related sources for this alternative.

#### **10.1.6 Implementability**

Alternative A1 has no further action taken. Since no remedial action is taken, this alternative was given a rating of “none.”

Alternative A2 includes constructing diversion/isolation components, excavation, dewatering, and interim local management of mine wastes. These are conventional construction practices and can be implemented using available equipment and labor resources. Maintenance and monitoring of diversion/isolation components and interim local waste management areas could prove difficult due to difficult access and constrained locations, especially at alpine and subalpine-category locations with non-conventional access. Uncontaminated borrow material for constructing remedial components and access roads would be generated and transported from within the Site, however borrow location(s) of suitable quantity and quality have not yet been identified. Monitoring and maintenance of ICs is dependent on periodic reviews of the administrative and/or legal instruments used. Maintenance of ICs may be more difficult due to various types of ownership and land use and would require agency coordination.

Alternative A2 was given a rating of “moderate,” primarily due to challenges associated with working at mine portals and MIW discharges and the moderate quantities of borrow material required for berm and access road construction.

#### **10.1.7 Cost**

Present value costs for both alternatives were evaluated over a 15-year period after the base year (Years 0 through 15).

The present value cost for Alternative A1 is \$0. The present value cost for Alternative A2 is \$2,411,000.

### **10.2 COMPARATIVE ANALYSIS OF REMEDIAL ALTERNATIVES FOR MINING-RELATED SOURCE/STORMWATER INTERACTIONS (ALTERNATIVES B1 AND B2)**

#### **10.2.1 Overall Protection of Human Health and the Environment**

Of the two alternatives, the No Action alternative (i.e., Alternative B1) would fail to provide adequate protection of human health and the environment in the short term until a final remedy is

selected and would not achieve RAO 1 (RAOs 2 and 3 are not pertinent to this IRA). This alternative would not provide stabilization of the mining-related sources and prevent further environmental degradation. Unaddressed stormwater interacting with mining-related sources would continue to generate MIW and release particulates containing COPCs to surface water, which contribute to unacceptable ecological risks. Thus, this alternative was given a rating of “not adequate.”

Alternative B2 was given a rating of “adequate” because, it would provide protection of human health and the environment in the short term and is intended to provide adequate protection until a final remedy is selected. This alternative would provide stabilization of the mining-related sources and prevent further environmental degradation. Alternative B2 addresses RAO 1 by constructing and/or maintaining diversion and isolation components to route stormwater around mine portals and/or mine wastes with the potential for interaction and co-mingling at mining-related sources. This would reduce the potential for stormwater to generate additional MIW and reduce transport of particulates containing COPCs to surface water, which contribute to unacceptable ecological risks. Wastes generated from excavating stormwater diversion components such as open channels are assumed to be uncontaminated and do not have handling and management requirements beyond BMPs for erosion and sedimentation. Monitoring and maintenance of the diversion/isolation components would be conducted as needed, primarily due to events that could compromise the components (e.g., lack of adherence to ICs, storm events, wildland fires). EPA would measure the extent by which ecological risks associated with contributions from mining-related source/storm water interactions have been reduced by this alternative. This data would provide information about the effectiveness of the IRA and is intended to help inform future remedial decisions at the Site. ICs would be implemented to prevent activities that would disturb the integrity of diversion/isolation components and prevent uses inconsistent with current and reasonably anticipated future land uses.

### **10.2.2 Compliance with ARARs**

Under Alternative B1, unaddressed stormwater interacting with mining-related sources would continue to release particulates containing COPCs to surface water. Because no action is taken, no chemical-, location-, or action-specific ARARs are triggered. Thus, this alternative was given a rating of “none.”

Chemical-specific ARARs would be pertinent to Alternative B2. State water quality standards would likely not be met for streams receiving stormwater discharges after the alternative is constructed due to other contributing mining-related sources, thus the interim measures CERCLA ARAR waiver would be invoked for the Colorado Basic Standards and Methodologies for Surface Water. The Colorado Basic Standards for Groundwater would also be waived using an interim measures CERCLA ARAR waiver because the limited RI information available does not indicate that groundwater meeting the regulatory definition exists beneath the mining-related sources addressed by this alternative.

Location- and action-specific ARARs for Alternative B2 would be addressed during implementation of the IRA as indicated in the following paragraphs.

**Excavation:** The excavation of mine wastes from waters of the U.S. is assumed to be performed with neat excavation only involving incidental fallback. Thus, the substantive requirements of Section 404 would not be triggered. If grading or excavation activities result in a discharge of dredge material, the substantive requirements of Nationwide Permit 20 (Response Operations for Oil or Hazardous Substances) would be met.

**Dust Suppression:** Dust suppression and emission-controlled equipment would be used during construction activities for the alternative to achieve compliance with Colorado Emission Control requirements.

**Surface Reclamation:** All surface reclamation activities under this alternative, including placement, grading, and backfilling, would be performed to meet relevant and appropriate substantive requirements of 2 CCR 407-1 Rule 3.

**Construction Activities:** Cultural resource surveys have not been completed for all mining-related sources addressed by this alternative. If any cultural resources are found, surveys will be necessary to determine if adverse effects would occur, and if so, how the effects may be minimized or mitigated in accordance with the National Historic Preservation Act, Archaeological and Historic Preservation Act, and Historic Sites Act.

If bald or golden eagles are observed during remedial design and IRA, activities must be modified and conducted to conserve the species and their habitat to comply with the substantive requirements of the Bald and Golden Eagle Protection Act.

If the IRA involves activities modifying streams or water bodies that affect wildlife and/or non-game fish, federal agencies must comply with substantive requirements identified by USFWS and the relevant state agency with jurisdiction over wildlife resources in accordance with Fish and Wildlife Coordination Act and implementing regulations.

If threatened or endangered species are identified at these mining-related sources during remedial design and IRA, activities must be modified and conducted to conserve the species and their habitat in accordance with the Endangered Species Act.

If migratory birds are identified during remedial design and IRA, activities must be modified and conducted to conserve the species and their habitat in accordance with the Migratory Bird Treaty Act.

The alternative would not be conducted within streams. However, if activities were to impact streams, they would be carried out in a manner to avoid adversely affecting wildlife and/or non-game fish within streams. Compliance would be achieved through coordination with the Colorado Division of Parks Wildlife and in accordance with the Colorado Wildlife Enforcement and Penalties Act and Colorado Non-game, Endangered, or Threatened Species Act.

It is not anticipated that nests or dens of wildlife exist at the mine locations. If they were to be encountered, the alternative would be implemented to avoid disturbing or destroying nests or dens. Compliance would be achieved through coordination with the Colorado Division of Parks Wildlife and in accordance with substantive requirements of Colorado Wildlife Commission regulations.

Activities conducted during the IRA on USFS-managed land, such as obtaining borrow material and implementing the IRA at the Brooklyn Mine, would need to comply with the substantive requirements of the San Juan National Forest and Tres Rios Field Office Land and Resource Management Plan.

If the IRA involves activities that affect identified floodplains or wetlands, activities will be carried out in a manner to avoid adversely affecting them and thus meet the substantive requirements of the Clean Water Act, Section 404 regulations and FEMA Floodplain Management Regulations. Activities under this alternative would be carried out in a manner that will comply with Colorado Noise Abatement Statute 25-12-103.

Since Alternative B2 could comply with substantive requirements of ARARs or invoke CERCLA ARAR waivers, it was given rating of “will comply, but may require CERCLA ARAR waiver(s).”

### **10.2.3 Long-Term Effectiveness and Permanence**

Alternative B1 fails to provide long-term effectiveness and permanence since no action is taken. This alternative would not reduce generation and migration of MIW from interaction of stormwater with mining-related sources and would not reduce releases of COPCs to surface water that would continue to contribute to unacceptable ecological risks. This alternative would not provide stabilization of the mining-related sources and prevent further environmental degradation. Thus, this alternative was given a rating of “none.”

The loading of COPCs is expected to decrease under Alternative B2 because diversion/isolation components addressing the interaction between stormwater and mining-related sources reduces leaching and formation of MIW. Routing stormwater around mine portals and/or contaminated mine wastes with the potential for interaction and co-mingling at mining-related sources would reduce the potential for stormwater to generate additional MIW and release particulates containing COPCs to surface water, which contribute to unacceptable ecological risks. However, the water quality in the streams, irrespective of diversion/isolation components for stormwater, would still be impacted and contribute to unacceptable ecological risks. Long-term effectiveness of diversion/isolation components would depend on their integrity. Inspection and repair of the diversion/isolation components would be conducted, as needed, primarily due to events that could compromise the components (e.g., lack of adherence to ICs, storm events, wildland fires). ICs would be implemented to prevent activities that would disturb the integrity of diversion/isolation components and prevent uses inconsistent with current and reasonably anticipated future land uses. This alternative was given a rating of “moderate to high,” primarily due to the long-term effectiveness and permanence of isolation/diversion components in uncontaminated areas of mining-related sources, with monitoring and maintenance as needed.

### **10.2.4 Reduction of Toxicity, Mobility, or Volume through Treatment**

Alternatives B1 and B2 fail to provide a reduction of toxicity, mobility, or volume through treatment since treatment is not a component of these alternatives. Thus, these alternatives were both given a rating of “none.”

### **10.2.5 Short-Term Effectiveness**

No action would be undertaken under Alternative B1 to address stormwater discharges interacting with mining-related sources. Thus, there are no short-term risks posed to the community, workers, or environment during implementation of this alternative. Thus, this alternative was given a rating of “none.”

Alternative B2 would pose short-term risks to the community and workers related to increased traffic. Driving on access roads that have high centers, rock outcroppings, steep slopes, and lack sufficient width for transporting construction equipment could cause accidents. Safety measures such as signage and flaggers would be implemented to protect workers and the community from increased traffic. Short-term risks to workers would be mitigated through safety measures such as PPE (e.g., steel toe boots) and work zones, as well as other safety practices. There would also be short-term impacts to the environment. Transporting and placing borrow material has potential environmental impacts from equipment emissions and disturbing borrow locations. Developing borrow areas could adversely impact the environment. Mitigation measures could include selecting easily accessible borrow locations and reclaiming borrow areas after use.

Alternative B2 was given a rating of “moderate to high,” primarily due to the limited quantities of borrow material required and the limited short-term impacts of constructing diversion/isolation components in uncontaminated areas of the mining-related sources.

### **10.2.6 Implementability**

Alternative B1 has no further action taken. Since no remedial action is taken, this alternative was given a rating of “none.”

Alternative B2 includes constructing diversion/isolation components. These are conventional construction practices and can be implemented using available equipment and labor resources. Maintenance and monitoring of diversion/isolation components could provide difficulties due to difficult access and constrained locations, especially at non-conventional access-alpine and subalpine categories. Uncontaminated borrow material for constructing remedial components and access roads would be generated and transported from within the Site, however borrow location(s) of suitable quantity and quality have not yet been identified. Monitoring and maintenance of ICs is dependent on periodic reviews of the administrative and/or legal instruments used. Maintenance of ICs may be more difficult due to various types of ownership and land use and would require agency coordination.

Alternative B2 was given a rating of “moderate to high,” primarily due to the limited quantities of borrow material required and the relatively simple scope of constructing diversion/isolation components for stormwater in uncontaminated areas.

### **10.2.7 Cost**

Present value costs for both alternatives were evaluated over a 15-year period after the base year (Years 0 through 15).

The present value cost for Alternative B1 is \$0. The present value cost for Alternative B2 is \$1,889,000.

### **10.3 COMPARATIVE ANALYSIS OF REMEDIAL ALTERNATIVES FOR MINE PORTAL POND SEDIMENTS (ALTERNATIVES C1 AND C2)**

#### **10.3.1 Overall Protection of Human Health and the Environment**

Of the two alternatives, the No Action alternative (i.e., Alternative C1) would fail to provide adequate protection of human health and the environment in the short term until a final remedy is selected and would not achieve RAO 1 (RAOs 2 and 3 are not pertinent to this IRA). This alternative would not provide stabilization of the mining-related sources and prevent further environmental degradation. Unaddressed mine portal pond sediments would continue to reduce storage space and residence time for MIW in ponds increasing the likelihood for short circuiting and uncontrolled release of MIW and particulates containing COPCs, which contribute to unacceptable ecological risks. Thus, this alternative was given a rating of “not adequate.”

Alternative C2 was given a rating of “adequate” because, it would provide protection of human health and the environment in a short term and is intended to provide adequate protection until a final remedy is selected. This alternative would provide stabilization of the source and prevent further environmental degradation. Alternative C2 addresses RAO 1 through excavation and interim local waste management of pond sediments that would reduce the potential for uncontrolled releases of particulates containing COPCs to surface water, which contribute to unacceptable ecological risks. Excavation of pond sediments and repair of pond berms would increase storage space for MIW in ponds and minimize short-circuiting of MIW to increase residence time. Excavated mine portal pond sediments would be managed locally at the mining-related source on an interim basis, but residual risks would remain from untreated mine portal pond sediments managed locally. Interim local waste management would include BMPs such as berming, as necessary, to address fugitive dust and potential erosion and sedimentation issues. Long-term effectiveness of interim waste management locations would depend on BMPs, inspection, and repair as necessary to maintain their integrity. Monitoring and maintenance of the interim local waste management locations would be conducted as needed, primarily due to events that could compromise the components (e.g., lack of adherence to ICs, storm events, wildland fires). EPA would measure the extent by which ecological risks associated with contributions from mine portal pond sediments have been reduced by this alternative. This data would provide information about the effectiveness of the IRA and is intended to help inform future remedial decisions at the Site. ICs would be implemented to prevent activities that would disturb the integrity of local waste management locations and prevent uses inconsistent with current and reasonably anticipated future land uses.

#### **10.3.2 Compliance with ARARs**

Under Alternative C1 unaddressed mine portal pond sediments would continue to release particulates containing COPCs to surface water. Because no action is taken, no chemical-, location-, or action-specific ARARs are triggered. Thus, this alternative was given a rating of “none.”



Chemical-specific ARARs would be pertinent to Alternative C2. State water quality standards would not be met for the streams after removal of mine pond portal sediments is complete due to other contributing mining-related sources; thus, the interim measures CERCLA ARAR waiver would be invoked for the Colorado Basic Standards and Methodologies for Surface Water. The Colorado Basic Standards for Groundwater would also be waived using an interim measures CERCLA ARAR waiver because the limited RI information available does not indicate that groundwater meeting the regulatory definition exists beneath the mining-related sources addressed by this alternative.

Location- and action-specific ARARs for Alternative C2 would be addressed during implementation of the IRA, as indicated in the following paragraphs.

**Excavation:** The excavation of mine wastes from waters of the United States is assumed to be performed with neat excavation only involving incidental fallback. Thus, the substantive requirements of Section 404 would not be triggered. If grading or excavation activities result in a discharge of dredge material, the substantive requirements of Nationwide Permit 20 (Response Operations for Oil or Hazardous Substances) would be met.

**Dust Suppression:** Dust suppression and emission-controlled equipment would be used during construction activities for the alternative to achieve compliance with Colorado emission control requirements.

**Dewatering:** If effluent discharge to surface water is necessary during dewatering or pond draining activities, activities would be conducted in a way to minimize infiltration into the ground surface that could cause additional degradation of groundwater. Because the groundwater, as defined in 5 CCR 1002-41, is not known to be present below the mining-related sources, an interim measures CERCLA ARAR waiver would be invoked. An interim measures CERCLA ARAR waiver would also be invoked to waive the substantive provisions of CDPS regulations for groundwater.

If effluent discharge to surface water is necessary during dewatering or pond draining activities, the discharge limit requirements of Colorado effluent limitations would be met without treatment at the dewatering locations; otherwise an interim measures CERCLA ARAR waiver would be invoked. Similarly, the substantive provisions of the CDPS regulations would be met; otherwise an interim measures CERCLA ARAR waiver would be invoked.

**Interim Local Waste Management:** Mine wastes at the Site were derived directly or indirectly from the extraction of ore and thus would be exempt from management as a RCRA hazardous waste (i.e., the Bevill exemption), thus mine wastes would be classified as a non-hazardous solid waste.

Pursuant to the Solid Wastes Disposal Sites and Facilities Act, C.R.S. § 30-20-102(4), mining operations including reclamation activities with approved reclamation plans under an MLRB permit may dispose of solid wastes generated by such operations within the permitted area without obtaining a Certificate of Designation. CDPHE interprets this provision to exempt CERCLA response actions performed consistently with MLRB regulation 2 CCR 407-1 Rule 3

(Reclamation Performance Standards) to be compliant with Colorado's regulations pertaining to solid waste disposal.

All waste handling and disposal activities under this alternative would be performed in accordance with substantive requirements of the relevant and appropriate subparts of MLRB regulation 2 CCR 407-1 Rule 3 (Reclamation Performance Standards), which would allow alternative to be compliant with substantive requirements of the Colorado Solid Waste Disposal Sites and Facilities Regulations.

Placement, grading, and backfilling of wastes for interim local management would be performed to meet relevant and appropriate substantive requirements of 2 CCR 407-1 Rule 3.

**Surface Reclamation:** All surface reclamation activities under this alternative, including placement, grading, and backfilling, would be performed to meet relevant and appropriate substantive requirements of 2 CCR 407-1 Rule 3.

**Construction Activities:** Cultural resource surveys have not been completed for all mining-related sources addressed by this alternative. If any cultural resources are found, surveys will be necessary to determine if adverse effects would occur, and if so, how the effects may be minimized or mitigated in accordance with the National Historic Preservation Act, Archaeological and Historic Preservation Act, and Historic Sites Act.

If bald or golden eagles are observed during remedial design and IRA, activities must be modified and conducted to conserve the species and their habitat to comply with the substantive requirements of the Bald and Golden Eagle Protection Act.

If the IRA involves activities modifying streams or water bodies that affect wildlife and/or non-game fish, federal agencies must comply with substantive requirements identified by USFWS and the relevant state agency with jurisdiction over wildlife resources in accordance with Fish and Wildlife Coordination Act and implementing regulations.

If threatened or endangered species are identified at these mining-related sources during remedial design and IRA, activities must be modified and conducted to conserve the species and their habitat in accordance with the Endangered Species Act.

If migratory birds are identified during remedial design and IRA, activities must be modified and conducted to conserve the species and their habitat in accordance with the Migratory Bird Treaty Act.

The alternative would not be conducted within streams. However, if activities were to impact streams, they would be carried out in a manner to avoid adversely affecting wildlife and/or non-game fish within streams. Compliance would be achieved through coordination with the Colorado Division of Parks Wildlife and in accordance with the Colorado Wildlife Enforcement and Penalties Act and Colorado Non-game, Endangered, or Threatened Species Act.

It is not anticipated that nests or dens of wildlife exist at the mine locations. If they were to be encountered, the alternative would be implemented to avoid disturbing or destroying nests or dens. Compliance would be achieved through coordination with the Colorado Division of Parks

Wildlife and in accordance with substantive requirements of Colorado Wildlife Commission regulations.

Activities conducted during the IRA on USFS-managed land, such as obtaining borrow material and implementing the IRA at the Brooklyn Mine, would need to comply with the substantive requirements of the San Juan National Forest and Tres Rios Field Office Land and Resource Management Plan.

If the IRA involves activities that affect identified floodplains or wetlands, activities will be carried out in a manner to avoid adversely affecting them and thus meet the substantive requirements of the Clean Water Act, Section 404 regulations and FEMA Floodplain Management Regulations. Activities under this alternative would be carried out in a manner that will comply with Colorado Noise Abatement Statute 25-12-103.

Since Alternative C2 could comply with substantive requirements of ARARs or invoke CERCLA ARAR waivers, it was given rating of “will comply, but may require CERCLA ARAR waiver(s).”

### **10.3.3 Long-Term Effectiveness and Permanence**

Alternative C1 fails to provide long-term effectiveness and permanence since no action is taken. Unaddressed sediments would continue to reduce storage space of MIW in mine portal ponds and result in the potential for uncontrolled releases of particulates and/or MIW containing COPCs to surface water, which contribute to unacceptable ecological risks. This alternative would not provide stabilization of the mining-related sources and prevent further environmental degradation. Thus, this alternative was given a rating of “none.”

Excavating mine portal pond sediments and repairing pond berms under Alternative C2 improves the effectiveness of the ponds and reduces the potential for an uncontrolled release of MIW. However, the water quality in the streams, irrespective of the excavated mine portal pond sediments, would still be impacted. Residual risks remain from untreated mine portal pond sediments managed locally at the mining-related source on an interim basis. Long-term effectiveness of interim local waste management locations would depend on BMPs, inspection, and repair, as necessary, to maintain their integrity. ICs would be implemented to prevent activities that would disturb the integrity of local waste management locations and prevent uses inconsistent with current and reasonably anticipated future land uses.

This alternative was given a rating of “moderate,” primarily due to considerations affecting long-term effectiveness and permanence of monitoring and maintaining mine portal ponds below mine portal MIW discharges and interim local waste management locations, with monitoring and maintenance as needed.

### **10.3.4 Reduction of Toxicity, Mobility, or Volume through Treatment**

Alternatives C1 and C2 fail to provide a reduction of toxicity, mobility, or volume through treatment since treatment is not a component of these alternatives. Although gravity dewatering under Alternative C2 may result in positive benefits to geotechnical stability, it is not considered treatment per this NCP criterion because it does not result in permanent and irreversible

reductions in toxicity, mobility, or volume of contamination. Thus, these alternatives were given a rating of “none.”

### **10.3.5 Short-Term Effectiveness**

No action would be undertaken under Alternative C1 to mine portal pond sediments. Thus, there are no short-term risks posed to the community, workers, or environment during implementation of this alternative. Thus, this alternative was given a rating of “none.”

Short-term risk posed to the community and workers under Alternative C2 relate to increased traffic. Driving on access roads that have high centers, rock outcroppings, steep slopes, and lack sufficient width for transporting construction equipment could cause accidents. Safety measures such as signage and flaggers would be implemented to protect workers and community from increased traffic. Short-term risks to workers would be mitigated through safety measures such as PPE (e.g., steel toe boots) and work zones, as well as other safety practices. Short-term risks to workers and the community, and the environment could be mitigated through measures such as water-based dust suppression.

There would also be short-term impacts to the environment. Short-term increases in contaminant loading could result due to disturbing the mine portal pond sediments during excavation, resulting in temporary increases in production of MIW. Transporting and placing borrow material has potential environmental impacts from equipment emissions and disturbing borrow locations. Developing borrow areas could adversely impact the environment. Mitigation measures could include selecting easily accessible borrow locations and reclaiming borrow areas after use.

Alternative C2 was given a rating of “moderate to high,” primarily due to the limited quantities of borrow material required and the limited short-term impacts from excavating mine portal pond sediments.

### **10.3.6 Implementability**

Alternative C1 has no further action taken, this alternative was given a rating of “none.”

Alternative C2 includes excavation, dewatering, and interim local waste management of mine portal pond sediments. These are conventional construction practices and can be implemented using available equipment and labor resources. Maintenance and monitoring of interim local waste management areas could prove difficult due to access and constrained mining-related categories, especially at alpine and subalpine-category locations with non-conventional access. Uncontaminated borrow material for constructing pond and interim local waste management location berms and access roads would be generated and transported from within the Site, however borrow location(s) of suitable quantity and quality have not yet been identified. Monitoring and maintenance of ICs is dependent on periodic reviews of the administrative and/or legal instruments used. Maintenance of ICs may be more difficult due to various types of ownership and land use and would require agency coordination.

Alternative C2 was given a rating of “moderate,” primarily due to challenges associated with working with MIW discharges to ponds and moderate quantities of borrow material required for berms and access road construction.

### **10.3.7 Cost**

Present value costs for both alternatives were evaluated over a 15-year period after the base year (Years 0 through 15).

The present value cost for Alternative C1 is \$0. The present value cost for Alternative C2 is \$3,384,000.

## **10.4 COMPARATIVE ANALYSIS OF REMEDIAL ALTERNATIVES FOR IN-STREAM MINE WASTES (ALTERNATIVES D1 AND D2)**

### **10.4.1 Overall Protection of Human Health and the Environment**

Of the two alternatives, the No Action alternative (i.e., Alternative D1) would fail to provide adequate protection of human health and the environment in the short term until a final remedy is selected and would not achieve RAO 1 (RAOs 2 and 3 are not pertinent to this IRA). This alternative would not provide stabilization of the mining-related sources and prevent further environmental degradation. Unaddressed in-stream mine wastes would continue to impede stream flow, increasing the potential for erosion or mass movement of contamination in particulate form and/or leaching of contaminants from mine wastes. Unaddressed in-stream mine wastes could result in migration of particulates and/or MIW containing COPCs to surface water especially during periods of precipitation and snowmelt, which contribute to unacceptable ecological risks. Thus, this alternative was given a rating of “not adequate.”

Alternative D2 was given a rating of “adequate” because, it would provide protection of human health and the environment in a short term and is intended to provide adequate protection until a final remedy is selected. This alternative would provide stabilization of the mining-related sources and prevent further environmental degradation. Alternative D2 achieves RAO 1 by excavating in-stream mine wastes that impede flow or are susceptible to erosion or leaching of contaminants and formation of MIW and reduces transport of particulates containing COPCs to surface water, which contribute to unacceptable ecological risks. Excavated in-stream mine wastes would be managed locally at the mining-related sources on an interim basis. Interim local waste management would include BMPs such as berming, as necessary, to address fugitive dust and potential erosion and sedimentation issues but residual risks would remain from untreated in-stream mine wastes managed locally. Monitoring and maintenance of the interim local waste management locations would be conducted as needed, primarily due to events that could compromise the components (e.g., lack of adherence to ICs, storm events, wildland fires). Maintenance would be performed as necessary to maintain the integrity of interim management location components. EPA would measure the extent by which ecological risks associated with contributions from in-stream mine waste have been reduced by this alternative. This data would provide information about the effectiveness of the IRA and is intended to help inform future remedial decisions at the Site. ICs would be implemented to prevent activities that would disturb the integrity of local waste management locations and prevent uses inconsistent with current and reasonably anticipated future land uses.

### 10.4.2 Compliance with ARARs

Unaddressed in-stream mine wastes under Alternative D1 would continue to release particulates containing COPCs to surface water. Because no action is taken, no chemical-, location-, or action-specific ARARs are triggered. Thus, this alternative was given a rating of “none.”

Chemical-specific ARARs would be pertinent to Alternative D2. State water quality standards would likely not be met for streams after removal of in-stream mine wastes due to other contributing mining-related sources, thus the interim measures CERCLA ARAR waiver would be invoked for the Colorado Basic Standards and Methodologies for Surface Water. The Colorado Basic Standards for Groundwater would also be waived using an interim measures CERCLA ARAR waiver because the limited RI information available does not indicate that groundwater meeting the regulatory definition exists beneath the mining-related sources addressed by this alternative.

Location- and action-specific ARARs for Alternative D2 would be addressed during implementation of the IRA as indicated in the following paragraphs.

**Excavation:** The excavation of mine wastes from waters of the United States is assumed to be performed with neat excavation only involving incidental fallback. Thus, the substantive requirements of Section 404 would not be triggered. If grading or excavation activities result in a discharge of dredge material, the substantive requirements of Nationwide Permit 20 (Response Operations for Oil or Hazardous Substances) would be met.

**Dust Suppression:** Dust suppression and emission-controlled equipment would be used during construction activities for the alternative to achieve compliance with Colorado Emission Control requirements.

**Dewatering:** If effluent discharge to surface water is necessary during dewatering activities, activities would be conducted in a way to minimize infiltration into the ground surface that could cause additional degradation of groundwater. Because the groundwater, as defined in 5 CCR 1002-41, is not known to be present below the mining-related sources, an interim measures CERCLA ARAR waiver would be invoked. An interim measures CERCLA ARAR waiver would also be invoked to waive the substantive provisions of Colorado Effluent Limitations and CDPS regulations for groundwater.

If effluent discharge to surface water is necessary during dewatering activities,, the discharge limit requirements of Colorado Effluent Limitations would be met without treatment at the dewatering locations; otherwise an interim measures CERCLA ARAR waiver would be invoked. Similarly, the substantive provisions of the CDPS regulations would be met; otherwise an interim measures CERCLA ARAR waiver would be invoked.

**Interim Local Waste Management:** Mine wastes at the Site were derived directly or indirectly from the extraction of ore and thus would be exempt from management as a RCRA hazardous waste (i.e., the Bevill exemption), thus mine wastes would be classified as a non-hazardous solid waste.

Pursuant to the Solid Wastes Disposal Sites and Facilities Act, C.R.S. § 30-20-102(4), mining operations including reclamation activities with approved reclamation plans under an MLRB permit may dispose of solid wastes generated by such operations within the permitted area without obtaining a Certificate of Designation. CDPHE interprets this provision to exempt CERCLA response actions performed consistently with MLRB regulation 2 CCR 407-1 Rule 3 (Reclamation Performance Standards) to be compliant with Colorado's regulations pertaining to solid waste disposal.

All waste handling and disposal activities under this alternative would be performed in accordance with substantive requirements of the relevant and appropriate subparts of MLRB regulation 2 CCR 407-1 Rule 3 (Reclamation Performance Standards), which would allow the alternative to be compliant with substantive requirements of the Colorado Solid Waste Disposal Sites and Facilities Regulations.

Placement, grading, and backfilling of wastes for interim local management would be performed to meet relevant and appropriate substantive requirements of 2 CCR 407-1 Rule 3.

**Surface Reclamation:** All surface reclamation activities under this alternative, including placement, grading, and backfilling, would be performed to meet relevant and appropriate substantive requirements of 2 CCR 407-1 Rule 3.

**Construction Activities:** Cultural resource surveys have not been completed for all mining-related sources addressed by this alternative. If any cultural resources are found, surveys will be necessary to determine if adverse effects would occur, and if so, how the effects may be minimized or mitigated in accordance with the National Historic Preservation Act, Archaeological and Historic Preservation Act, and Historic Sites Act.

If bald or golden eagles are observed during remedial design and IRA, activities must be modified and conducted to conserve the species and their habitat to comply with the substantive requirements of the Bald and Golden Eagle Protection Act.

If the IRA involves activities modifying streams or water bodies that affect wildlife and/or non-game fish, federal agencies must comply with substantive requirements identified by USFWS and the relevant state agency with jurisdiction over wildlife resources in accordance with Fish and Wildlife Coordination Act and implementing regulations.

If threatened or endangered species are identified at these mining-related sources during remedial design and IRA, activities must be modified and conducted to conserve the species and their habitat in accordance with the Endangered Species Act.

If migratory birds are identified during remedial design and IRA, activities must be modified and conducted to conserve the species and their habitat in accordance with the Migratory Bird Treaty Act.

If activities were to impact streams, they would be carried out in a manner to avoid adversely affecting wildlife and/or non-game fish within streams. Compliance would be achieved through coordination with the Colorado Division of Parks Wildlife and in accordance with the Colorado

Wildlife Enforcement and Penalties Act and Colorado Non-game, Endangered, or Threatened Species Act.

It is not anticipated that nests or dens of wildlife exist at the mine locations. If they were to be encountered, the alternative would be implemented to avoid disturbing or destroying nests or dens. Compliance would be achieved through coordination with the Colorado Division of Parks Wildlife and in accordance with substantive requirements of Colorado Wildlife Commission regulations.

Activities conducted during the IRA on USFS-managed land, such as obtaining borrow material, would need to comply with the substantive requirements of the San Juan National Forest and Tres Rios Field Office Land and Resource Management Plan.

If the IRA involves activities that affect identified floodplains or wetlands, activities will be carried out in a manner to avoid adversely affecting them and thus meet the substantive requirements of the Clean Water Act, Section 404 regulations and FEMA Floodplain Management Regulations. Activities under this alternative would be carried out in a manner that will comply with Colorado Noise Abatement Statute 25-12-103.

Since Alternative D2 could comply with substantive requirements of ARARs or invoke CERCLA ARAR waivers, it was given rating of “will comply, but may require CERCLA ARAR waiver(s).”

#### **10.4.3 Long-Term Effectiveness and Permanence**

Alternative D1 fails to provide long-term effectiveness and permanence since no action is taken. Unaddressed in-stream mine wastes would continue to have the potential for erosion and result in the potential for releases of particulates and/or MIW containing COPCs to surface water, which contribute to unacceptable ecological risks. This alternative would not provide stabilization of the mining-related sources and prevent further environmental degradation. Thus, this alternative was given a rating of “none.”

The loading of COPCs is expected to decrease through removing in-stream mine wastes under Alternative D2 because excavation and interim local waste management reduces the contact of the water with the mine waste and thereby reduces leaching and formation of MIW and erosion and transport of particulates containing COPCs to surface water, which contribute to unacceptable ecological risks. However, the water quality in the streams, irrespective of the excavated mine wastes, would still be impacted. Residual risks remain from untreated waste managed locally at the mining-related source on an interim basis. Long-term effectiveness of interim local management locations would depend on BMPs, inspection, and repair, as necessary, to maintain their integrity. ICs would be implemented to prevent activities that would disturb the integrity of local waste management locations and prevent uses inconsistent with current and reasonably anticipated future land uses.

This alternative was given a rating of “moderate to high,” primarily because excavated wastes would no longer be present in streams and would be managed in interim local waste management locations that could be monitored and maintained as needed.



#### **10.4.4 Reduction of Toxicity, Mobility, or Volume through Treatment**

Alternatives D1 and D2 fail to provide a reduction of toxicity, mobility, or volume through treatment since treatment is not a component of these alternatives. Although gravity dewatering under Alternative D2 may result in positive benefits to geotechnical stability, it is not considered treatment per this NCP criterion because it does not result in permanent and irreversible reductions in toxicity, mobility, or volume of contamination. Thus, these alternatives were given a rating of “none.”

#### **10.4.5 Short-Term Effectiveness**

No action would be undertaken under Alternative D1 for in-stream mine wastes. Thus, there are no short-term risks posed to the community, workers, or environment during implementation of this alternative. Thus, this alternative was given a rating of “none.”

Short-term risk posed to the community and workers under Alternative D2 relate to increased traffic. Driving on access roads that have high centers, rock outcroppings, steep slopes, and lack sufficient width for transporting construction equipment could cause accidents. Safety measures such as signage and flaggers would be implemented to protect workers and community from increased traffic. Short-term risks to workers would be mitigated through safety measures such as PPE (e.g., steel toe boots) and work zones, as well as other safety practices.

There would also be short-term impacts to the environment. Short-term increases in contaminant loading could result due to disturbing the in-stream mine wastes during excavation, resulting in temporary increases in production of MIW. Transporting and placing borrow material would have potential environmental impacts from equipment emissions and disturbing borrow locations. Developing borrow areas could adversely impact the environment. Mitigation measures could include selecting easily accessible borrow locations and reclaiming borrow areas after use. Alternative D2 was given a rating of “moderate to high,” primarily due to the limited quantities of borrow material required and the limited short-term impacts of excavating in-stream mine wastes.

#### **10.4.6 Implementability**

Alternative D1 has no further action taken. Since no remedial action is taken, this alternative was given a rating of “none.”

Alternative D2 includes excavation, dewatering, and interim local waste management of in-stream mine waste. These are conventional construction practices and can be implemented using available equipment and labor resources. Maintenance and monitoring of interim local waste management areas could prove difficult due to access and constrained mining-related categories, especially at alpine and subalpine-category locations with non-conventional access.

Uncontaminated borrow material for constructing remedial components and access roads would be generated and transported from within the Site, however borrow location(s) of suitable quantity and quality have not yet been identified. Monitoring and maintenance of ICs is dependent on periodic reviews of the administrative and/or legal instruments used. Maintenance of ICs may be more difficult due to various types of ownership and land use and would require agency coordination.

Alternative D2 was given a rating of “moderate,” primarily due to the challenges of excavating and dewatering in-stream mine wastes.

#### **10.4.7 Cost**

Present value costs for both alternatives were evaluated over a 15-year period after the base year (Years 0 through 15).

The present value cost for Alternative D1 is \$0. The present value cost for Alternative D2 is \$624,000.

### **10.5 COMPARATIVE ANALYSIS OF REMEDIAL ALTERNATIVES FOR MINING-IMPACTED RECREATION STAGING AREAS (ALTERNATIVES E1 AND E2)**

#### **10.5.1 Overall Protection of Human Health and the Environment**

Of the two alternatives, the No Action alternative (i.e., Alternative E1) would fail to provide protection of human health and the environment in the short term until a final remedy is selected. This alternative would not provide stabilization of the mining-related sources and prevent further environmental degradation. Unaddressed mining-impacted recreation staging areas would not achieve RAOs 2 and 3 (RAO 1 is not pertinent to this IRA) since no action would be taken to prevent human exposure through ingestion and inhalation to mine wastes and contaminated soils containing lead and through ingestion to mine wastes and contaminated soils containing arsenic that exceed risk-based levels during camping at recreation staging activities. Thus, this alternative was given a rating of “not adequate.”

Alternative E2 was given a rating of “adequate.” Alternative E2 would provide protection of human health and the environment in the short term until a final remedy is selected. This alternative would provide stabilization of the mining-related sources at recreation staging areas, prevent further environmental degradation, and achieve significant risk reduction quickly. Alternative E2 addresses RAOs 2 and 3 by containing/isolating mine wastes and contaminated soils within mining-impacted recreation staging areas. Combinations of aggregate and soil covers would be implemented to reduce disturbances of mine wastes and contaminated soils, and migration of contaminants. The covers would provide an exposure barrier and eliminate surface exposure to mine waste and contaminated soils. The covers would be sloped to promote positive drainage in order to minimize erosion and to reduce infiltration that could saturate the subsurface and compromise the integrity of the covers. The covers used for containment/isolation of mine wastes and contaminated soils could be breached if disturbed, resulting in potential COPC exposures to campers. Long-term effectiveness of covers would depend on inspection and repair, as necessary, to maintain their integrity. ICs would be implemented to prevent activities that would disturb the integrity of the covers and prevent uses inconsistent with current and reasonably anticipated future land uses. Monitoring and maintenance of the covers would be conducted as needed, primarily due to events that could compromise the components (e.g., lack of adherence to ICs, storm events, wildland fires). Maintenance would be performed as necessary to maintain the integrity of covers.

### 10.5.2 Compliance with ARARs

Under Alternative E1, unaddressed mine wastes and contaminated soils at mining-impacted recreation staging areas would continue to pose unacceptable risks to human health. Because no action is taken, no chemical-, location-, or action-specific ARARs are triggered. Thus, this alternative was given a rating of “none.”

Chemical-specific ARARs would be pertinent to Alternative E2. State water quality standards would likely not be met for streams after the capping of recreation use areas due to other contributing mining-related sources, thus the interim measures CERCLA ARAR waiver would be invoked for the Colorado Basic Standards and Methodologies for Surface Water. The Colorado Basic Standards for Groundwater would also be waived using an interim measures CERCLA ARAR waiver because the limited RI information available does not indicate that groundwater meeting the regulatory definition exists beneath the mining-related sources addressed by this alternative.

Location- and action-specific ARARs for Alternative E2 would be addressed during implementation of the IRA as indicated in the following paragraphs.

**Cover Placement:** The placement and grading of covers is assumed to be performed without the discharge of dredged or fill materials into the waters of the United States. Thus, the substantive requirements of Section 404 would not be triggered. If grading activities result in a discharge of dredge material, the substantive requirements of Nationwide Permit 20 (Response Operations for Oil or Hazardous Substances) would be met. All cover placement activities would be conducted in a way minimize infiltration, if present, into the ground surface that could cause additional degradation of groundwater. Because the groundwater, as defined in 5 CCR 1002-41, is not known to be present below the mining-related sources, an interim measures CERCLA ARAR waiver would be invoked. An interim measures CERCLA ARAR waiver would also be invoked to waive the substantive provisions of Colorado Effluent Limitations and CDPS regulations for groundwater. For channelized stormwater discharges from covers, the substantive provisions of the CDPS program would be met; otherwise an interim measures CERCLA ARAR waiver would be invoked. During construction of the covers, the discharge limit requirements of Colorado effluent limitations would be met without treatment; otherwise an interim measures CERCLA ARAR waiver would be invoked.

**Surface Reclamation:** All surface reclamation activities under this alternative, including placement, grading, and backfilling, would be performed to meet relevant and appropriate substantive requirements of 2 CCR 407-1 Rule 3. During construction and seeding of covers, compliance would be achieved through completion of noxious weed surveys and coordination with the Colorado Division of Parks Wildlife and in accordance with Colorado Noxious Weed Act and the San Juan County Noxious Weed regulations.

**Dust Suppression:** Dust suppression and emission-controlled equipment will be used during construction activities for this alternative to achieve compliance with Colorado Emission Control regulations.

**Construction Activities:** Cultural resource surveys have not been completed for all mining-related sources addressed by this alternative. If any cultural resources are found, surveys will be necessary to determine if adverse effects would occur, and if so, how the effects may be minimized or mitigated in accordance with the National Historic Preservation Act, Archaeological and Historic Preservation Act, and Historic Sites Act.

If bald or golden eagles are observed during remedial design and IRA, activities must be modified and conducted to conserve the species and their habitat to comply with the substantive requirements of the Bald and Golden Eagle Protection Act.

If the IRA involves activities modifying streams or water bodies that affect wildlife and/or non-game fish, federal agencies must comply with substantive requirements identified by USFWS and the relevant state agency with jurisdiction over wildlife resources in accordance with Fish and Wildlife Coordination Act and implementing regulations.

If threatened or endangered species are identified at these mining-related sources during remedial design and IRA, activities must be modified and conducted to conserve the species and their habitat in accordance with the Endangered Species Act.

If migratory birds are identified during remedial design and IRA, activities must be modified and conducted to conserve the species and their habitat in accordance with the Migratory Bird Treaty Act.

The alternative would not be conducted within streams. However, if activities were to impact streams, they would be carried out in a manner to avoid adversely affecting wildlife and/or non-game fish within streams. Compliance would be achieved through coordination with the Colorado Division of Parks Wildlife and in accordance with the Colorado Wildlife Enforcement and Penalties Act and Colorado Non-game, Endangered, or Threatened Species Act.

It is not anticipated that nests or dens of wildlife exist at the mine locations. If they were to be encountered, the alternative would be implemented to avoid disturbing or destroying nests or dens. Compliance would be achieved through coordination with the Colorado Division of Parks Wildlife and in accordance with substantive requirements of Colorado Wildlife Commission regulations.

Activities conducted during the IRA on USFS-managed land, such as obtaining borrow material, would need to comply with the substantive requirements of the San Juan National Forest and Tres Rios Field Office Land and Resource Management Plan.

If the alternative involves activities that affect identified floodplains or wetlands, activities will be carried out in a manner to avoid adversely affecting them and thus meet the substantive requirements of the Clean Water Act, Section 404 regulations and FEMA Floodplain Management Regulations. Activities under this alternative would be carried out in a manner that will comply with Colorado Noise Abatement Statute 25-12-103.

Since Alternative E2 could comply with substantive requirements of ARARs or invoke CERCLA ARAR waivers, be waived, it was given rating of “will comply, but may require CERCLA ARAR waiver(s).”

### **10.5.3 Long-Term Effectiveness and Permanence**

Alternative E1 fails to provide long-term effectiveness and permanence since no action is taken. Unaddressed mine waste and contaminated soils at mining-impacted recreation staging areas could result in potential adverse lead and arsenic exposures to humans during camping. This alternative would not provide stabilization of the mining-related sources and prevent further environmental degradation. Thus, this alternative was given a rating of “none.”

Under Alternative E2, exposures to mine wastes and contaminated soils containing lead or arsenic that exceed risk-based levels are reduced through covers installed over recreation staging areas. However, the mine wastes and contaminated soils posing unacceptable human health risks would be left in place under the covers. The covers used for containing/isolating mine wastes and contaminated soils could be breached resulting in potential lead and arsenic exposures to campers if disturbed. The covers would be sloped to promote positive drainage that minimizes erosion and to reduces infiltration that could saturate the subsurface and compromise the integrity of the covers. ICs would be implemented to prevent activities that would disturb the integrity of the covers and prevent uses inconsistent with current and reasonably anticipated future land uses. Long-term effectiveness of covers would depend on BMPs, inspection, and repair, as necessary, to maintain their integrity. Thus, this alternative was given a rating of “moderate to high,” primarily due to the long-term effectiveness and permanence of covers, with monitoring and maintenance as needed.

### **10.5.4 Reduction of Toxicity, Mobility, or Volume through Treatment**

Alternatives E1 and E2 fail to provide a reduction of toxicity, mobility, or volume through treatment since treatment is not a component of these alternatives. Thus, both alternatives were given a rating of “none.”

### **10.5.5 Short-Term Effectiveness**

No action, would be taken under Alternative E1 to mining-impacted recreation staging areas. Thus, there are no short-term risks posed to the community, workers, or environment during implementation of this alternative. Thus, this alternative was given a rating of “none.”

Alternative E2 poses short-term risks to the community and workers related to increased traffic. Driving on access roads that have high centers, rock outcroppings, steep slopes, and lack sufficient width for transporting construction equipment could cause accidents. Safety measures such as signage and flaggers would be implemented to protect workers and community from increased traffic. Short-term risks to workers would be mitigated through safety measures such as PPE (e.g., steel toe boots) and work zones, as well as other safety practices. Alternative E2 would involve disturbing mine wastes and contaminated soils, which could pose potential adverse impacts through dispersion of dust. Short-term risks to workers, the community, and the environment could be mitigated through measures such as water- or chemical- based suppression for controlling dust during construction.

There would also be short-term impacts to the environment. Transporting and placing borrow material has potential environmental impacts from equipment emissions and disturbing borrow locations. Developing borrow areas could adversely impact the environment. Mitigation

measures could include selecting easily accessible borrow locations and reclaiming borrow areas after use.

Thus, Alternative E2 was given a rating of “moderate,” primarily due to the significant quantities of borrow material required and the short-term impacts associated with developing and transporting borrow material for constructing covers.

#### **10.5.6 Implementability**

Alternative E1 has no further action taken. Since no remedial action is taken, this alternative was given a rating of “none.”

Alternative E2 involves cover placement. This is a conventional construction practice and can be implemented using available equipment and labor resources. Uncontaminated borrow material for constructing covers and access roads would be generated and transported from within the Site, however borrow location(s) of suitable quantity and quality have not yet been identified. Monitoring and maintenance of ICs is dependent on periodic reviews of the administrative and/or legal instruments used. Maintenance of ICs may be more difficult due to various types of ownership and land use and would require agency coordination.

Thus, Alternative E2 was given a rating of “moderate,” primarily due to the significant quantities of borrow material required for cover construction.

#### **10.5.7 Cost**

Present value costs for both alternatives were evaluated over a 15-year period after the base year (Years 0 through 15).

The present value cost for Alternative E1 is \$0. The present value cost for Alternative E2 is \$1,668,000.

Exhibit 10-1 Summary of Comparative Analysis for Remedial Alternatives

Remedial Alternative	Threshold Criteria		Balancing Criteria				
	Overall Protection of Human Health and the Environment	Compliance with ARARs	Long-Term Effectiveness and Permanence	Reduction of Toxicity, Mobility, or Volume through Treatment	Short-Term Effectiveness	Implementability	Present Value Cost (Dollars) <sup>1</sup>
Mine Portal MIW Discharges Alternatives							
Alternative A1 – No Action <sup>2</sup>	Not Adequate	None	None	None	None	None	\$0
Alternative A2 – Diversion/Isolation	Adequate	Will comply, but may require CERCLA ARAR waiver(s)	Moderate	None	Moderate	Moderate	\$2,411,000
Mining-Related Source/Stormwater Interactions Alternatives							
Alternative B1 – No Action <sup>2</sup>	Not Adequate	None	None	None	None	None	\$0
Alternative B2 – Stormwater Diversion/Isolation	Adequate	Will comply, but may require CERCLA ARAR waiver(s)	Moderate to High	None	Moderate to High	Moderate to High	\$1,889,000
Mine Portal Pond Sediments Alternatives							
Alternative C1 – No Action <sup>2</sup>	Not Adequate	None	None	None	None	None	\$0
Alternative C2 – Excavation and Interim Local Waste Management	Adequate	Will comply, but may require CERCLA ARAR waiver(s)	Moderate	None	Moderate to High	Moderate	\$3,384,000
In-Stream Mine Wastes Alternatives							
Alternative D1 – No Action <sup>2</sup>	Not Adequate	None	None	None	None	None	\$0
Alternative D2 – Excavation and Interim Local Waste Management	Adequate	Will comply, but may require CERCLA ARAR waiver(s)	Moderate to High	None	Moderate to High	Moderate	\$624,000
Mining-Impacted Recreation Staging Areas Alternatives							
Alternative E1 – No Action <sup>2</sup>	Not Adequate	None	None	None	None	None	\$0
Alternative E2 – Containment/Isolation	Adequate	Will comply, but may require CERCLA ARAR waiver(s)	Moderate to High	None	Moderate	Moderate	\$1,668,000

- Notes:
1. Present value costs and quantitative ratings are subject to change. Detailed cost spreadsheets (cost summaries, present value analyses, and cost worksheets) for each alternative are presented in Appendix F of the FFS (CDM Smith 2018).
  2. Alternatives A1, B1, C1, D1, and E1 represent the No Action alternatives required by the NCP.

Legend for Qualitative Ratings System:

Threshold Criteria

(Overall Protection of Human Health and the Environment)

Not Adequate  
Adequate

Threshold Criteria (Compliance with ARARs)

None  
Will comply  
Will comply, but may require CERCLA ARAR waiver(s)

Balancing Criteria (Excluding Cost)

None  
Low  
Low to Moderate  
Moderate  
Moderate to High  
High

## **10.6 MODIFYING CRITERIA**

### **10.6.1 State Acceptance**

State (support agency) acceptance is a modifying criterion under the NCP. Assessment of the state acceptance was completed after comments on the proposed plan were submitted to EPA during the formal comment period. Thus, state acceptance was not considered in the detailed analysis of alternatives presented in the FFS.

Part 3 of this IROD provides discussion of the input provided by the state during the formal comment period.

### **10.6.2 Community Acceptance**

Community acceptance is also a modifying criterion under the NCP. Community assessment was completed after EPA received public comments on the proposed plan during the public commenting period. Thus, community acceptance was not considered in the detailed analysis of alternatives presented in the FFS.

Part 3 of this IROD provides discussion of the community acceptance, including responses to comments provided by members of the community during the formal comment period.

### **10.6.3 Modifications Made as a Result of Comments**

Comments from the CDPHE and the general public were addressed through clarification and explanation. These can be found in Part 3 of this document, the responsiveness summary. Based on these written and oral comments, EPA has not made any significant changes to the original proposal but has provided clarifying information in this IROD based on the comments.



## 11.0 PRINCIPAL THREAT WASTES

Principal threat wastes are source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present significant risk to human health or the environment should exposure occur. Low-level threat wastes are those source materials that generally can be reliably contained and would present only a low risk in the event of release. Source materials are materials that include or contain hazardous substances, pollutants, or contaminants that act as a reservoir for migration of contamination to groundwater, surface water, or air or act as a source for direct exposure.

Based on those definitions, solid media at the mining-related sources that contain contaminants above their respective remedial criteria constitute source materials because they act as a reservoir for migration of contamination to groundwater and surface water. Solid media, such as mine waste, sediment, and contaminated soil, are source materials for MIW generation.

Solid media, including mine waste, sediment, and contaminated soil, at the mining-related sources addressed by interim measures are not considered principal threat waste for the following reasons:

- Contaminants in solid media are not highly toxic.
  - The contaminants present are not in forms or at concentrations that would result in designation of characteristic hazardous waste due to toxicity (i.e., through the toxicity characteristic leaching procedure) if it were otherwise not exempt from regulation under RCRA by the Beville amendment.
- Contaminants in solid media are not highly mobile.
  - The contaminants present at this Site are inorganics that are generally bound as part of mineral assemblages within the solid media and are only mobile when in contact with acidic water over time.
- Contaminants in solid media can be reliably contained.
  - The contaminants present at this Site are inorganics generally bound as part of mineral assemblages within the solid media. Solid mine materials are particularly amenable to containment strategies that also isolate the contaminants with water, resulting in leaching and migration.

Solid media at the mining-related sources addressed by this IROD are thus considered a low-level threat waste. Additional discussion in Section 14.0 describes the NCP statutory preference for treatment of principal threat waste and subsequent exclusion of treatment as a principal element of the remedy.

## **12.0 SELECTED INTERIM REMEDY**

Based on consideration of the CERCLA requirements, the detailed analysis of remedial alternatives, state comments, and all public comments (see Part 3, Responsiveness Summary), EPA has determined that the preferred remedial alternatives for the IRAs presented in the proposed plan for the Site-wide cleanup is the appropriate remedy for the Site. The selected interim remedy consists of Alternative A2: Diversion/Isolation, Alternative B2: Stormwater Diversion/Isolation, Alternative C2: Excavation and Interim Local Waste Management, Alternative D2: Excavation and Interim Local Waste Management, Alternative E2: Containment/Isolation, with minor modifications as described in this section.

Minor modifications to the information presented in the proposed plan, as described in this section, were implemented based on comments provided during the formal comment period as well as additional information gathered following the release of the proposed plan. These minor modifications include:

- The number of mining-related sources identified for IRAs was reduced from 26 to 23 due to the three other mining-related sources being completed under other authority in a future action.
- ARARs pertaining to the selected interim remedy, including the use of the CERCLA interim measures waiver for specific ARARs, were clarified. A summary of federal and state ARARs for the selected interim remedy is attached as Appendix C.
- As described in Section 7.1.3, an alternate trespass camping scenario was evaluated in response to comments received during the public comment period for the proposed plan.

As a result of these modifications, the quantities and costs associated with the preferred alternatives presented in the proposed plan (and Section 9.0) have been updated in the following subsections.

The selected interim remedy will target specific contaminant migration issues from mining-related sources (including campgrounds) for interim remediation. The final remedial decisions for these mining-related sources will be made in a final record of decision.

The following subsections provide the rationale, detailed description, estimated costs, and expected outcome for each IRA of the selected interim remedy.

### **12.1 MINE PORTAL MIW DISCHARGES**

#### **12.1.1 Short Description of the Selected Interim Remedy**

The mine portal MIW discharges selected interim remedy involves construction of diversion and isolation components to route mine portal MIW discharge around contaminated mine waste with the potential for interaction and co-mingling at mining-related sources. It would also include maintenance of previously existing and newly constructed diversion and isolation components.

### **12.1.2 Rationale for the Selected Interim Remedy**

The mine portal MIW discharges selected interim remedy reduces the potential for uncontrolled releases of particulates and MIW from sediment in mine portal ponds that contribute to unacceptable ecological risks. The mine portal MIW discharges selected interim remedy will achieve RAO 1 by routing mine portal MIW discharge around contaminated mine waste with the potential for interaction and co-mingling at mining-related sources. RAOs 2 and 3 are not pertinent to this IRA.

### **12.1.3 Detailed Description of the Selected Interim Remedy**

Diversion or isolation components implemented at each mining-related source will be chosen on a location-by-location basis. Open channels typically will be constructed to collect mine portal MIW discharge and divert it around the existing mine waste. The construction of berms immediately upgradient of mine waste, collection/diversion piping or liners, or a combination of multiple types of components are also viable for locations that are not conducive to open-channel diversion. Berms will be considered at locations with underlying rock surfaces, while collection/diversion piping or liners will be considered at locations with steep slopes or other features that pose challenges, such as roads directly adjacent to proposed diversion/isolation components. These assumptions will be refined at the time of remedial design using location-specific information. At mining-related sources with existing MIW diversion or isolation components, repairs will be conducted to improve the conditions of those components.

In addition to mine wastes excavated for open-channel diversion, mine wastes or other materials at the entrance to a mine portal that are partially obstructing the free flow of mine portal MIW discharge will be excavated. During the excavation process, the excavated wastes will be placed at the mining-related source for gravity dewatering as needed. The location for this activity is assumed to be amenable to dewatering without the need for liners or other isolation measures. Additional dewatering could be implemented for saturated materials through ex situ amendment with a dewatering agent, as necessary, for handling and geotechnical stability prior to interim management at the mining-related source. Physical characterization such as analysis of geotechnical parameters will be conducted, as needed, on excavated and dewatered mine waste to evaluate physical stability. All dewatering activities will be conducted in a way to minimize infiltration into the ground surfaces. Excavated wastes will be managed locally at the mining-related source on an interim basis. Interim local waste management will include BMPs such as berming, as necessary, to address fugitive dust and potential erosion and sedimentation issues. Final remedial approaches for managed wastes will be addressed as part of future remedy decisions and response actions.

Monitoring to evaluate performance standards and achievement of RAO 1 will include non-intrusive (surface) visual inspection to confirm remedy components prevent co-mingling of mine portal MIW discharges and contaminated mine waste. Additional remedy performance monitoring consisting of surface water measurements and/or sample collection and analysis will be conducted to monitor effectiveness of the implemented IRA.

Maintenance of the diversion/isolation components and interim local waste management locations will be conducted as needed, primarily due to events that could compromise the components (e.g., storm events, wildland fires). Non-intrusive (surface) visual inspection of

interim local management locations and diversion/isolation components will be conducted to assess maintenance requirements. Maintenance will be then performed as necessary to maintain the integrity of both newly constructed and previously existing components.

The mine portal MIW discharges selected interim remedy will also include common elements that will be required as part of the selected interim remedy for all contaminant migration issues, as described in Section 9.3. Examples of these common elements include, but are not limited to, pre-construction surveys, erosion and sediment control measures, dust suppression, access road improvements (as necessary), and generation of uncontaminated borrow for construction of remedial components and access roads.

Mine portal MIW discharges will be addressed at the following mining-related sources:

- Junction Mine
- Koehler Tunnel
- Brooklyn Mine
- Bandora Mine
- Natalie/Occidental Mine
- Henrietta Mine
- Mammoth Tunnel
- Anglo Saxon Mine
- Yukon Tunnel
- Mountain Queen Mine
- Vermillion Mine
- Sunbank Group Mine
- Frisco/Bagley Tunnel
- Columbus Mine
- Silver Wing Mine
- Tom Moore Mine
- Terry Tunnel
- Pride of the West Mine

Exhibit 12-1 provides a summary of the major remedial components for the mine portal MIW discharges selected interim remedy and the estimated quantities for these components.

**Exhibit 12-1 Summary of Major Remedial Components and Associated Quantities for the Mine Portal MIW Discharges Selected Interim Remedy**

<b>Remedial Component</b>	<b>Unit</b>	<b>Estimated Quantity</b>
Estimated number of mining-related sources with mine portal MIW discharges	EA	18
Estimated total length of diversion/isolation components to be constructed	LF	3,320
Estimated in-place volume of mine wastes/materials partially obstructing mine portal MIW discharges	CY	30
Estimated weight of dewatering agent (assumed to be diatomaceous earth)	TON	4
Estimated in-place volume of borrow material for remedial component construction	CY	3,160

**Notes:**

Although detailed quantities have been provided, they should be considered approximate for evaluation purposes only.

EA – each, LF – linear feet, CY – cubic yards, TON – tons

#### **12.1.4 Estimated Cost of the Selected Interim Remedy**

The present value cost of the mine portal MIW discharges selected interim remedy is approximately \$2,411,000. The estimated capital costs are \$1,082,000, and O&M and periodic costs (over 15 years) are \$2,191,000. The construction timeframe is estimated to be one season for individual mining-related sources, and up to 5 years for all sources addressed by this IRA for mine portal MIW discharges. Table 12-1A presents the cost estimate summary for the mine portal MIW discharges selected interim remedy, including the present value analysis on a year-by-year basis, assuming a real discount rate of 7 percent. Table 12-1B presents the cost estimate summary for the mine portal MIW discharges selected interim remedy at the Brooklyn Mine.

The information in Tables 12-1A and 12-1B is based on the best available information regarding the anticipated scope of the mine portal MIW discharges selected interim remedy. Changes in the cost elements may occur as a result of new information and data collected during the engineering design of the selected interim remedy. This is an order-of-magnitude engineering cost estimate that is expected to be within +50 to -30 percent of the actual project cost.

#### **12.1.5 Expected Outcomes of the Selected Interim Remedy**

The mine portal MIW discharges selected interim remedy will provide protection of human health and the environment in the short term and is intended to provide adequate protection until a final remedy is selected. While the Site-wide risk assessment is ongoing, it is assumed that the alternative will not result in unlimited use and unrestricted exposure land use scenarios.

The loading of COPCs is expected to decrease under the mine portal MIW discharges selected interim remedy because diversion/isolation components addressing the interaction between mine portal MIW discharges and mine wastes reduces the contact of the water with the waste. This will reduce the potential for mine portal MIW discharges to generate additional MIW and reduce transport and deposition of particulates containing COPCs to surface water, which contribute to unacceptable ecological risks. However, the water quality in the streams, irrespective of the removed mine wastes and diversion/isolation components, will still be impacted and contribute to unacceptable ecological risks. Short-term increases in contaminant loading could result due to

disturbances of the mine wastes during excavation, resulting in temporary increases in production of MIW.

Intrusive monitoring, consisting of surface water measurements and/or sample collection and analysis, will be conducted to monitor effectiveness of the implemented remedy. This data will provide information about the effectiveness of the IRA and is intended to help inform future remedial decisions at the Site.

Residual risks remain from untreated mine wastes managed locally at the mining-related source on an interim basis. Local management of excavated mine wastes will include BMPs such as berming, as necessary, to address fugitive dust and potential erosion and sedimentation issues as well as inspection and repair, as necessary, to maintain their integrity of interim waste management locations.

The anticipated socioeconomic and community revitalization impacts and environmental and ecological benefits of the mine portal MIW discharges selected interim remedy will be limited given the interim nature and limited scope of these actions.

## **12.2 MINING-RELATED SOURCE/STORMWATER INTERACTIONS**

### **12.2.1 Short Description of the Selected Interim Remedy**

The mining-related source/stormwater interactions selected interim remedy involves construction of diversion and isolation components to route stormwater around mine portals and/or contaminated mine waste with the potential for interaction and co-mingling at mining-related sources. It would also include maintenance of previously existing and newly constructed diversion and isolation components.

### **12.2.2 Rationale for the Selected Interim Remedy**

The mining-related source/stormwater interactions selected interim remedy reduces the potential for uncontrolled releases of particulates and MIW from mine waste through a reduction of the contact between waste and stormwater. The mining-related source/stormwater interactions selected interim remedy will achieve RAO 1 by routing stormwater around mine portals and/or contaminated mine waste with the potential for interaction and co-mingling at mining-related sources. RAOs 2 and 3 are not pertinent to this IRA.

### **12.2.3 Detailed Description of the Selected Interim Remedy**

Diversion or isolation components implemented at each mining-related source will be chosen on a location-by-location basis. Open channels typically will be constructed to collect stormwater and divert it around the existing mine portals or mine waste. The construction of berms immediately upgradient of mine portals or mine waste, collection/diversion piping or liners, or a combination of multiple types of components are also viable for locations that are not conducive to open-channel diversion. Berms will be considered at locations with underlying rock surfaces, while collection/diversion piping or liners will be considered at locations with steep slopes or other features that will pose challenges, such as roads directly adjacent to proposed diversion/isolation components. These assumptions will be refined at the time of remedial design using location-

specific information. At mining-related sources with existing stormwater diversion or isolation components, repairs will be conducted to improve the conditions of those components. Wastes generated from excavation stormwater diversion components such as open channels are assumed to be uncontaminated and do not have handling and management requirements beyond BMPs for erosion and sedimentation.

Where amenable, the mining-related source/stormwater interactions selected interim remedy could include subsurface components in conjunction with the surface components previously described. Subsurface components such as interception trenches or French drains could be constructed to intercept stormwater that has infiltrated into the shallow subsurface and divert it around mine portals or mine waste.

Monitoring to evaluate performance standards and achievement of RAO 1 will include non-intrusive (surface) visual inspection to confirm diversion and isolation components prevent comingling of stormwater and contaminated mine waste. Additional remedy performance monitoring consisting of surface water measurements and/or sample collection and analysis will be conducted to monitor effectiveness of the implemented IRA.

Maintenance of the diversion/isolation components will be conducted as needed, primarily due to events that could compromise the components (e.g., storm events, wildland fires). Non-intrusive (surface) visual inspection of diversion and isolation components will be conducted to assess maintenance requirements. Maintenance will be then performed as necessary to maintain the integrity of both newly constructed and previously existing diversion and isolation components.

The mining-related source/stormwater interactions selected interim remedy will also include common elements that will be required as part of the selected interim remedy for all contaminant migration issues, as described in Section 9.3. Examples of these common elements include, but are not limited to, pre-construction surveys, erosion and sediment control measures, dust suppression, access road improvements (as necessary), and generation of uncontaminated borrow for construction of remedial components and access roads.

Mining-related source/stormwater interactions will be addressed at the following mining-related sources:

- Brooklyn Mine
- Bandora Mine
- Grand Mogul Mine
- Yukon Tunnel
- Ben Butler Mine
- Mountain Queen Mine
- Vermillion Mine
- Sunbank Group Mine
- Columbus Mine

- Silver Wing Mine

Exhibit 12-2 provides a summary of the major remedial components for the mining-related source/stormwater interactions selected interim remedy and the estimated quantities for these components.

**Exhibit 12-2 Summary of Major Remedial Components and Associated Quantities for the Mining-Related Source/Stormwater Interactions Selected Interim Remedy**

Remedial Component	Unit	Estimated Quantity
Estimated number of mining-related sources with mining-related source/stormwater interactions	EA	10
Estimated total length of diversion/isolation components to be constructed	LF	4,120
Estimated in-place volume of borrow material for remedial component construction	CY	3,400

**Notes:**

Although detailed quantities have been provided, they should be considered approximate for evaluation purposes only.

EA – each, LF – linear feet, CY – cubic yards

#### 12.2.4 Estimated Cost of the Selected Interim Remedy

The present value cost of the mining-related source/stormwater interactions selected interim remedy is approximately \$1,889,000. The estimated capital costs are \$1,035,000, and O&M and periodic costs (over 15 years) are \$1,407,000. The construction timeframe is estimated to be one season for individual mining-related sources, and up to 5 years for all sources addressed by this IRA for mining-related source/stormwater interactions. Table 12-2A presents the cost estimate summary for the mining-related source/stormwater interactions selected interim remedy, including the present value analysis on a year-by-year basis, assuming a real discount rate of 7 percent. Table 12-2B presents the cost estimate summary for the mining-related source/stormwater interactions selected interim remedy at the Brooklyn Mine.

The information in Tables 12-2A and 12-2B is based on the best available information regarding the anticipated scope of the mining-related source/stormwater interactions selected interim remedy. Changes in the cost elements may occur as a result of new information and data collected during the engineering design of the selected interim remedy. This is an order-of-magnitude engineering cost estimate that is expected to be within +50 to -30 percent of the actual project cost.

#### 12.2.5 Expected Outcomes of the Selected Interim Remedy

The mining-related source/stormwater interactions selected interim remedy will provide protection of human health and the environment in the short term and is intended to provide adequate protection until a final remedy is selected. While the Site-wide risk assessment is ongoing, it is assumed that the alternative will not result in unlimited use and unrestricted exposure land use scenarios.

The loading of COPCs is expected to decrease under the mining-related source/stormwater interactions selected interim remedy because routing of stormwater around mine portals and/or



contaminated mine wastes with the potential for interaction and co-mingling at mining-related sources. This will reduce the potential for stormwater to generate additional MIW and release particulates containing COPCs to surface water, which contribute to unacceptable ecological risks. However, the water quality in the streams, irrespective of diverted/isolated stormwater, will still be impacted.

Intrusive monitoring, consisting of surface water measurements and/or sample collection and analysis, will be conducted to monitor effectiveness of the implemented remedy. This data will provide information about the effectiveness of the IRA and is intended to help inform future remedial decisions at the Site.

The anticipated socioeconomic and community revitalization impacts and environmental and ecological benefits of the mining-related source/stormwater interactions selected interim remedy will be limited given the interim nature and limited scope of these actions.

## **12.3 MINE PORTAL POND SEDIMENTS**

### **12.3.1 Short Description of the Selected Interim Remedy**

The mine portal pond sediments selected interim remedy involves excavation of existing sediment and repair of berms within mine portal ponds to allow continued pond function. Excavated wastes will be managed locally at the mining-related source on an interim basis.

### **12.3.2 Rationale for the Selected Interim Remedy**

The mine portal pond sediments selected interim remedy reduces the potential for uncontrolled releases of particulates and MIW from sediment in mine portal ponds that contribute to unacceptable ecological risks. The mine portal pond sediments selected interim remedy will achieve RAO 1 by excavation of existing sediment and repair of berms within mine portal ponds to allow continued pond function. RAOs 2 and 3 are not pertinent to this IRA.

### **12.3.3 Detailed Description of the Selected Interim Remedy**

Prior to removing sediment, the mine portal ponds will be drained as needed. MIW within ponds will be managed locally solely to facilitate sediment excavation without treatment or external discharge to surface water. At mining-related sources where multiple ponds exist, MIW management from mine portals will include diversion of the MIW from one pond into the other ponds while mine portal pond sediment is being excavated. At mining-related sources where only one pond exists, mine portal pond sediment could be removed in phases using temporary berms in order to manage MIW within the pond. Short-circuiting of ponds (MIW passing through or around the pond without treatment), if those conditions currently exist, will also be addressed through the construction or repair of pond berms.

Excavating sediment will be conducted at mine portal ponds to facilitate continued function of the ponds. During the excavation process, the excavated wastes will be placed at the mining-related source for gravity dewatering as needed. The location for this activity is assumed to be amenable to dewatering without the need for liners or other isolation measures. Additional dewatering could be implemented for saturated sediment through ex situ amendment with a

dewatering agent, as necessary, for handling and geotechnical stability prior to interim management at the mining-related source. Physical characterization, such as analysis of geotechnical parameters, will be conducted as needed on excavated and dewatered sediment to evaluate physical stability. All dewatering activities will be conducted in a way to minimize infiltration into the ground surfaces. Excavated wastes will be managed locally at the mining-related source on an interim basis. It is assumed that placement will be at an already impacted area; therefore, placement of mine portal pond sediment will not risk contaminating a previously unimpacted area. Interim local waste management will include BMPs such as berming, as necessary, to address fugitive dust and potential erosion and sedimentation issues. Final remedial approaches for managed wastes will be addressed as part of future remedy decisions and response actions.

Monitoring to evaluate performance standards and achievement of RAO 1 will include non-intrusive (surface) visual inspection to monitor sediment levels in ponds and continued pond function. Additional remedy performance monitoring consisting of surface water measurements and/or sample collection and analysis will be conducted to monitor effectiveness of the implemented IRA.

Maintenance of the pond berms and interim local waste management locations will be conducted as needed, primarily due to events that could compromise the components (e.g., storm events, wildland fires). Non-intrusive (surface) visual inspection of interim local waste management locations will be conducted to assess maintenance requirements. Maintenance will be then performed as necessary to remove future accumulation of sediment in ponds and to maintain the integrity of both newly constructed and previously existing pond berms and interim management location components.

The mine portal pond sediments selected interim remedy will also include common elements that will be required as part of the selected interim remedy for all contaminant migration issues, as described in Section 9.3. Examples of these common elements include, but are not limited to, pre-construction surveys, erosion and sediment control measures, dust suppression, access road improvements (as necessary), and generation of uncontaminated borrow for construction of remedial components and access roads. The assumptions for the mine portal pond sediments selected interim remedy will be refined at the time of remedial design using location-specific information.

Mine portal pond sediments will be addressed at the following mining-related sources:

- Junction Mine
- Koehler Tunnel
- Brooklyn Mine
- Mammoth Tunnel
- Anglo Saxon Mine
- Sunbank Group Mine
- Frisco/Bagley Tunnel

- Silver Wing Mine

Exhibit 12-3 provides a summary of the major remedial components for the mine portal pond sediments selected interim remedy and the estimated quantities for these components.

**Exhibit 12-3 Summary of Major Remedial Components and Associated Quantities for the Mine Portal Pond Sediments Selected Interim Remedy**

Remedial Component	Unit	Estimated Quantity
Estimated number of mining-related sources with mine portal pond sediments	EA	8
Estimated number of ponds	EA	14
Estimated horizontal extent of ponds	SF	68,800
Estimated in-place volume of mine portal pond sediments	CY	10,200
Estimated weight of dewatering agent (assumed to be diatomaceous earth)	TON	190
Estimated in-place volume of borrow material for remedial component construction	CY	2,710

**Notes:**

Although detailed quantities have been provided, they should be considered approximate for evaluation purposes only.

EA – each, SF – square feet, CY – cubic yards, TON – tons

#### 12.3.4 Estimated Cost of the Selected Interim Remedy

The present value cost of the mine portal pond sediments selected interim remedy is approximately \$3,384,000. The estimated capital costs are \$1,355,000, and O&M and periodic costs (over 15 years) are \$3,497,000. The construction timeframe is estimated to be one season for individual mining-related sources, up to 5 years for all sources addressed by this IRA for mine portal pond sediments. Table 12-3A presents the cost estimate summary for the mine portal pond sediments selected interim remedy, including the present value analysis on a year-by-year basis, assuming a real discount rate of 7 percent. Table 12-3B presents the cost estimate summary for the mine portal pond sediments selected interim remedy at the Brooklyn Mine.

The information in Tables 12-3A and 12-3B is based on the best available information regarding the anticipated scope of the mine portal pond sediments selected interim remedy. Changes in the cost elements are likely to occur as a result of new information and data collected during the engineering design of the selected interim remedy. This is an order-of-magnitude engineering cost estimate that is expected to be within +50 to -30 percent of the actual project cost.

#### 12.3.5 Expected Outcomes of the Selected Interim Remedy

The mine portal pond sediments selected interim remedy will provide protection of human health and the environment in the short term and is intended to provide adequate protection until a final remedy is selected. While the Site-wide risk assessment is ongoing, it is assumed that the alternative will not result in unlimited use and unrestricted exposure land use scenarios.

The loading of COPCs is expected to decrease under the mine portal pond sediments selected interim remedy because excavating pond sediments improves the effectiveness of the pond. This will reduce the potential for uncontrolled releases, transport, and deposition of particulates and MIW containing COPCs to surface water from mine portal ponds, which contribute to

unacceptable ecological risks. However, the water quality in the streams, irrespective of the removed mine portal pond sediments, will still be impacted. Short-term increases in contaminant loading could result due to disturbance of the mine portal pond sediments during excavation, resulting in temporary increases in production of MIW.

Intrusive monitoring, consisting of surface water measurements and/or sample collection and analysis, will be conducted to monitor effectiveness of the implemented remedy. This data will provide information about the effectiveness of the IRA and is intended to help inform future remedial decisions at the Site.

Residual risks remain from untreated mine portal pond sediments managed locally at the mining-related source on an interim basis. Local management of mine portal pond sediments will include BMPs such as berming, as necessary, to address fugitive dust and potential erosion and sedimentation issues as well as inspection and repair, as necessary, to maintain their integrity of interim waste management locations.

The anticipated socioeconomic and community revitalization impacts and environmental and ecological benefits of the mine portal pond sediments selected interim remedy will be limited given the interim nature and limited scope of these actions.

## **12.4 IN-STREAM MINE WASTES**

### **12.4.1 Short Description of the Selected Interim Remedy**

The in-stream mine wastes selected interim remedy involves excavation of in-stream mine wastes at mining-related sources to remove wastes that impede flow or are susceptible to erosion or leaching of contaminants. Excavated wastes will be managed locally at the mining-related source on an interim basis.

### **12.4.2 Rationale for the Selected Interim Remedy**

The in-stream mine wastes selected interim remedy reduces the potential for uncontrolled releases of particulates and MIW from in-stream mine wastes that contribute to unacceptable ecological risks. The in-stream mine wastes selected interim remedy will achieve RAO 1 by excavation of in-stream mine wastes at mining-related sources to remove wastes that impede flow or are susceptible to erosion or leaching of contaminants. RAOs 2 and 3 are not pertinent to this IRA.

### **12.4.3 Detailed Description of the Selected Interim Remedy**

During the excavation process, the excavated wastes will be placed outside of the stream channel adjacent to the mining-related source for gravity dewatering. The location for this activity is assumed to be amenable to dewatering without the need for liners or other isolation measures. Additional dewatering could be implemented for saturated mine wastes through ex situ amendment with a dewatering agent, as necessary, for handling and geotechnical stability prior to interim management at the mining-related source. Physical characterization such as analysis of geotechnical parameters will be conducted, as needed, on excavated and dewatered sediment to evaluate physical stability. All dewatering activities will be conducted in a way to minimize

infiltration into the ground surfaces. Excavated wastes will be managed locally at the mining-related source on an interim basis. It is assumed that placement will be at an already impacted area; therefore, placement of in-stream mine wastes will not risk contaminating a previously unimpacted area. Interim local waste management will include BMPs such as berming, as necessary, to address fugitive dust and potential erosion and sedimentation issues. Final remedial approaches for managed wastes, will be addressed as part of future remedy decisions and response actions.

Monitoring to evaluate performance standards and achievement of RAO 1 will include non-intrusive (surface) visual inspection to confirm removal of in-stream mine waste. Additional remedy performance monitoring consisting of surface water measurements and/or sample collection and analysis will be conducted to monitor effectiveness of the implemented IRA.

Maintenance of the interim local waste management locations will be conducted as needed, primarily due to events that could compromise the components (e.g., storm events, wildland fires). Non-intrusive (surface) visual inspection of interim local waste management locations will be conducted to assess maintenance requirements. Maintenance will be then performed as necessary to maintain the integrity of interim management location components.

The in-stream mine wastes selected interim remedy will also include common elements that will be required as part of the selected interim remedy for all contaminant migration issues, as described in Section 9.3. Examples of these common elements include, but are not limited to, pre-construction surveys, erosion and sediment control measures, dust suppression, access road improvements (as necessary), and generation of uncontaminated borrow for construction of remedial components and access roads. The assumptions for the in-stream mine wastes selected interim remedy will be refined at the time of remedial design using location-specific information.

In-stream mine wastes will be addressed at the following mining-related source:

- Grand Mogul Mine

Exhibit 12-4 provides a summary of the major remedial components for the in-stream mine wastes selected interim remedy and the estimated quantities for these components.

**Exhibit 12-4 Summary of Major Remedial Components and Associated Quantities for the In-Stream Mine Wastes Selected Interim Remedy**

Remedial Component	Unit	Estimated Quantity
Estimated number of mining-related sources with in-stream mine wastes	EA	1
Estimated horizontal extent of in-stream mine wastes	SF	4,200
Estimated in-place volume of in-stream mine wastes	CY	470
Estimated weight of dewatering agent (assumed to be diatomaceous earth)	TON	10
Estimated in-place volume of borrow material for remedial component construction	CY	90

**Notes:**

Although detailed quantities have been provided, they should be considered approximate for evaluation purposes only.

EA – each, SF – square feet, CY – cubic yards, TON – tons

#### **12.4.4 Estimated Cost of the Selected Interim Remedy**

The present value cost of the in-stream mine wastes selected interim remedy is approximately \$512,000. The estimated capital costs are \$264,000, and O&M and periodic costs (over 15 years) are \$408,000. The construction timeframe is estimated to be one season. Table 12-4 presents the cost estimate summary for the in-stream mine wastes selected interim remedy, including the present value analysis on a year-by-year basis, assuming a real discount rate of 7 percent.

The information in Table 12-4 is based on the best available information regarding the anticipated scope of the in-stream mine wastes selected interim remedy. Changes in the cost elements are likely to occur as a result of new information and data collected during the engineering design of the selected interim remedy. This is an order-of-magnitude engineering cost estimate that is expected to be within +50 to -30 percent of the actual project cost.

#### **12.4.5 Expected Outcomes of the Selected Interim Remedy**

The in-stream mine wastes selected interim remedy will provide protection of human health and the environment in the short term and is intended to provide adequate protection until a final remedy is selected. While the Site-wide risk assessment is ongoing, it is assumed that the alternative will not result in unlimited use and unrestricted exposure land use scenarios.

Through removal of in-stream mine wastes, the loading of COPCs is expected to decrease because it reduces the contact of the water with the waste. This will reduce formation of MIW and transport and deposition of particulates containing COPCs to surface water, which contribute to unacceptable ecological risks. However, the water quality in the streams, irrespective of the removed mine wastes, will still be impacted. Short-term increases in contaminants loading could result due to disturbance of the mine wastes during excavation, resulting in temporary increase in production of MIW.

Intrusive monitoring, consisting of surface water measurements and/or sample collection and analysis, will be conducted to monitor effectiveness of the implemented remedy. This data will provide information about the effectiveness of the alternative and is intended to help inform future remedial decisions at the Site.

Residual risks will remain from untreated wastes managed locally at the mining-related source on an interim basis. Local management of wastes will include BMPs such as berming, as necessary, to address fugitive dust and potential erosion and sedimentation issues as well as inspection and repair, as necessary, to maintain their integrity of interim waste management locations.

The anticipated socioeconomic and community revitalization impacts and environmental and ecological benefits of the in-stream mine wastes selected interim remedy will be limited given the interim nature and limited scope of these actions.

## **12.5 MINING-IMPACTED RECREATION STAGING AREAS**

### **12.5.1 Short Description of the Selected Interim Remedy**

The mining-impacted recreation staging areas selected interim remedy includes containment/isolation of mine wastes within mining-impacted recreation staging areas using covers to reduce disturbances of mine wastes and migration of contaminants. The covers will provide an exposure barrier and eliminate surface exposure to mine waste or contaminated soil.

### **12.5.2 Rationale for the Selected Interim Remedy**

The mining-impacted recreation staging areas selected interim remedy will break the pathway for soil ingestion and reduce the potential for uncontrolled releases of particulates that contribute to unacceptable ecological risk. The mining-impacted recreation staging areas selected interim remedy will achieve RAOs 2 and 3 by containment/isolation of mine wastes within mining-impacted recreation staging areas using covers to reduce disturbances of mine wastes and migration of contaminants. RAO 1 is not pertinent to this IRA.

### **12.5.3 Detailed Description of the Selected Interim Remedy**

A combination of different types of covers will be constructed at mining-impacted recreation staging areas. The covers will be sloped to promote positive drainage in order to minimize erosion and to reduce infiltration that could saturate the subsurface and compromise the integrity of the covers. The prepared mine waste or contaminated soil surface will then be covered with an engineered layer of soil (which could be vegetated) or a surface layer of rock. Vegetated layers will be amended with organics, lime, and fertilizer, and then seeded. The specific types of covers will be determined based on specific recreation staging uses of each mining-related source and availability of sufficient quantities of suitable cover materials for that use. Aggregate covers are assumed to be constructed over mine waste or contaminated soil at portions of staging areas exposed to continuous vehicle traffic, such as parking areas adjacent to campsites and along stream banks of campsites. Soil covers are assumed to be constructed over mine waste at areas not exposed to continuous vehicle traffic, such as the campsites themselves. These assumptions will be refined at the time of remedial design.

A pre-design investigation will be conducted to include sample collection and analysis at the mining-impacted recreation staging areas. Results from the pre-design investigation will be used to delineate the horizontal extent of remediation at the mining-impacted recreation staging areas, based on a comparison to the human health cleanup levels detailed in Section 8.2.1. For purposes of the IROD, physical information such as, but not limited to, topography and soil types (i.e., relatively flat areas free of large boulders and cobbles) was used to conservatively estimate the horizontal extent of remediation.

Monitoring to evaluate performance standards and achievement of RAOs 2 and 3 will include non-intrusive (surface) visual inspection to monitor integrity of the covers.

Maintenance of the interim local waste management locations will be conducted as needed, primarily due to events that could compromise the components (e.g., storm events, wildland fires). Non-intrusive (surface) visual inspection of cover components will be conducted to assess

maintenance requirements. Maintenance will be then performed as necessary to maintain the integrity of cover components.

The mining-impacted recreation staging areas selected interim remedy will also include common elements that will be required as part of the selected interim remedy for all contaminant migration issues, as described in Section 9.3. Examples of these common elements include, but are not limited to, pre-construction surveys, erosion and sediment control measures, dust suppression, access road improvements (as necessary), and generation of uncontaminated borrow for construction of remedial components and access roads.

Mining-impacted recreation staging areas will be addressed at the following mining-related sources:

- Longfellow Mine
- Junction Mine
- Koehler Tunnel
- Campground 4
- Campground 7

Exhibit 12-5 provides a summary of the major remedial components for the mining-impacted recreation staging areas selected interim remedy and the estimated quantities for these components.

**Exhibit 12-5 Summary of Major Remedial Components and Associated Quantities for the Mining-Impacted Recreation Staging Areas Selected Interim Remedy**

Remedial Component	Unit	Estimated Quantity
Estimated number of mining-related sources with mining-impacted recreation staging areas	EA	5
Estimated horizontal extent of aggregate (rock) covers to be constructed	AC	2.0
Estimated horizontal extent of soil covers to be constructed	AC	6.9
Estimated in-place volume of borrow material for remedial component construction	CY	18,600

**Notes:**

Although detailed quantities have been provided, they should be considered approximate for evaluation purposes only.

AC – acres, EA – each, CY – cubic yards

#### **12.5.4 Estimated Cost of the Selected Interim Remedy**

The present value cost of the mining-impacted recreation staging areas selected interim remedy is approximately \$1,668,000. The estimated capital costs are \$1,210,000, and O&M and periodic costs (over 15 years) are \$758,000. The construction timeframe is estimated to be one season for individual mining-related sources, up to 5 years for all mining-impacted recreation staging areas. Table 12-5 presents the cost estimate summary for the mining-impacted recreation staging areas selected interim remedy, including the present value analysis on a year-by-year basis, assuming a real discount rate of 7 percent.



The information in Table 12-5 is based on the best available information regarding the anticipated scope of the mining-impacted recreation staging areas selected interim remedy. Changes in the cost elements are likely to occur as a result of new information and data collected during the engineering design of the selected interim remedy. This is an order-of-magnitude engineering cost estimate that is expected to be within +50 to -30 percent of the actual project cost.

#### **12.5.5 Expected Outcomes of the Selected Interim Remedy**

The mining-impacted recreation staging areas selected interim remedy will provide protection of human health and the environment in the short term and is intended to provide adequate protection until a final remedy is selected. While the Site-wide risk assessment is ongoing, it is assumed that the alternative will not result in unlimited use and unrestricted exposure land use scenarios.

Covers will be implemented to reduce disturbances of mine wastes and contaminated soils, and exposure to mine wastes and contaminated soils containing lead or arsenic that exceed cleanup levels will be reduced.

Performance monitoring, consisting of non-intrusive (surface) visual inspection of cover components, will be conducted to monitor effectiveness of the implemented remedy.

The anticipated socioeconomic and community revitalization impacts and environmental and ecological benefits of the mining-impacted recreation staging areas selected interim remedy will be limited given the interim nature and limited scope of these actions.

## **13.0 INSTITUTIONAL AND LAND USE CONTROLS**

ICs are defined as “non-engineered instruments that help minimize the potential for exposure to contamination and/or protect the integrity of a response action” in the *Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites* (EPA 2012). ICs are a subset of land use controls (LUCs). LUCs include engineering and physical barriers, such as fences and signs, as well as ICs.

Final ICs will be selected in the final record of decision; however, the NCP recommends that ICs should be used to supplement engineering controls during all phases of cleanup. *See* NCP § 300.430(a)(1)(iii)(D). The need for and type of LUCs, including ICs, will be evaluated at each source area during the design phase of these IRAs. Prior to the final record of decision, EPA and the State of Colorado will work together to implement LUCs, including ICs, necessary to protect the integrity of the IRAs taken in this IROD. ICs will include governmental or proprietary controls on land use as provided by the Colorado Environmental Covenants Statute, C.R.S. §§ 25-15-317 *et seq.* (EC Statute), enforcement tools that limit certain activities, and informational devices to provide information or notification to local communities, recreational users and other interested persons, as appropriate.

As discussed in subsections 13.1 and 13.2, the EC Statute has been identified as an applicable requirement for the mining-impacted recreation staging areas and those components of the IRAs determined to include engineered remedial features likely to be permanent. In the event San Juan County does not enact an ordinance pursuant to C.R.S. § 25-15-320, EPA in coordination with the State will evaluate the use of restrictive notices as well as the use of LUCs, including other ICs, at all the source areas addressed in this IROD to provide notice or prevent access pending the final remedial action.

### **13.1 INSTITUTIONAL AND LAND USE CONTROLS AT MINING-IMPACTED RECREATION STAGING AREAS**

As specified in Section 12.5, covers will be used at the mining-impacted recreation staging areas to break human health exposure pathways associated with soil ingestion and reduce the potential for uncontrolled releases of particulates contributing to ecological risk. The IRA at these areas will result in waste left in place above levels safe for unlimited use and unrestricted exposure and may constitute the final remedy at these areas. In addition, the covers are engineered remedial features likely to be permanent as described in subsection 13.2. Accordingly, the EC Statute has been identified as an applicable requirement for these areas. EPA will work with the State of Colorado to implement ICs pursuant to the EC Statute, and other appropriate LUCs.

### **13.2 INSTITUTIONAL AND LAND USE CONTROLS FOR ENGINEERED REMEDIAL FEATURES LIKELY TO BE PERMANENT**

As specified in Section 12, the selected interim remedy includes components that will incorporate engineered remedial features likely to be permanent. The engineered remedial features likely to be permanent of the selected remedy include: (1) diversion or isolation components of Alternative A2 (Diversion/Isolation of Mine Portal MIW Discharges); (2) diversion or isolation components to route stormwater around mine portals associated with Alternative B2 (Stormwater Diversion/Isolation); (3) maintenance and repair of mine portal

ponds associated with Alternative C2 (Excavation and Interim Local Waste Management of Mine Portal Pond Sediments); and (4) containment and isolation of mine wastes within mining-impacted recreation staging areas using covers as described in Alternative E2 (Containment/Isolation of In-Stream Mine Wastes). EPA has determined components of the IRAs involving interim local waste management described in Alternative D2 do not constitute engineered remedial features likely to be permanent. Accordingly, the EC Statute has been identified as an applicable requirement for these features. EPA will work with the State of Colorado to implement the EC Statute at properties where engineered remedial features likely to be permanent are incorporated.

### **13.3 LAND USE RESTRICTIONS**

The following land use restrictions will be included in any environmental covenant or notice of environmental use restrictions recorded as an IC pursuant to this Record of Decision at mine-impacted recreation staging areas and for engineered remedial features likely to be permanent:

No tilling, excavation, grading, construction, or any other activity that disturbs the ground surface or subsurface or that would in any manner interfere with or adversely affect the implementation, integrity, or protectiveness of the remedial features is permitted.

## **14.0 STATUTORY DETERMINATIONS**

Under CERCLA Section 121 and the NCP, EPA must select a remedy that is protective of human health and the environment, complies with or appropriately waives ARARs, is cost effective, and uses permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that include treatment that permanently and significantly reduces the volume, toxicity, or mobility of hazardous wastes as a principal element. The following sections discuss how the five IRAs comprising the selected interim remedy meets these statutory requirements.

### **14.1 MINE PORTAL MIW DISCHARGES**

The following subsections discuss the statutory determinations for the mine portal MIW discharges IRA of the selected interim remedy.

#### **14.1.1 Protection of Human Health and the Environment**

The mine portal MIW discharges selected interim remedy will provide protection of human health and the environment in the short term and is intended to provide adequate protection until a final remedy is selected. It will provide stabilization of the mining-related sources and prevent further environmental degradation. The mine portal MIW discharges selected interim remedy addresses RAO 1 by constructing and/or maintaining diversion and isolation components to route mine portal MIW discharge around contaminated mine waste with the potential for interaction and co-mingling at mining-related sources. This will reduce the potential for mine portal MIW discharges to generate additional MIW and reduce transport and deposition of particulates containing COPCs to surface water, which contribute to unacceptable ecological risks. Mine wastes or other materials at the entrance to a mine portal that are partially obstructing free flow of MIW discharge will be excavated to reduce the potential for uncontrolled releases of particulates and MIW containing COPCs to surface water, which contribute to unacceptable ecological risks. EPA will measure the extent by which ecological risks associated with contributions from MIW discharges have been reduced by this selected interim remedy.

#### **14.1.2 Compliance with ARARs**

##### **14.1.2.1 Chemical-Specific ARARs**

Chemical-specific ARARs will be pertinent to the mine portal MIW discharges selected interim remedy. State water quality standards for COPCs will likely not be met for the streams receiving mine portal MIW discharges after the selected interim remedy is constructed due to other contributing mining-related sources, thus the interim measures CERCLA ARAR waiver will be invoked for the Colorado Basic Standards and Methodologies for Surface Water. The Colorado Basic Standards for Groundwater will also be waived using an interim measures CERCLA ARAR waiver because the limited RI information available does not indicate that groundwater meeting the regulatory definition exists beneath the mining-related sources addressed by the selected interim remedy.

#### 14.1.2.2 Location- and Action-Specific ARARs

Location- and action-specific ARARs for the mine portal MIW discharges selected interim remedy will be addressed during implementation of the IRA, as indicated in the following paragraphs.

**Excavation:** The excavation of mine wastes from waters of the United States is assumed to be performed with neat excavation only involving incidental fallback. Thus, the substantive requirements of Section 404 will not be triggered. If grading or excavation activities result in a discharge of dredge material, the substantive requirements of Nationwide Permit 20 (Response Operations for Oil or Hazardous Substances) will be met.

**Dust Suppression:** Dust suppression and emission-controlled equipment will be used during construction activities for the selected interim remedy to achieve compliance with Colorado emission control requirements.

**Dewatering:** If effluent discharge to surface water is necessary during dewatering,, activities would be conducted in a way to minimize infiltration into the ground surface that could cause additional degradation of groundwater. Because the groundwater, as defined in 5 CCR 1002-41, is not known to be present below the mining-related sources, an interim measures CERCLA ARAR waiver will be invoked. An interim measures CERCLA ARAR waiver will also be invoked to waive the substantive provisions of Colorado Effluent Limitations and CDPS regulations for groundwater.

If effluent discharge to surface water is necessary during dewatering, the discharge limit requirements of Colorado effluent limitations will be met without treatment at the dewatering locations; otherwise an interim measures CERCLA ARAR waiver will be invoked. Similarly, the substantive provisions of the CDPS regulations will be met; otherwise an interim measures CERCLA ARAR waiver will be invoked.

**Interim Local Waste Management:** Mine wastes at the Site were derived directly or indirectly from the extraction of ore and thus will be exempt from management as a RCRA hazardous waste (i.e., the Bevill exemption), thus mine wastes will be classified as a non-hazardous solid waste.

Pursuant to the Solid Wastes Disposal Sites and Facilities Act, C.R.S. § 30-20-102(4), mining operations including reclamation activities with approved reclamation plans under an MLRB permit may dispose of solid wastes generated by such operations within the permitted area without obtaining a Certificate of Designation. The CDPHE interprets this provision to exempt CERCLA response actions performed consistently with MLRB regulation 2 CCR 407-1 Rule 3 (Reclamation Performance Standards) to be compliant with Colorado's regulations pertaining to solid waste disposal.

All waste handling and disposal activities under the selected interim remedy will be performed in accordance with substantive requirements of the relevant and appropriate subparts of MLRB regulation 2 CCR 407-1 Rule 3 (Reclamation Performance Standards), which will allow the selected interim remedy to be compliant with substantive requirements of the Colorado Solid Waste Disposal Sites and Facilities Regulations.

Grading of wastes for interim local management will be performed to meet relevant and appropriate substantive requirements of 2 CCR 407-1 Rule 3.

**Surface Reclamation:** Surface reclamation activities under the selected interim remedy, including grading, will be performed to meet relevant and appropriate substantive requirements of 2 CCR 407-1 Rule 3.

**Construction Activities:** Cultural resource surveys have not been completed for all mining-related sources addressed by the selected interim remedy. If any cultural resources are found, surveys will be necessary to determine if adverse effects will occur, and if so, how the effects may be minimized or mitigated in accordance with the National Historic Preservation Act, Archaeological and Historic Preservation Act, and Historic Sites Act.

If bald or golden eagles are observed during remedial design and IRA, activities must be modified and conducted to conserve the species and their habitat to comply with the substantive requirements of the Bald and Golden Eagle Protection Act.

If the IRA involves activities modifying streams or water bodies that affect wildlife and/or non-game fish, federal agencies must comply with substantive requirements identified by the USFWS and the relevant state agency with jurisdiction over wildlife resources in accordance with Fish and Wildlife Coordination Act and implementing regulations.

If threatened or endangered species are identified at these mining-related sources during remedial design and IRA, activities must be modified and conducted to conserve the species and their habitat in accordance with the Endangered Species Act and relevant and appropriate substantive requirements of 40 CFR 257.

If migratory birds are identified during remedial design and IRA, activities must be modified and conducted to conserve the species and their habitat in accordance with the Migratory Bird Treaty Act.

This selected interim remedy will not be conducted within streams. However, if activities were to impact streams, they will be carried out in a manner to avoid adversely affecting wildlife and/or non-game fish within streams. Compliance will be achieved through coordination with the Colorado Division of Parks Wildlife and in accordance with the Colorado Wildlife Enforcement and Penalties Act and Colorado Non-game, Endangered, or Threatened Species Act.

It is not anticipated that nests or dens of wildlife exist at the mine locations. If they were to be encountered, the selected interim remedy will be implemented to avoid disturbing or destroying nests or dens. Compliance will be achieved through coordination with the Colorado Division of Parks and Wildlife and in accordance with substantive requirements of Colorado Wildlife Commission regulations.

Planning for activities conducted during the IRA on USFS-managed land, such as obtaining borrow material and implementing the IRA at the Brooklyn Mine, will consider pertinent information provided within the San Juan National Forest and Tres Rios Field Office Land and Resource Management Plan.

If the IRA involves activities that affect identified floodplains or wetlands, activities will be carried out in a manner to avoid adversely affecting them and thus meet the substantive requirements of the Clean Water Act, Section 404 regulations, 40 CFR Part 6, Appendix A, and relevant and appropriate substantive requirements of 40 CFR 257.

Activities under the selected interim remedy will be carried out in a manner that will comply with Colorado Noise Abatement Statute 25-12-103.

#### **14.1.2.3 ARAR Waivers**

Compliance with certain ARARs may not be possible for components of the mine portal MIW discharges selected interim remedy since they are interim in scope and do not address all contaminated media posing unacceptable human health and ecological risks. Thus, the CERCLA interim measures waiver is the most pertinent to the selected interim remedy and the only CERCLA ARAR waiver identified in this IROD.

Blanket use of the CERCLA interim measures waiver will occur where the expectation is that, regardless of the conditions (i.e., the particular IRA, activity within the IRA, and/or mining-related source location), the ARAR will not be complied with and thus the waiver is invoked on a blanket basis. The ARARs that will fall under blanket waiver use include:

- Federal
  - Clean Water Act 33 U.S.C. §§ 1342, et seq., Point Source Discharges Requirements, Section 402
- State of Colorado
  - Colorado Basic Standards for Groundwater, 5 CCR 1002-41, pursuant to C.R.S. §§ 25-8-101-703
  - Colorado Surface Water Quality Classifications and Numeric Standards, 5 CCR 1002-34, pursuant to C.R.S. §§ 25-8-203 and 204
  - CDPS Regulations, 5 CCR 1002-61, Regulation No. 61, pursuant to C.R.S. § 25-8-501 -509
  - Colorado Effluent Limitations, 5 CCR 1002-62, pursuant to C.R.S. § 25-8-205

#### **14.1.3 Cost Effectiveness**

The mine portal MIW discharges selected interim remedy is cost effective and represents a reasonable value for the money to be spent. In making this determination, the following definition was used: “A remedy shall be cost effective if its costs are proportional to its overall effectiveness” [NCP §300.430(f)(1)(ii)(D)]. This is determined by evaluating the overall effectiveness of the selected interim remedy and comparing that effectiveness to the overall costs. Effectiveness is evaluated by examining how the remedy meets three criteria: long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness. Overall effectiveness of the remedial alternatives was compared to

costs to determine cost effectiveness. The relationship of the overall effectiveness of the mine portal MIW discharges selected interim remedy was determined to be proportional to its cost, and hence this remedy represents a reasonable value for the cost to be incurred.

The cost of the mine portal MIW discharges selected interim remedy is expected to have a present value cost of approximately \$2,285,000. Compared to the other alternative considered (No Action), the mine portal MIW discharges selected interim remedy has a higher cost, but it is the only alternative expected to provide protection of human health and the environment as an interim measure. EPA believes the mine portal MIW discharges selected interim remedy achieves an appropriate balance between cost effectiveness and adequate protectiveness.

#### **14.1.3.1 Utilization of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to the Maximum Extent Practicable**

This determination looks at whether the selected interim remedy provides the best balance of tradeoffs among the alternatives with respect to the balancing criteria set forth in NCP §300.430(f)(1)(i)(B) such that it represents the maximum extent to which permanence and treatment can be practicably used at the Site. NCP §300.430(f)(1)(ii)(E) provides that the balancing shall emphasize the factors of “long-term effectiveness” and “reduction of toxicity, mobility, or volume through treatment,” and shall consider the preference for treatment and bias against off-site disposal. The modifying criteria were also considered in making this determination.

The mine portal MIW discharges selected interim remedy is an interim solution only, and is not intended to utilize permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable. Permanent solutions and alternative treatment technologies or resource recovery technologies will be addressed as part of the final response action.

#### **14.1.3.2 Preference for Treatment as a Principal Element**

This determination looks at whether the selected interim remedy provides treatment as a principal element. The NCP establishes the expectation that treatment will be used to address principal threat wastes whenever practicable (40 CFR 300.430[a][1][iii][A]). Principal threat wastes are those source materials that are considered to be highly toxic or highly mobile that generally cannot be contained in a reliable manner or will present a significant risk to human health and the environment should exposure occur. As discussed in Section 11.0 of this IROD, EPA has determined that media addressed by this IRA do not involve principal threat waste. In addition, because this action does not constitute the final remedy, the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element will be considered and addressed by the final response action.

#### **14.1.4 Five-Year Site Reviews**

While the Site-wide risk assessment is ongoing, it is assumed that the mine portal MIW discharges selected interim remedy will not result in unlimited use and unrestricted exposure land use scenarios. Therefore, five-year reviews pursuant to CERCLA §121(c) and NCP §300.430(f)(5)(iii)(C) are assumed to be conducted for the mining-related sources included as



part of this selected interim remedy in conjunction with sources addressed by other response actions as part of Site-wide activities. EPA shall conduct a review of remedial actions no less often than each 5 years after the initiation of such remedial action to ensure the remedy is, or will be, protective of human health and the environment.

## **14.2 MINING-RELATED SOURCE/STORMWATER INTERACTIONS**

The following subsections discuss the statutory determinations for the mining-related source/stormwater interactions IRA of the selected interim remedy.

### **14.2.1 Protection of Human Health and the Environment**

The mining-related source/stormwater interactions selected interim remedy will provide protection of human health and the environment in the short term and is intended to provide adequate protection until a final remedy is selected. It will provide stabilization of the mining-related sources and prevent further environmental degradation. The mining-related source/stormwater interactions selected interim remedy addresses RAO 1 by constructing and/or maintaining diversion and isolation components to route stormwater around mine portals and/or mine wastes with the potential for interaction and co-mingling at mining-related sources. This will reduce the potential for stormwater to generate additional MIW and reduce transport and deposition of particulates containing COPCs to surface water, which contribute to unacceptable aquatic ecological risks. EPA will measure the extent by which ecological risks associated with contributions from mining-related source/storm water interactions have been reduced by the selected interim remedy.

### **14.2.2 Compliance with ARARs**

#### **14.2.2.1 Chemical-Specific ARARs**

Chemical-specific ARARs will be pertinent to the mining-related source/stormwater interactions selected interim remedy. State water quality standards will likely not be met for streams receiving stormwater discharges after the selected interim remedy is constructed due to other contributing mining-related sources, thus the interim measures CERCLA ARAR waiver will be invoked for the Colorado Basic Standards and Methodologies for Surface Water. The Colorado Basic Standards for Groundwater will also be waived using an interim measures CERCLA ARAR waiver because the limited RI information available does not indicate that groundwater meeting the regulatory definition exists beneath the mining-related sources addressed by the selected interim remedy.

#### **14.2.2.2 Location- and Action-Specific ARARs**

Location- and action-specific ARARs for the mining-related source/stormwater interactions selected interim remedy will be addressed during implementation of the IRA as indicated in the following paragraphs.

**Excavation:** The excavation of mine wastes from waters of the United States is assumed to be performed with neat excavation only involving incidental fallback. Thus, the substantive requirements of Section 404 will not be triggered. If grading or excavation activities result in a

discharge of dredge material, the substantive requirements of Nationwide Permit 20 (Response Operations for Oil or Hazardous Substances) will be met.

**Dust Suppression:** Dust suppression and emission-controlled equipment will be used during construction activities for the selected interim remedy to achieve compliance with Colorado Emission Control requirements.

**Surface Reclamation:** Surface reclamation activities under the selected interim remedy, including grading, will be performed to meet relevant and appropriate substantive requirements of 2 CCR 407-1 Rule 3.

**Construction Activities:** Cultural resource surveys have not been completed for all mining-related sources addressed by the selected interim remedy. If any cultural resources are found, surveys will be necessary to determine if adverse effects will occur, and if so, how the effects may be minimized or mitigated in accordance with the National Historic Preservation Act, Archaeological and Historic Preservation Act, and Historic Sites Act.

If bald or golden eagles are observed during remedial design and IRA, activities must be modified and conducted to conserve the species and their habitat to comply with the substantive requirements of the Bald and Golden Eagle Protection Act.

If the IRA involves activities modifying streams or water bodies that affect wildlife and/or non-game fish, federal agencies must comply with substantive requirements identified by USFWS and the relevant state agency with jurisdiction over wildlife resources in accordance with Fish and Wildlife Coordination Act and implementing regulations.

If threatened or endangered species are identified at these mining-related sources during remedial design and IRA, activities must be modified and conducted to conserve the species and their habitat in accordance with the Endangered Species Act and relevant and appropriate substantive requirements of 40 CFR 257.

If migratory birds are identified during remedial design and IRA, activities must be modified and conducted to conserve the species and their habitat in accordance with the Migratory Bird Treaty Act.

The mining-related source/stormwater interactions selected interim remedy will not be conducted within streams. However, if activities were to impact streams, they will be carried out in a manner to avoid adversely affecting wildlife and/or non-game fish within streams. Compliance will be achieved through coordination with the Colorado Division of Parks Wildlife and in accordance with the Colorado Wildlife Enforcement and Penalties Act and Colorado Non-game, Endangered, or Threatened Species Act.

It is not anticipated that nests or dens of wildlife exist at the mine locations. If they were to be encountered, the selected interim remedy will be implemented to avoid disturbing or destroying nests or dens. Compliance will be achieved through coordination with the Colorado Division of Parks Wildlife and in accordance with substantive requirements of Colorado Wildlife Commission regulations.

Planning for activities conducted during the IRA on USFS-managed land, such as obtaining borrow material and implementing the IRA at the Brooklyn Mine, will consider pertinent information provided within the San Juan National Forest and Tres Rios Field Office Land and Resource Management Plan.

If the IRA involves activities that affect identified floodplains or wetlands, activities will be carried out in a manner to avoid adversely affecting them and thus meet the substantive requirements of the Clean Water Act, Section 404 regulations, 40 CFR Part 6, Appendix A, and relevant and appropriate substantive requirements of 40 CFR 257.

Activities under the selected interim remedy will be carried out in a manner that will comply with Colorado Noise Abatement Statute 25-12-103.

#### **14.2.2.3 ARAR Waivers**

Compliance with certain ARARs may not be possible for components of the mine portal MIW discharges selected interim remedy since they are interim in scope and do not address all contaminated media posing unacceptable human health and ecological risks. Thus, the CERCLA interim measures waiver is the most pertinent to the selected interim remedy and the only CERCLA ARAR waiver identified in this IROD.

Blanket use of the CERCLA interim measures waiver will occur where the expectation is that regardless of the conditions (i.e., the particular IRA, activity within the IRA, and/or mining-related source location) that the ARAR will not be complied with and thus the waiver is invoked on a blanket basis. The ARARs that will fall under blanket waiver use include:

- Federal
  - Clean Water Act 33 U.S.C. §§ 1342, et seq., Point Source Discharges Requirements, Section 402
- State of Colorado
  - Colorado Basic Standards for Groundwater, 5 CCR 1002-41, pursuant to C.R.S. §§ 25-8-101-703
  - Colorado Surface Water Quality Classifications and Numeric Standards, 5 CCR 1002-34, pursuant to C.R.S. §§ 25-8-203 and 204
  - CDPS Regulations, 5 CCR 1002-61, Regulation No. 61, pursuant to C.R.S. § 25-8-501 -509
  - Colorado Effluent Limitations, 5 CCR 1002-62, pursuant to C.R.S. § 25-8-205

#### **14.2.3 Cost Effectiveness**

The mining-related source/stormwater interactions selected interim remedy is cost effective and represents a reasonable value for the money to be spent. In making this determination, the following definition was used: “A remedy shall be cost effective if its costs are proportional to its

overall effectiveness” [NCP §300.430(f)(1)(ii)(D)]. This is determined by evaluating the overall effectiveness of the selected interim remedy and comparing that effectiveness to the overall costs. Effectiveness is evaluated by examining how the remedy meets three criteria: long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness. Overall effectiveness of the remedial alternatives was compared to costs to determine cost effectiveness. The relationship of the overall effectiveness of the selected interim remedy was determined to be proportional to its cost, and hence this remedy represents a reasonable value for the cost to be incurred.

The cost of the mine-related source/stormwater interactions selected interim remedy is expected to have a present value cost of approximately \$1,836,000. Compared to the other alternative considered (No Action), the mining-related source/stormwater interactions selected interim remedy has a higher cost, but it is the only alternative expected to provide protection of human health and the environment as an interim measure. EPA believes the mining-related source/stormwater interactions selected interim remedy achieves an appropriate balance between cost effectiveness and adequate protectiveness.

#### **14.2.4 Utilization of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to the Maximum Extent Practicable**

This determination looks at whether the selected interim remedy provides the best balance of tradeoffs among the alternatives with respect to the balancing criteria set forth in NCP §300.430(f)(1)(i)(B) such that it represents the maximum extent to which permanence and treatment can be practicably used at the Site. NCP §300.430(f)(1)(ii)(E) provides that the balancing shall emphasize the factors of “long-term effectiveness” and “reduction of toxicity, mobility, or volume through treatment,” and shall consider the preference for treatment and bias against off-site disposal. The modifying criteria were also considered in making this determination.

This mining-related source/stormwater interactions selected interim remedy is an interim solution only, and is not intended to use permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable. Permanent solutions and alternative treatment technologies or resource recovery technologies will be addressed as part of the final response action.

#### **14.2.5 Preference for Treatment as a Principal Element**

This determination looks at whether the selected interim remedy provides treatment as a principal element. The NCP establishes the expectation that treatment will be used to address principal threat wastes whenever practicable (40 CFR 300.430[a][1][iii][A]). Principal threat wastes are those source materials that are considered to be highly toxic or highly mobile that generally cannot be contained in a reliable manner or will present a significant risk to human health and the environment should exposure occur. As discussed in Section 11.0 of this IROD, EPA has determined that media addressed by this IRA do not involve principal threat waste. In addition, because this action does not constitute the final remedy, the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element will be considered and addressed by the final response action.

### **14.2.6 Five-Year Site Reviews**

While the Site-wide risk assessment is ongoing, it is assumed that the mining-related source/stormwater interactions selected interim remedy will not result in unlimited use and unrestricted exposure land use scenarios. Therefore, five-year reviews pursuant to CERCLA §121(c) and NCP §300.430(f)(5)(iii)(C) are assumed to be conducted for the mining-related sources included as part of this selected interim remedy in conjunction with sources addressed by other response actions as part of Site-wide activities. EPA shall conduct a review of remedial actions no less often than each 5 years after the initiation of such remedial action to ensure the remedy is, or will be, protective of human health and the environment.

## **14.3 MINE PORTAL POND SEDIMENTS**

The following subsections discuss the statutory determinations for the mine portal pond sediments IRA of the selected interim remedy.

### **14.3.1 Protection of Human Health and the Environment**

The mine portal pond sediments selected interim remedy will provide protection of human health and the environment in a short term and is intended to provide adequate protection until a final remedy is selected. It will provide stabilization of the source and prevent further environmental degradation. The mine portal pond sediments selected interim remedy addresses RAO 1 through excavation and interim local waste management of pond sediments that will reduce the potential for uncontrolled releases of particulates containing COPCs to surface water, which contribute to unacceptable ecological risks. Excavation of pond sediments and repair of pond berms will increase storage space for MIW in ponds and minimize short-circuiting of MIW to increase residence time. EPA will measure the extent by which ecological risks associated with contributions from mine portal pond sediments have been reduced by the mine portal pond sediments selected interim remedy.

### **14.3.2 Compliance with ARARs**

#### **14.3.2.1 Chemical-Specific ARARs**

Chemical-specific ARARs will be pertinent to the mine portal pond sediments selected interim remedy. State water quality standards will not be met for the streams after removal of mine portal pond sediments is complete due to other contributing mining-related sources; thus, the interim measures CERCLA ARAR waiver will be invoked for the Colorado Basic Standards and Methodologies for Surface Water. The Colorado Basic Standards for Groundwater will also be waived using an interim measures CERCLA ARAR waiver because the limited RI information available does not indicate that groundwater meeting the regulatory definition exists beneath the mining-related sources addressed by the selected interim remedy.

#### **14.3.2.2 Location- and Action-Specific ARARs**

Location- and action-specific ARARs for the mine portal pond sediments selected interim remedy will be addressed during implementation of the IRA, as indicated in the following paragraphs.

**Excavation:** The excavation of mine wastes from waters of the United States is assumed to be performed with neat excavation only involving incidental fallback. Thus, the substantive requirements of Section 404 will not be triggered. If grading or excavation activities result in a discharge of dredge material, the substantive requirements of Nationwide Permit 20 (Response Operations for Oil or Hazardous Substances) will be met.

**Dust Suppression:** Dust suppression and emission-controlled equipment will be used during construction activities for the selected interim remedy to achieve compliance with Colorado emission control requirements.

**Dewatering:** If effluent discharge to surface water is necessary during dewatering or pond draining activities, activities would be conducted in a way to minimize infiltration into the ground surface that could cause additional degradation of groundwater. Because the groundwater, as defined in 5 CCR 1002-41, is not known to be present below the mining-related sources, an interim measures CERCLA ARAR waiver will be invoked. An interim measures CERCLA ARAR waiver will also be invoked to waive the substantive provisions of CDPS regulations for groundwater.

If effluent discharge to surface water is necessary during dewatering, the discharge limit requirements of Colorado effluent limitations will be met without treatment at the dewatering locations; otherwise an interim measures CERCLA ARAR waiver will be invoked. Similarly, the substantive provisions of the CDPS regulations will be met; otherwise an interim measures CERCLA ARAR waiver will be invoked.

**Interim Local Waste Management:** Mine wastes at the Site were derived directly or indirectly from the extraction of ore and thus will be exempt from management as a RCRA hazardous waste (i.e., the Bevill exemption), thus mine wastes will be classified as a non-hazardous solid waste.

Pursuant to the Solid Wastes Disposal Sites and Facilities Act, C.R.S. § 30-20-102(4), mining operations including reclamation activities with approved reclamation plans under an MLRB permit may dispose of solid wastes generated by such operations within the permitted area without obtaining a Certificate of Designation. CDPHE interprets this provision to exempt CERCLA response actions performed consistently with MLRB regulation 2 CCR 407-1 Rule 3 (Reclamation Performance Standards) to be compliant with Colorado's regulations pertaining to solid waste disposal.

All waste handling and disposal activities under the selected interim remedy will be performed in accordance with substantive requirements of the relevant and appropriate subparts of MLRB regulation 2 CCR 407-1 Rule 3 (Reclamation Performance Standards), which will allow the selected interim remedy to be compliant with substantive requirements of the Colorado Solid Waste Disposal Sites and Facilities Regulations.

Grading of wastes for interim local management will be performed to meet relevant and appropriate substantive requirements of 2 CCR 407-1 Rule 3.

**Surface Reclamation:** Surface reclamation activities under the selected interim remedy, including grading, will be performed to meet relevant and appropriate substantive requirements of 2 CCR 407-1 Rule 3.

**Construction Activities:** Cultural resource surveys have not been completed for all mining-related sources addressed by the selected interim remedy. If any cultural resources are found, surveys will be necessary to determine if adverse effects will occur, and if so, how the effects may be minimized or mitigated in accordance with the National Historic Preservation Act, Archaeological and Historic Preservation Act, and Historic Sites Act.

If bald or golden eagles are observed during remedial design and IRA, activities must be modified and conducted to conserve the species and their habitat to comply with the substantive requirements of the Bald and Golden Eagle Protection Act.

If the IRA involves activities modifying streams or water bodies that affect wildlife and/or non-game fish, federal agencies must comply with substantive requirements identified by USFWS and the relevant state agency with jurisdiction over wildlife resources in accordance with Fish and Wildlife Coordination Act and implementing regulations.

If threatened or endangered species are identified at these mining-related sources during remedial design and IRA, activities must be modified and conducted to conserve the species and their habitat in accordance with the Endangered Species Act and relevant and appropriate substantive requirements of 40 CFR 257.

If migratory birds are identified during remedial design and IRA, activities must be modified and conducted to conserve the species and their habitat in accordance with the Migratory Bird Treaty Act.

The mine portal pond sediments selected interim remedy will not be conducted within streams. However, if activities were to impact streams, they will be carried out in a manner to avoid adversely affecting wildlife and/or non-game fish within streams. Compliance will be achieved through coordination with the Colorado Division of Parks Wildlife and in accordance with the Colorado Wildlife Enforcement and Penalties Act and Colorado Non-game, Endangered, or Threatened Species Act.

It is not anticipated that nests or dens of wildlife exist at the mine locations. If they were to be encountered, the selected interim remedy will be implemented to avoid disturbing or destroying nests or dens. Compliance will be achieved through coordination with the Colorado Division of Parks Wildlife and in accordance with substantive requirements of Colorado Wildlife Commission regulations.

Planning for activities conducted during the IRA on USFS-managed land, such as obtaining borrow material and implementing the IRA at the Brooklyn Mine, will consider pertinent information provided within the San Juan National Forest and Tres Rios Field Office Land and Resource Management Plan.

If the IRA involves activities that affect identified floodplains or wetlands, activities will be carried out in a manner to avoid adversely affecting them and thus meet the substantive

requirements of the Clean Water Act, Section 404 regulations, 40 CFR Part 6, Appendix A, and relevant and appropriate substantive requirements of 40 CFR 257.

Activities under the selected interim remedy will be carried out in a manner that will comply with Colorado Noise Abatement Statute 25-12-103.

#### **14.3.2.3 ARAR Waivers**

Compliance with certain ARARs may not be possible for components of the mine portal MIW discharges selected interim remedy since they are interim in scope and do not address all contaminated media posing unacceptable human health and ecological risks. Thus, the CERCLA interim measures waiver is the most pertinent to the selected interim remedy and the only CERCLA ARAR waiver identified in this IROD.

Blanket use of the CERCLA interim measures waiver will occur where the expectation is that regardless of the conditions (i.e., the particular IRA, activity within the IRA, and/or mining-related source location) that the ARAR will not be complied with and thus the waiver is invoked on a blanket basis. The ARARs that will fall under blanket waiver use include:

- Federal
  - Clean Water Act 33 U.S.C. §§ 1342, et seq., Point Source Discharges Requirements, Section 402
- State of Colorado
  - Colorado Basic Standards for Groundwater, 5 CCR 1002-41, pursuant to C.R.S. §§ 25-8-101-703
  - Colorado Surface Water Quality Classifications and Numeric Standards, 5 CCR 1002-34, pursuant to C.R.S. §§ 25-8-203 and 204
  - CDPS Regulations, 5 CCR 1002-61, Regulation No. 61, pursuant to C.R.S. § 25-8-501 -509
  - Colorado Effluent Limitations, 5 CCR 1002-62, pursuant to C.R.S. § 25-8-205

#### **14.3.3 Cost Effectiveness**

The mine portal pond sediments selected interim remedy is cost effective and represents a reasonable value for the money to be spent. In making this determination, the following definition was used: “A remedy shall be cost effective if its costs are proportional to its overall effectiveness” [NCP §300.430(f)(1)(ii)(D)]. This is determined by evaluating the overall effectiveness of the selected interim remedy and comparing that effectiveness to the overall costs. Effectiveness is evaluated by examining how the remedy meets three criteria: long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness. Overall effectiveness of the remedial alternatives was compared to costs to determine cost effectiveness. The relationship of the overall effectiveness of the mine



portal pond sediments selected interim remedy was determined to be proportional to its cost, and hence this remedy represents a reasonable value for the cost to be incurred.

The cost of the mine portal pond sediments selected interim remedy is expected to have a present value cost of approximately \$3,384,000. Compared to the other alternative considered (No Action), the mine portal pond sediments selected interim remedy has a higher cost, but it is the only alternative expected to provide protection of human health and the environment as an interim measure. EPA believes the mine portal pond sediments selected interim remedy achieves an appropriate balance between cost effectiveness and adequate protectiveness.

#### **14.3.4 Utilization of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to the Maximum Extent Practicable**

This determination looks at whether the selected interim remedy provides the best balance of tradeoffs among the alternatives with respect to the balancing criteria set forth in NCP §300.430(f)(1)(i)(B) such that it represents the maximum extent to which permanence and treatment can be practicably used at the Site. NCP §300.430(f)(1)(ii)(E) provides that the balancing shall emphasize the factors of “long-term effectiveness” and “reduction of toxicity, mobility, or volume through treatment,” and shall consider the preference for treatment and bias against off-site disposal. The modifying criteria were also considered in making this determination.

The mine portal pond sediments selected interim remedy is an interim solution only, and is not intended to use permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable. Permanent solutions and alternative treatment technologies or resource recovery technologies will be addressed as part of the final response action.

#### **14.3.5 Preference for Treatment as a Principal Element**

This determination looks at whether the selected interim remedy provides treatment as a principal element. The NCP establishes the expectation that treatment will be used to address principal threat wastes whenever practicable (40 CFR 300.430[a][1][iii][A]). Principal threat wastes are those source materials that are considered to be highly toxic or highly mobile that generally cannot be contained in a reliable manner or will present a significant risk to human health and the environment should exposure occur. As discussed in Section 11.0 of this IROD, EPA has determined that media addressed by this IRA do not involve principal threat waste. In addition, because this action does not constitute the final remedy, the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element will be considered and addressed by the final response action.

#### **14.3.6 Five-Year Site Reviews**

While the Site-wide risk assessment is ongoing, it is assumed that the mine portal pond sediments selected interim remedy will not result in unlimited use and unrestricted exposure land use scenarios. Therefore, five-year reviews pursuant to CERCLA §121(c) and NCP §300.430(f)(5)(iii)(C) are assumed to be conducted for the mining-related sources included as part of this selected interim remedy in conjunction with sources addressed by other response actions as part of Site-wide activities. EPA shall conduct a review of remedial actions no less

often than each 5 years after the initiation of such remedial action to ensure the remedy is, or will be, protective of human health and the environment.

#### **14.4 IN-STREAM MINE WASTES**

The following subsections discuss the statutory determinations for the in-stream mine wastes IRA of the selected interim remedy.

##### **14.4.1 Protection of Human Health and the Environment**

The in-stream mine wastes selected interim remedy will provide protection of human health and the environment in a short term and is intended to provide adequate protection until a final remedy is selected. It will provide stabilization of the mining-related sources and prevent further environmental degradation. The in-stream mine wastes selected interim remedy achieves RAO 1 by excavating in-stream mine wastes that impede flow or are susceptible to erosion or leaching of contaminants and formation of MIW and reduces transport of particulates containing COPCs to surface water, which contribute to unacceptable ecological risks. EPA will measure the extent by which ecological risks associated with contributions from in-stream mine waste have been reduced by the in-stream mine wastes selected interim remedy.

##### **14.4.2 Compliance with ARARs**

###### **14.4.2.1 Chemical-Specific ARARs**

Chemical-specific ARARs will be pertinent to the in-stream mine wastes selected interim remedy. State water quality standards will likely not be met for streams after removal of in-stream mine wastes due to other contributing mining-related sources, thus the interim measures CERCLA ARAR waiver will be invoked for the Colorado Basic Standards and Methodologies for Surface Water. The Colorado Basic Standards for Groundwater will also be waived using an interim measures CERCLA ARAR waiver because the limited RI information available does not indicate that groundwater meeting the regulatory definition exists beneath the mining-related sources addressed by the selected interim remedy.

###### **14.4.2.2 Location- and Action-Specific ARARs**

Location- and action-specific ARARs for the selected interim remedy will be addressed during implementation of the IRA as indicated in the following paragraphs.

**Excavation:** The excavation of mine wastes from waters of the United States is assumed to be performed with neat excavation only involving incidental fallback. Thus, the substantive requirements of Section 404 will not be triggered. If grading or excavation activities result in a discharge of dredge material, the substantive requirements of Nationwide Permit 20 (Response Operations for Oil or Hazardous Substances) will be met.

**Dust Suppression:** Dust suppression and emission-controlled equipment will be used during construction activities for the selected interim remedy to achieve compliance with Colorado Emission Control requirements.

**Dewatering:** If effluent discharge to surface water is necessary during dewatering activities,, activities would be conducted in a way to minimize infiltration into the ground surface that could cause additional degradation of groundwater. Because the groundwater, as defined in 5 CCR 1002-41, is not known to be present below the mining-related sources, an interim measures CERCLA ARAR waiver will be invoked. An interim measures CERCLA ARAR waiver will also be invoked to waive the substantive provisions of Colorado Effluent Limitations and CDPS regulations for groundwater.

If effluent discharge to surface water is necessary during dewatering, the discharge limit requirements of Colorado Effluent Limitations will be met without treatment at the dewatering locations; otherwise an interim measures CERCLA ARAR waiver will be invoked. Similarly, the substantive provisions of the CDPS regulations will be met; otherwise an interim measures CERCLA ARAR waiver will be invoked.

**Interim Local Waste Management:** Mine wastes at the Site were derived directly or indirectly from the extraction of ore and thus will be exempt from management as a RCRA hazardous waste (i.e., the Bevill exemption), thus mine wastes will be classified as a non-hazardous solid waste.

Pursuant to the Solid Wastes Disposal Sites and Facilities Act, C.R.S. § 30-20-102(4), mining operations including reclamation activities with approved reclamation plans under an MLRB permit may dispose of solid wastes generated by such operations within the permitted area without obtaining a Certificate of Designation. CDPHE interprets this provision to exempt CERCLA response actions performed consistently with MLRB regulation 2 CCR 407-1 Rule 3 (Reclamation Performance Standards) to be compliant with Colorado's regulations pertaining to solid waste disposal.

All waste handling and disposal activities under the selected interim remedy will be performed in accordance with substantive requirements of the relevant and appropriate subparts of MLRB regulation 2 CCR 407-1 Rule 3 (Reclamation Performance Standards), which will allow the selected interim remedy to be compliant with substantive requirements of the Colorado Solid Waste Disposal Sites and Facilities Regulations.

Grading of wastes for interim local management will be performed to meet relevant and appropriate substantive requirements of 2 CCR 407-1 Rule 3.

**Surface Reclamation:** Surface reclamation activities under the selected interim remedy, including grading, will be performed to meet relevant and appropriate substantive requirements of 2 CCR 407-1 Rule 3.

**Construction Activities:** Cultural resource surveys have not been completed for all mining-related sources addressed by the selected interim remedy. If any cultural resources are found, surveys will be necessary to determine if adverse effects will occur, and if so, how the effects may be minimized or mitigated in accordance with the National Historic Preservation Act, Archaeological and Historic Preservation Act, and Historic Sites Act.

If bald or golden eagles are observed during remedial design and IRA, activities must be modified and conducted to conserve the species and their habitat to comply with the substantive requirements of the Bald and Golden Eagle Protection Act.

If the IRA involves activities modifying streams or water bodies that affect wildlife and/or non-game fish, federal agencies must comply with substantive requirements identified by USFWS and the relevant state agency with jurisdiction over wildlife resources in accordance with Fish and Wildlife Coordination Act and implementing regulations.

If threatened or endangered species are identified at these mining-related sources during remedial design and IRA, activities must be modified and conducted to conserve the species and their habitat in accordance with the Endangered Species Act and relevant and appropriate substantive requirements of 40 CFR 257.

If migratory birds are identified during remedial design and IRA, activities must be modified and conducted to conserve the species and their habitat in accordance with the Migratory Bird Treaty Act.

If activities were to impact streams, they will be carried out in a manner to avoid adversely affecting wildlife and/or non-game fish within streams. Compliance will be achieved through coordination with the Colorado Division of Parks Wildlife and in accordance with the Colorado Wildlife Enforcement and Penalties Act and Colorado Non-game, Endangered, or Threatened Species Act.

It is not anticipated that nests or dens of wildlife exist at the mine locations. If they were to be encountered, the selected interim remedy will be implemented to avoid disturbing or destroying nests or dens. Compliance will be achieved through coordination with the Colorado Division of Parks Wildlife and in accordance with substantive requirements of Colorado Wildlife Commission regulations.

Planning for activities conducted during the IRA on USFS-managed land, such as obtaining borrow material, will consider pertinent information provided within the San Juan National Forest and Tres Rios Field Office Land and Resource Management Plan.

If the IRA involves activities that affect identified floodplains or wetlands, activities will be carried out in a manner to avoid adversely affecting them and thus meet the substantive requirements of the Clean Water Act, Section 404 regulations, 40 CFR Part 6, Appendix A, and relevant and appropriate substantive requirements of 40 CFR 257.

Activities under the selected interim remedy will be carried out in a manner that will comply with Colorado Noise Abatement Statute 25-12-103.

#### **14.4.2.3 ARAR Waivers**

Compliance with certain ARARs may not be possible for components of the mine portal MIW discharges selected interim remedy since they are interim in scope and do not address all contaminated media posing unacceptable human health and ecological risks. Thus, the CERCLA

interim measures waiver is the most pertinent to the selected interim remedy and the only CERCLA ARAR waiver identified in this IROD.

Blanket use of the CERCLA interim measures waiver will occur where the expectation is that regardless of the conditions (i.e., the particular IRA, activity within the IRA, and/or mining-related source location) that the ARAR will not be complied with and thus the waiver is invoked on a blanket basis. The ARARs that will fall under blanket waiver use include:

- Federal
  - Clean Water Act 33 U.S.C. §§ 1342, et seq., Point Source Discharges Requirements, Section 402
- State of Colorado
  - Colorado Basic Standards for Groundwater, 5 CCR 1002-41, pursuant to C.R.S. §§ 25-8-101-703
  - Colorado Surface Water Quality Classifications and Numeric Standards, 5 CCR 1002-34, pursuant to C.R.S. §§ 25-8-203 and 204
  - CDPS Regulations, 5 CCR 1002-61, Regulation No. 61, pursuant to C.R.S. § 25-8-501 -509
  - Colorado Effluent Limitations, 5 CCR 1002-62, pursuant to C.R.S. § 25-8-205

#### **14.4.3 Cost Effectiveness**

The in-stream mine wastes selected interim remedy addressing in-stream mine wastes is cost effective and represents a reasonable value for the money to be spent. In making this determination, the following definition was used: “A remedy shall be cost effective if its costs are proportional to its overall effectiveness” [NCP §300.430(f)(1)(ii)(D)]. This is determined by evaluating the overall effectiveness of the selected interim remedy and comparing that effectiveness to the overall costs. Effectiveness is evaluated by examining how the remedy meets three criteria: long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness. Overall effectiveness of the remedial alternatives was compared to costs to determine cost effectiveness. The relationship of the overall effectiveness of the selected interim remedy was determined to be proportional to its cost, and hence this remedy represents a reasonable value for the cost to be incurred.

The cost of the in-stream mine wastes selected interim remedy is expected to have a present value cost of approximately \$512,000. Compared to the other alternative considered (No Action), the in-stream mine wastes selected interim remedy has a higher cost, but it is the only alternative expected to provide protection of human health and the environment as an interim measure. EPA believes the in-stream mine wastes selected interim remedy achieves an appropriate balance between cost effectiveness and adequate protectiveness.

#### **14.4.4 Utilization of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to the Maximum Extent Practicable**

This determination looks at whether the selected interim remedy provides the best balance of tradeoffs among the alternatives with respect to the balancing criteria set forth in NCP §300.430(f)(1)(i)(B) such that it represents the maximum extent to which permanence and treatment can be practicably used at the Site. NCP §300.430(f)(1)(ii)(E) provides that the balancing shall emphasize the factors of “long-term effectiveness” and “reduction of toxicity, mobility, or volume through treatment,” and shall consider the preference for treatment and bias against off-site disposal. The modifying criteria were also considered in making this determination.

This in-stream mine wastes selected interim remedy is an interim solution only, and is not intended to use permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable. Permanent solutions and alternative treatment technologies or resource recovery technologies will be addressed as part of the final response action.

#### **14.4.5 Preference for Treatment as a Principal Element**

This determination looks at whether the selected interim remedy provides treatment as a principal element. The NCP establishes the expectation that treatment will be used to address principal threat wastes whenever practicable (40 CFR 300.430[a][1][iii][A]). Principal threat wastes are those source materials that are considered to be highly toxic or highly mobile that generally cannot be contained in a reliable manner or will present a significant risk to human health and the environment should exposure occur. As discussed in Section 11.0 of this IROD, EPA has determined that media addressed by this IRA do not involve principal threat waste. In addition, because this action does not constitute the final remedy, the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element will be considered and addressed by the final response action.

#### **14.4.6 Five-Year Site Reviews**

While the Site-wide risk assessment is ongoing, it is assumed that the in-stream mine wastes selected interim remedy will not result in unlimited use and unrestricted exposure land use scenarios. Therefore, five-year reviews pursuant to CERCLA §121(c) and NCP §300.430(f)(5)(iii)(C) are assumed to be conducted for the mining-related sources included as part of this selected interim remedy in conjunction with sources addressed by other response actions as part of Site-wide activities. EPA shall conduct a review of remedial actions no less often than each 5 years after the initiation of such remedial action to ensure the remedy is, or will be, protective of human health and the environment.

### **14.5 MINING-IMPACTED RECREATION STAGING AREAS**

The following subsections discuss the statutory determinations for the mining-impacted recreation staging areas IRA of the selected interim remedy.

### **14.5.1 Protection of Human Health and the Environment**

The mining-impacted recreation staging areas selected interim remedy will provide protection of human health and the environment in the short term until a final remedy is selected. It will provide stabilization of the mining-related sources at recreation staging areas, prevent further environmental degradation, and achieve significant risk reduction quickly. The mining-impacted recreation staging areas selected interim remedy addresses RAOs 2 and 3 by containing/isolating mine wastes and contaminated soils within mining-impacted recreation staging areas.

Combinations of aggregate and soil covers will be implemented to reduce disturbances of mine wastes and contaminated soils, and migration of contaminants. The covers will provide an exposure barrier and eliminate surface exposure to mine waste and contaminated soils. The covers will be sloped to promote positive drainage in order to minimize erosion and to reduce infiltration that could saturate the subsurface and compromise the integrity of the covers. The covers used for containment/isolation of mine wastes and contaminated soils could be breached if disturbed, resulting in potential COPC exposures to campers.

### **14.5.2 Compliance with ARARs**

#### **14.5.2.1 Chemical-Specific ARARs**

Chemical-specific ARARs will be pertinent to the mining-impacted recreation staging areas selected interim remedy. State water quality standards will likely not be met for streams after the capping of recreation use areas due to other contributing mining-related sources, thus the interim measures CERCLA ARAR waiver will be invoked for the Colorado Basic Standards and Methodologies for Surface Water. The Colorado Basic Standards for Groundwater will also be waived using an interim measures CERCLA ARAR waiver because the limited RI information available does not indicate that groundwater meeting the regulatory definition exists beneath the mining-related sources addressed by the selected interim remedy.

#### **14.5.2.2 Location- and Action-Specific ARARs**

Location- and action-specific ARARs for the mining-impacted recreation staging areas selected interim remedy will be addressed during implementation of the IRA as indicated in the following paragraphs.

**Cover Placement:** The placement and grading of covers is assumed to be performed without the discharge of dredged or fill materials into the waters of the United States. Thus, the substantive requirements of Section 404 will not be triggered. If grading activities result in a discharge of dredge material, the substantive requirements of Nationwide Permit 20 (Response Operations for Oil or Hazardous Substances) will be met. All cover placement activities will be conducted in a way minimize infiltration, if present, into the ground surface that could cause additional degradation of groundwater. Because the groundwater, as defined in 5 CCR 1002-41, is not known to be present below the mining-related sources, an interim measures CERCLA ARAR waiver will be invoked. An interim measures CERCLA ARAR waiver will also be invoked to waive the substantive provisions of Colorado Effluent Limitations and CDPS regulations for groundwater. For channelized stormwater discharges from covers, the substantive provisions of the CDPS program will be met; otherwise an interim measures CERCLA ARAR waiver will be invoked. During construction of the covers, the discharge limit requirements of Colorado effluent

limitations will be met without treatment; otherwise an interim measures CERCLA ARAR waiver will be invoked.

**Surface Reclamation:** Surface reclamation activities under the selected interim remedy, including grading, will be performed to meet relevant and appropriate substantive requirements of 2 CCR 407-1 Rule 3. During construction and seeding of covers, compliance will be achieved through completion of noxious weed surveys and coordination with the Colorado Division of Parks Wildlife and in accordance with Colorado Noxious Weed Act and the San Juan County Noxious Weed regulations.

**Dust Suppression:** Dust suppression and emission-controlled equipment will be used during construction activities for the selected interim remedy to achieve compliance with Colorado Emission Control regulations.

**Construction Activities:** Cultural resource surveys have not been completed for all mining-related sources addressed by the selected interim remedy. If any cultural resources are found, surveys will be necessary to determine if adverse effects will occur, and if so, how the effects may be minimized or mitigated in accordance with the National Historic Preservation Act, Archaeological and Historic Preservation Act, and Historic Sites Act.

If bald or golden eagles are observed during remedial design and IRA, activities must be modified and conducted to conserve the species and their habitat to comply with the substantive requirements of the Bald and Golden Eagle Protection Act.

If the IRA involves activities modifying streams or water bodies that affect wildlife and/or non-game fish, federal agencies must comply with substantive requirements identified by USFWS and the relevant state agency with jurisdiction over wildlife resources in accordance with Fish and Wildlife Coordination Act and implementing regulations.

If threatened or endangered species are identified at these mining-related sources during remedial design and IRA, activities must be modified and conducted to conserve the species and their habitat in accordance with the Endangered Species Act and relevant and appropriate substantive requirements of 40 CFR 257.

If migratory birds are identified during remedial design and IRA, activities must be modified and conducted to conserve the species and their habitat in accordance with the Migratory Bird Treaty Act.

The mining-impacted recreation staging areas selected interim remedy will not be conducted within streams. However, if activities were to impact streams, they will be carried out in a manner to avoid adversely affecting wildlife and/or non-game fish within streams. Compliance will be achieved through coordination with the Colorado Division of Parks Wildlife and in accordance with the Colorado Wildlife Enforcement and Penalties Act and Colorado Non-game, Endangered, or Threatened Species Act.

It is not anticipated that nests or dens of wildlife exist at the mine locations. If they were to be encountered, the selected interim remedy will be implemented to avoid disturbing or destroying nests or dens. Compliance will be achieved through coordination with the Colorado Division of



Parks Wildlife and in accordance with substantive requirements of Colorado Wildlife Commission regulations.

Planning for activities conducted during the IRA on USFS-managed land, such as obtaining borrow material, will consider pertinent information provided within the San Juan National Forest and Tres Rios Field Office Land and Resource Management Plan.

If the selected interim remedy involves activities that affect identified floodplains or wetlands, activities will be carried out in a manner to avoid adversely affecting them and thus meet the substantive requirements of the Clean Water Act, Section 404 regulations, 40 CFR Part 6, Appendix A, and relevant and appropriate substantive requirements of 40 CFR 257.

Activities under the selected interim remedy will be carried out in a manner that will comply with Colorado Noise Abatement Statute 25-12-103.

### **14.5.2.3 ARAR Waivers**

Compliance with certain ARARs may not be possible for components of the mine portal MIW discharges selected interim remedy since they are interim in scope and do not address all contaminated media posing unacceptable human health and ecological risks. Thus, the CERCLA interim measures waiver is the most pertinent to the selected interim remedy and the only CERCLA ARAR waiver identified in this IROD.

Blanket use of the CERCLA interim measures waiver will occur where the expectation is that regardless of the conditions (i.e., the particular IRA, activity within the IRA, and/or mining-related source location) that the ARAR will not be complied with and thus the waiver is invoked on a blanket basis. The ARARs that will fall under blanket waiver use include:

- Federal
  - Clean Water Act 33 U.S.C. §§ 1342, et seq., Point Source Discharges Requirements, Section 402
- State of Colorado
  - Colorado Basic Standards for Groundwater, 5 CCR 1002-41, pursuant to C.R.S. §§ 25-8-101-703
  - Colorado Surface Water Quality Classifications and Numeric Standards, 5 CCR 1002-34, pursuant to C.R.S. §§ 25-8-203 and 204
  - CDPS Regulations, 5 CCR 1002-61, Regulation No. 61, pursuant to C.R.S. § 25-8-501 -509
  - Colorado Effluent Limitations, 5 CCR 1002-62, pursuant to C.R.S. § 25-8-205

### **14.5.3 Cost Effectiveness**

The mining-impacted recreation staging areas selected interim remedy is cost effective and represents a reasonable value for the money to be spent. In making this determination, the following definition was used: “A remedy shall be cost effective if its costs are proportional to its overall effectiveness” [NCP §300.430(f)(1)(ii)(D)]. This is determined by evaluating the overall effectiveness of the selected interim remedy and comparing that effectiveness to the overall costs. Effectiveness is evaluated by examining how the remedy meets three criteria: long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness. Overall effectiveness of the remedial alternatives was compared to costs to determine cost effectiveness. The relationship of the overall effectiveness of the mining-impacted recreation staging areas selected interim remedy was determined to be proportional to its cost, and hence this remedy represents a reasonable value for the cost to be incurred.

The cost of the mining-impacted recreation staging areas portion of the mining-impacted recreation staging areas selected interim remedy is expected to have a present value cost of approximately \$1,668,000. Compared to the other alternative considered (No Action), the mining-impacted recreation staging areas selected interim remedy has a higher cost, but it is the only alternative expected to provide protection of human health and the environment as an interim measure. EPA believes the mining-impacted recreation staging areas selected interim remedy achieves an appropriate balance between cost effectiveness and adequate protectiveness.

### **14.5.4 Utilization of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to the Maximum Extent Practicable**

This determination looks at whether the selected interim remedy provides the best balance of tradeoffs among the alternatives with respect to the balancing criteria set forth in NCP §300.430(f)(1)(i)(B) such that it represents the maximum extent to which permanence and treatment can be practicably used at the Site. NCP §300.430(f)(1)(ii)(E) provides that the balancing shall emphasize the factors of “long-term effectiveness” and “reduction of toxicity, mobility, or volume through treatment,” and shall consider the preference for treatment and bias against off-site disposal. The modifying criteria were also considered in making this determination.

The mining-impacted recreation staging areas selected interim remedy is an interim solution only, and is not intended to use permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable. Permanent solutions and alternative treatment technologies or resource recovery technologies will be addressed as part of the final response action.

### **14.5.5 Preference for Treatment as a Principal Element**

This determination looks at whether the selected interim remedy provides treatment as a principal element. The NCP establishes the expectation that treatment will be used to address principal threat wastes whenever practicable (40 CFR 300.430[a][1][iii][A]). Principal threat wastes are those source materials that are considered to be highly toxic or highly mobile that generally cannot be contained in a reliable manner or will present a significant risk to human health and the environment should exposure occur. As discussed in Section 11.0 of this IROD,

EPA has determined that media addressed by this IRA do not involve principal threat waste. In addition, because this action does not constitute the final remedy, the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element will be considered and addressed by the final response action.

#### **14.5.6 Five-Year Site Reviews**

While the Site-wide risk assessment is ongoing, it is assumed that the mining-impacted recreation staging areas selected interim remedy will not result in unlimited use and unrestricted exposure land use scenarios. Therefore, five-year reviews pursuant to CERCLA §121(c) and NCP §300.430(f)(5)(iii)(C) are assumed to be conducted for the mining-related sources included as part of this selected interim remedy in conjunction with sources addressed by other response actions as part of Site-wide activities. EPA shall conduct a review of remedial actions no less often than each 5 years after the initiation of such remedial action to ensure the remedy is, or will be, protective of human health and the environment.

## **15.0 DOCUMENTATION OF SIGNIFICANT CHANGES**

The proposed plan for IRAs for the Site was released for public comment in June 2018. It identified Alternative A2 as the preferred alternative for mine portal MIW discharges, Alternative B2 as the preferred alternative for mining-related source/stormwater interactions, Alternative C2 as the preferred alternative for mine portal pond sediments, Alternative D2 as the preferred alternative for in-stream mine wastes, and Alternative E2 as the preferred alternative for mining-impacted recreation staging areas. Those alternatives are described in Section 12.0 of this IROD as the selected interim remedy.

The public comment period was extended from 30 to 60 days, and EPA reviewed all written and verbal comments submitted during that comment period. It was determined that no significant changes to the remedy, as originally identified in the proposed plan, were necessary. It should be noted, however, that addenda to the preliminary RI and the risk assessment information are included in Appendices A and B, respectively, of this IROD. In addition, final identification of ARARs pertaining to the selected interim remedy have been made, as presented in Appendix C.

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## **TABLES**



**Table 9-1A****Matrix of Process Options for Mine Portal MIW Discharges Alternative Development***Bonita Peak Mining District Superfund Site*

General Response Action	Remedial Technology	Process Option	Alternative A1	Alternative A2
			No Action	Diversion/Isolation
No Action	None	None	✓	
Institutional Controls	Non-Engineered Controls	Governmental Controls, Proprietary Controls, Enforcement Tools with IC Components, and Informational Devices		✓
Containment	Surface Source Controls	Grading		✓
		Soil/Rock Exposure Barrier		
	Hydraulic Isolation, Diversion, and Separation Measures	French Drain and/or Interception Trench		✓
		Open Channel		✓
		Collection/Diversion Piping or Liner		✓
		Berms		✓
Removal, Transport, Disposal	Removal	Mechanical Excavation (Excavation)		
		Pneumatic Excavation (Vacuum Extraction)		
	Transport	Mechanical Transport (Hauling/Conveying)		
		Pneumatic Transport (Vacuum Extraction)		
	Disposal	Interim Local Waste Management		

**Notes:**

- Exhibit 9-1 summarizes all technology process options identified for all media. Check marks in the table above indicated process options that will be implemented as necessary for each alternative for mine portal MIW discharges as defined in Section 9.
- For purposes of FS evaluation, representative process options are selected for evaluation within the remedial technology category to simplify the analysis and comparison of alternatives, as described in Section 9.2.

**Table 9-1B****Matrix of Process Options for Mining-Related Source/Stormwater Interactions Alternative Development***Bonita Peak Mining District Superfund Site*

General Response Action	Remedial Technology	Process Option	Alternative B1	Alternative B2
			No Action	Stormwater Diversion/Isolation
No Action	None	None	✓	
Institutional Controls	Non-Engineered Controls	Governmental Controls, Proprietary Controls, Enforcement Tools with IC Components, and Informational Devices		✓
Containment	Surface Source Controls	Grading		✓
		Soil/Rock Exposure Barrier		
	Hydraulic Isolation, Diversion, and Separation Measures	French Drain and/or Interception Trench		✓
		Open Channel		✓
		Collection/Diversion Piping or Liner		✓
		Berms		✓
Removal, Transport, Disposal	Removal	Mechanical Excavation (Excavation)		
		Pneumatic Excavation (Vacuum Extraction)		
	Transport	Mechanical Transport (Hauling/Conveying)		
		Pneumatic Transport (Vacuum Extraction)		
	Disposal	Interim Local Waste Management		

**Notes:**

- Exhibit 9-1 summarizes all technology process options identified for all media. Check marks in the table above indicated process options that will be implemented as necessary for each alternative for mining-related source/stormwater interactions as defined in Section 9.
- For purposes of FS evaluation, representative process options are selected for evaluation within the remedial technology category to simplify the analysis and comparison of alternatives, as described in Section 9.2.

**Table 9-1C****Matrix of Process Options for Mine Portal Pond Sediments Alternative Development***Bonita Peak Mining District Superfund Site*

General Response Action	Remedial Technology	Process Option	Alternative C1	Alternative C2
			No Action	Excavation and Interim Local Waste Management
No Action	None	None	✓	
Institutional Controls	Non-Engineered Controls	Governmental Controls, Proprietary Controls, Enforcement Tools with IC Components, and Informational Devices		✓
Containment	Surface Source Controls	Grading		✓
		Soil/Rock Exposure Barrier		
	Hydraulic Isolation, Diversion, and Separation Measures	French Drain and/or Interception Trench		
		Open Channel		
		Collection/Diversion Piping or Liner		
		Berms		✓
Removal, Transport, Disposal	Removal	Mechanical Excavation (Excavation)		✓
		Pneumatic Excavation (Vacuum Extraction)		✓
	Transport	Mechanical Transport (Hauling/Conveying)		✓
		Pneumatic Transport (Vacuum Extraction)		✓
	Disposal	Interim Local Waste Management		✓

**Notes:**

- Exhibit 9-1 summarizes all technology process options identified for all media. Check marks in the table above indicated process options that will be implemented as necessary for each alternative for mine portal pond sediments as defined in Section 9.
- For purposes of FS evaluation, representative process options are selected for evaluation within the remedial technology category to simplify the analysis and comparison of alternatives, as described in Section 9.2.

**Table 9-1D****Matrix of Process Options for In-Stream Mine Wastes Alternative Development***Bonita Peak Mining District Superfund Site*

General Response Action	Remedial Technology	Process Option	Alternative D1	Alternative D2
			No Action	Excavation and Interim Local Waste Management
No Action	None	None	✓	
Institutional Controls	Non-Engineered Controls	Governmental Controls, Proprietary Controls, Enforcement Tools with IC Components, and Informational Devices		✓
Containment	Surface Source Controls	Grading		✓
		Soil/Rock Exposure Barrier		
	Hydraulic Isolation, Diversion, and Separation Measures	French Drain and/or Interception Trench		
		Open Channel		
		Collection/Diversion Piping or Liner		
		Berms		✓
Removal, Transport, Disposal	Removal	Mechanical Excavation (Excavation)		✓
		Pneumatic Excavation (Vacuum Extraction)		✓
	Transport	Mechanical Transport (Hauling/Conveying)		✓
		Pneumatic Transport (Vacuum Extraction)		✓
	Disposal	Interim Local Waste Management		✓

**Notes:**

- Exhibit 9-1 summarizes all technology process options identified for all media. Check marks in the table above indicated process options that will be implemented as necessary for each alternative for in-stream mine wastes as defined in Section 9.
- For purposes of FS evaluation, representative process options are selected for evaluation within the remedial technology category to simplify the analysis and comparison of alternatives, as described in Section 9.2.

**Table 9-1E****Matrix of Process Options for Mining-Impacted Recreation Staging Areas Alternative Development***Bonita Peak Mining District Superfund Site*

General Response Action	Remedial Technology	Process Option	Alternative E1	Alternative E2
			No Action	Containment/Isolation
No Action	None	None	✓	
Institutional Controls	Non-Engineered Controls	Governmental Controls, Proprietary Controls, Enforcement Tools with IC Components, and Informational Devices		✓
Containment	Surface Source Controls	Grading		✓
		Soil/Rock Exposure Barrier		✓
	Hydraulic Isolation, Diversion, and Separation Measures	French Drain and/or Interception Trench		
		Open Channel		
		Collection/Diversion Piping or Liner		
		Berms		
Removal, Transport, Disposal	Removal	Mechanical Excavation (Excavation)		
		Pneumatic Excavation (Vacuum Extraction)		
	Transport	Mechanical Transport (Hauling/Conveying)		
		Pneumatic Transport (Vacuum Extraction)		
	Disposal	Interim Local Waste Management		

**Notes:**

- Exhibit 9-1 summarizes all technology process options identified for all media. Check marks in the table above indicated process options that will be implemented as necessary for each alternative for mining-impacted recreation staging areas as defined in Section 9.
- For purposes of FS evaluation, representative process options are selected for evaluation within the remedial technology category to simplify the analysis and comparison of alternatives, as described in Section 9.2.

Table 12-1A: Cost Estimate Summary for Mine Portal MIW Discharges IRA for the Selected Interim Remedy

CAPITAL COSTS: (Assumed to be Incurred During Year 0)						
DESCRIPTION	QTY	UNIT(S)	UNIT COST	TOTAL		
Institutional Controls	1	LS	\$8,599	\$8,599		
Mobilization/Demobilization	1	LS	\$35,678	\$35,678		
Installation of Diversion/Isolation Components						
Nonconventional Access-Alpine Locations	1	LS	\$12,447	\$12,447		
Nonconventional Access-Subalpine Locations	1	LS	\$35,936	\$35,936		
Conventional Access-Subalpine Locations	1	LS	\$7,397	\$7,397		
Repairs of Existing Diversion/Isolation Components	1	LS	\$32,575	\$32,575		
Excavation, Dewatering, and Management of Mine Waste at Local Interim Management Areas	30	BCY	\$66	\$1,994		
Access Road Improvements	5,300	LF	\$46	\$243,812		
Development of Borrow Materials	3,160	BCY	\$28	\$88,010		
Transportation of Borrow Materials	3,640	LCY	\$27	\$97,362		
Dust Control	1	LS	\$48,065	\$48,065		
Erosion Control and Reclamation of Areas Disturbed during Construction	1	LS	\$15,641	\$15,641		
SUBTOTAL				\$627,516		
Contingency (Scope and Bid)	30%			\$188,255		
SUBTOTAL				\$815,771		
Project Management	6%			\$48,946		
Remedial Design	12%			\$97,893		
Construction Management	8%			\$65,262		
TOTAL				\$1,027,872		
TOTAL CAPITAL COST				\$1,028,000		
ANNUAL O&M COSTS (Assumed to be Incurred Annually During Year 1 through 15)						
DESCRIPTION	QTY	UNIT(S)	UNIT COST	TOTAL		
Inspection of Remedial Components	1	LS	\$8,209	\$8,209		
Surface Water Monitoring	2	EA	\$41,854	\$83,707		
SUBTOTAL				\$91,916		
Contingency (Scope and Bid)	20%			\$18,383		
SUBTOTAL				\$110,299		
Project Management	8%			\$8,824		
TOTAL				\$119,123		
TOTAL ANNUAL O&M COST				\$119,000		
PERIODIC O&M COSTS (Assumed to be Incurred Once Every 2 Years During Year 1 through 15)						
DESCRIPTION	QTY	UNIT(S)	UNIT COST	TOTAL		
Post-Construction Maintenance	1	LS	\$31,273	\$31,273		
SUBTOTAL				\$31,273		
Contingency (Scope and Bid)	20%			\$6,255		
SUBTOTAL				\$37,528		
Project Management	10%			\$3,753		
TOTAL				\$41,281		
TOTAL PERIODIC O&M COST				\$41,000		
Summary of Present Value Analysis						
Year <sup>1</sup>	Capital Costs	Annual O&M Costs	Periodic O&M Costs	Total Annual Expenditure <sup>2</sup>	Discount Factor (7.0%)	Present Value <sup>3</sup>
0	\$1,028,000	\$0	\$0	\$1,028,000	1.0000	\$1,028,000
1	\$0	\$119,000	\$0	\$119,000	0.9346	\$111,217
2	\$0	\$119,000	\$41,000	\$160,000	0.8734	\$139,744
3	\$0	\$119,000	\$0	\$119,000	0.8163	\$97,140
4	\$0	\$119,000	\$41,000	\$160,000	0.7629	\$122,064
5	\$0	\$119,000	\$0	\$119,000	0.713	\$84,847
6	\$0	\$119,000	\$41,000	\$160,000	0.6663	\$106,608
7	\$0	\$119,000	\$0	\$119,000	0.6227	\$74,101
8	\$0	\$119,000	\$41,000	\$160,000	0.582	\$93,120
9	\$0	\$119,000	\$0	\$119,000	0.5439	\$64,724
10	\$0	\$119,000	\$41,000	\$160,000	0.5083	\$81,328
11	\$0	\$119,000	\$0	\$119,000	0.4751	\$56,537
12	\$0	\$119,000	\$41,000	\$160,000	0.444	\$71,040
13	\$0	\$119,000	\$0	\$119,000	0.415	\$49,385
14	\$0	\$119,000	\$41,000	\$160,000	0.3878	\$62,048
15	\$0	\$119,000	\$0	\$119,000	0.3624	\$43,126
TOTALS:	\$1,028,000	\$1,785,000	\$287,000	\$3,100,000		\$2,285,029
TOTAL PRESENT VALUE OF SELECTED REMEDY <sup>4</sup>						\$2,285,000
Notes:						
<sup>1</sup> The period of analysis for the selected remedy is assumed to be 15 years post construction.						
<sup>2</sup> Total annual expenditure is the total cost per year with no discounting.						
<sup>3</sup> Present value cost by year is the total annual expenditure discounted by a factor for that year representing the 7.0% real discount rate recommended by "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", EPA 2000.						
<sup>4</sup> Total present value is rounded to the nearest \$1,000. Inflation and depreciation are excluded from the present value cost.						
Costs presented for this alternative are expected to have an accuracy between -30% to +50% of actual costs, based on the scope presented.						
Percentages used for contingency and professional/technical services costs are based on guidance from Section 5.0 of "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", EPA 2000.						
Costs presented are expected to have an accuracy between -30% to +50% of actual costs, based on the scope presented. They are prepared solely for remedy selection and not for remedial design.						
Unit costs represent total cost divided by the estimated quantity for each item and are rounded to the nearest whole number. Due to the rounding in the unit costs, multiplying the estimated quantity by unit cost may not exactly equal the total cost.						
Abbreviations:						
BCY	Bank Cubic Yard					
EA	Each					
LF	Linear Feet					
LCY	Loose Cubic Yard					
LS	Lump Sum					

Table 12-1B: Cost Estimate Summary for Mine Portal MIW Discharges IRA for the Selected Interim Remedy – Brooklyn Mine

CAPITAL COSTS: (Assumed to be Incurred During Year 0)						
DESCRIPTION	QTY	UNIT(S)	UNIT COST	TOTAL		
Institutional Controls <sup>1</sup>	1	LS	\$1,075	\$1,075		
Mobilization/Demobilization	1	LS	\$10,860	\$10,860		
Installation of Diversion/Isolation Components	1	LS	\$8,801	\$8,801		
Repairs of Existing Diversion/Isolation Components	1	LS	\$9,938	\$9,938		
Excavation, Dewatering, and Management of Mine Waste at Local Interim Management Areas	27	BCY	\$77	\$2,081		
Access Road Improvements	1	LS	\$6,250	\$6,250		
Development of Borrow Materials	160	BCY	\$47	\$7,454		
Transportation of Borrow Materials	200	LCY	\$26	\$5,166		
Dust Control	1	LS	\$8,931	\$8,931		
Erosion Control and Reclamation of Areas Disturbed during Construction	1	LS	\$8,382	\$8,382		
<b>SUBTOTAL</b>				<b>\$68,938</b>		
Contingency (Scope and Bid)	30%			\$20,681		
<b>SUBTOTAL</b>				<b>\$89,619</b>		
Project Management <sup>2</sup>	10%			\$8,962		
Remedial Design <sup>2</sup>	20%			\$17,924		
Construction Management <sup>2</sup>	15%			\$13,443		
<b>TOTAL</b>				<b>\$129,948</b>		
<b>TOTAL CAPITAL COST</b>				<b>\$130,000</b>		
ANNUAL O&M COSTS (Assumed to be Incurred Annually During Year 1 through 15)						
DESCRIPTION	QTY	UNIT(S)	UNIT COST	TOTAL		
Inspection of Remedial Components	1	LS	\$2,668	\$2,668		
Surface Water Monitoring <sup>3</sup>	2	EA	\$0	\$0		
<b>SUBTOTAL</b>				<b>\$2,668</b>		
Contingency (Scope and Bid)	20%			\$534		
<b>SUBTOTAL</b>				<b>\$3,202</b>		
Project Management <sup>2</sup>	10%			\$320		
<b>TOTAL</b>				<b>\$3,522</b>		
<b>TOTAL ANNUAL O&amp;M COST</b>				<b>\$4,000</b>		
PERIODIC O&M COSTS (Assumed to be Incurred Once Every 2 Years During Year 1 through 15)						
DESCRIPTION	QTY	UNIT(S)	UNIT COST	TOTAL		
Post-Construction Maintenance	1	LS	\$8,639	\$8,639		
<b>SUBTOTAL</b>				<b>\$8,639</b>		
Contingency (Scope and Bid)	20%			\$1,728		
<b>SUBTOTAL</b>				<b>\$10,367</b>		
Project Management <sup>2</sup>	10%			\$1,037		
<b>TOTAL</b>				<b>\$11,404</b>		
<b>TOTAL PERIODIC O&amp;M COST</b>				<b>\$11,000</b>		
Summary of Present Value Analysis						
Year <sup>4</sup>	Capital Costs	Annual O&M Costs	Periodic O&M Costs	Total Annual Expenditure <sup>5</sup>	Discount Factor (7.0%)	Present Value <sup>6</sup>
0	\$130,000	\$0	\$0	\$130,000	1.0000	\$130,000
1	\$0	\$4,000	\$0	\$4,000	0.9346	\$3,738
2	\$0	\$4,000	\$11,000	\$15,000	0.8734	\$13,101
3	\$0	\$4,000	\$0	\$4,000	0.8163	\$3,265
4	\$0	\$4,000	\$11,000	\$15,000	0.7629	\$11,444
5	\$0	\$4,000	\$0	\$4,000	0.713	\$2,852
6	\$0	\$4,000	\$11,000	\$15,000	0.6663	\$9,995
7	\$0	\$4,000	\$0	\$4,000	0.6227	\$2,491
8	\$0	\$4,000	\$11,000	\$15,000	0.582	\$8,730
9	\$0	\$4,000	\$0	\$4,000	0.5439	\$2,176
10	\$0	\$4,000	\$11,000	\$15,000	0.5083	\$7,625
11	\$0	\$4,000	\$0	\$4,000	0.4751	\$1,900
12	\$0	\$4,000	\$11,000	\$15,000	0.444	\$6,660
13	\$0	\$4,000	\$0	\$4,000	0.415	\$1,660
14	\$0	\$4,000	\$11,000	\$15,000	0.3878	\$5,817
15	\$0	\$4,000	\$0	\$4,000	0.3624	\$1,450
<b>TOTALS:</b>	<b>\$130,000</b>	<b>\$60,000</b>	<b>\$77,000</b>	<b>\$267,000</b>		<b>\$212,904</b>
<b>TOTAL PRESENT VALUE OF MINE PORTAL MIW DISCHARGES IRA FOR THE SELECTED REMEDY - BROOKLYN MINE<sup>7</sup></b>						<b>\$213,000</b>
<b>Notes:</b>						
<sup>1</sup> Institutional controls could include governmental controls such as changes to The San Juan National Forest and Tres Rios Field Office Land and Resource Management Plan.						
<sup>2</sup> Percentages for contingency and professional/technical services costs are based on guidance from Section 5.0 of "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", EPA 2000. The percentages used in this table for professional/technical services may differ from the percentages presented in Table 12-1A due to the lower magnitude costs associated with Brooklyn Mine only.						
<sup>3</sup> It is assumed that surface water monitoring would be conducted at Brooklyn Mine as part of remedy performance monitoring. However, it is assumed that surface water monitoring would be conducted at a watershed level. Therefore, no cost was included in this table for surface water monitoring.						
<sup>4</sup> The period of analysis for the selected remedy is assumed to be 15 years post construction.						
<sup>5</sup> Total annual expenditure is the total cost per year with no discounting.						
<sup>6</sup> Present value cost by year is the total annual expenditure discounted by a factor for that year representing the 7.0% real discount rate recommended by "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", EPA 2000.						
<sup>7</sup> Total present value is rounded to the nearest \$1,000. Inflation and depreciation are excluded from the present value cost.						
Costs presented for this alternative are expected to have an accuracy between -30% to +50% of actual costs, based on the scope presented.						
Costs presented are expected to have an accuracy between -30% to +50% of actual costs, based on the scope presented. They are prepared solely for remedy selection and not for remedial design.						
Unit costs represent total cost divided by the estimated quantity for each item and are rounded to the nearest whole number. Due to the rounding in the unit costs, multiplying the estimated quantity by unit cost may not exactly equal the total cost.						
<b>Abbreviations:</b>						
BCY	Bank Cubic Yard					
EA	Each					
LF	Linear Foot					
LCY	Loose Cubic Yard					
LS	Lump Sum					

Table 12-2A: Cost Estimate Summary for Mining-Related Source/Stormwater Interactions IRA for the Selected Interim Remedy

CAPITAL COSTS: (Assumed to be Incurred During Year 0)				
DESCRIPTION	QTY	UNIT(S)	UNIT COST	TOTAL
Institutional Controls	1	LS	\$8,599	\$8,599
Mobilization/Demobilization	1	LS	\$25,653	\$25,653
Installation of Surface Stormwater Diversion/Isolation Components				
Nonconventional Access-Alpine Locations	1	LS	\$31,840	\$31,840
Nonconventional Access-Subalpine Locations	1	LS	\$30,599	\$30,599
Conventional Access-Subalpine Locations	1	LS	\$4,639	\$4,639
Installation of Subsurface Stormwater Diversion/Isolation Components				
Nonconventional Access-Alpine Locations	190	LF	\$43	\$8,151
Nonconventional Access-Subalpine Locations	190	LF	\$30	\$5,772
Conventional Access-Subalpine Locations	50	LF	\$29	\$1,427
Access Road Improvements	5,000	LF	\$48	\$239,369
Development of Borrow Materials	3,400	BCY	\$27	\$91,968
Transportation of Borrow Materials	3,770	LCY	\$31	\$115,376
Dust Control	1	LS	\$48,390	\$48,390
Erosion Control and Reclamation of Areas Disturbed during Construction	1	LS	\$12,521	\$12,521
SUBTOTAL				\$624,304
Contingency (Scope and Bid)	30%			\$187,291
SUBTOTAL				\$811,595
Project Management	6%			\$48,696
Remedial Design	12%			\$97,391
Construction Management	8%			\$64,928
TOTAL				\$1,022,610
TOTAL CAPITAL COST				\$1,023,000

ANNUAL O&M COSTS (Assumed to be Incurred Annually During Year 1 through 15)				
DESCRIPTION	QTY	UNIT(S)	UNIT COST	TOTAL
Inspection of Remedial Components	1	LS	\$6,567	\$6,567
Surface Water Monitoring	2	EA	\$26,937	\$53,874
SUBTOTAL				\$60,441
Contingency (Scope and Bid)	20%			\$12,088
SUBTOTAL				\$72,529
Project Management	10%			\$7,253
TOTAL				\$79,782
TOTAL ANNUAL O&M COST				\$80,000

PERIODIC O&M COSTS (Assumed to be Incurred Once Every 2 Years During Year 1 through 15)				
DESCRIPTION	QTY	UNIT(S)	UNIT COST	TOTAL
Post-Construction Maintenance	1	LS	\$15,273	\$15,273
SUBTOTAL				\$15,273
Contingency (Scope and Bid)	20%			\$3,055
SUBTOTAL				\$18,328
Project Management	10%			\$1,833
TOTAL				\$20,161
TOTAL PERIODIC O&M COST				\$20,000

Summary of Present Value Analysis						
Year <sup>1</sup>	Capital Costs	Annual O&M Costs	Periodic O&M Costs	Total Annual Expenditure <sup>2</sup>	Discount Factor (7.0%)	Present Value <sup>3</sup>
0	\$1,023,000	\$0	\$0	\$1,023,000	1.0000	\$1,023,000
1	\$0	\$80,000	\$0	\$80,000	0.9346	\$74,768
2	\$0	\$80,000	\$20,000	\$100,000	0.8734	\$87,340
3	\$0	\$80,000	\$0	\$80,000	0.8163	\$65,304
4	\$0	\$80,000	\$20,000	\$100,000	0.7629	\$76,290
5	\$0	\$80,000	\$0	\$80,000	0.713	\$57,040
6	\$0	\$80,000	\$20,000	\$100,000	0.6663	\$66,630
7	\$0	\$80,000	\$0	\$80,000	0.6227	\$49,816
8	\$0	\$80,000	\$20,000	\$100,000	0.582	\$58,200
9	\$0	\$80,000	\$0	\$80,000	0.5439	\$43,512
10	\$0	\$80,000	\$20,000	\$100,000	0.5083	\$50,830
11	\$0	\$80,000	\$0	\$80,000	0.4751	\$38,008
12	\$0	\$80,000	\$20,000	\$100,000	0.444	\$44,400
13	\$0	\$80,000	\$0	\$80,000	0.415	\$33,200
14	\$0	\$80,000	\$20,000	\$100,000	0.3878	\$38,780
15	\$0	\$80,000	\$0	\$80,000	0.3624	\$28,992
TOTALS:	\$1,023,000	\$1,200,000	\$140,000	\$2,363,000		\$1,836,110
TOTAL PRESENT VALUE OF SELECTED REMEDY <sup>4</sup>						\$1,836,000

Notes:

<sup>1</sup> The period of analysis for the selected remedy is assumed to be 15 years post construction.

<sup>2</sup> Total annual expenditure is the total cost per year with no discounting.

<sup>3</sup> Present value cost by year is the total annual expenditure discounted by a factor for that year representing the 7.0% real discount rate recommended by "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", EPA 2000.

<sup>4</sup> Total present value is rounded to the nearest \$1,000. Inflation and depreciation are excluded from the present value cost.

Costs presented for this alternative are expected to have an accuracy between -30% to +50% of actual costs, based on the scope presented.

Percentages used for contingency and professional/technical services costs are based on guidance from Section 5.0 of "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", EPA 2000.

Costs presented are expected to have an accuracy between -30% to +50% of actual costs, based on the scope presented. They are prepared solely for remedy selection and not for remedial design.

Unit costs represent total cost divided by the estimated quantity for each item and are rounded to the nearest whole number. Due to the rounding in the unit costs, multiplying the estimated quantity by unit cost may not exactly equal the total cost.

Abbreviations:	
BCY	Bank Cubic Yard
EA	Each
LF	Linear Feet
LCY	Loose Cubic Yard
LS	Lump Sum



Table 12-2B: Cost Estimate Summary for Mining-Related Source/Stormwater Interactions IRA for the Selected Interim Remedy – Brooklyn Mine

CAPITAL COSTS: (Assumed to be Incurred During Year 0)				
DESCRIPTION	QTY	UNIT(S)	UNIT COST	TOTAL
Institutional Controls <sup>1</sup>	1	LS	\$1,075	\$1,075
Mobilization/Demobilization	1	LS	\$6,860	\$6,860
Installation of Surface Stormwater Diversion/Isolation Components	1	LS	\$6,279	\$6,279
Installation of Subsurface Stormwater Diversion/Isolation Components	40	LF	\$33	\$1,321
Access Road Improvements	1	LS	\$6,250	\$6,250
Development of Borrow Materials	120	BCY	\$57	\$6,889
Transportation of Borrow Materials	120	LCY	\$26	\$3,099
Dust Control	1	LS	\$325	\$325
Erosion Control and Reclamation of Areas Disturbed during Construction	1	LS	\$1,642	\$1,642
SUBTOTAL				\$33,740
Contingency (Scope and Bid)	30%			\$10,122
SUBTOTAL				\$43,862
Project Management <sup>2</sup>	10%			\$4,386
Remedial Design <sup>2</sup>	20%			\$8,772
Construction Management <sup>2</sup>	15%			\$6,579
TOTAL				\$63,599
TOTAL CAPITAL COST				\$64,000

ANNUAL O&M COSTS (Assumed to be Incurred Annually During Year 1 through 15)				
DESCRIPTION	QTY	UNIT(S)	UNIT COST	TOTAL
Inspection of Remedial Components	1	LS	\$2,668	\$2,668
Surface Water Monitoring <sup>3</sup>	2	EA	\$0	\$0
SUBTOTAL				\$2,668
Contingency (Scope and Bid)	20%			\$534
SUBTOTAL				\$3,202
Project Management <sup>2</sup>	10%			\$320
TOTAL				\$3,522
TOTAL ANNUAL O&M COST				\$4,000

PERIODIC O&M COSTS (Assumed to be Incurred Once Every 2 Years During Year 1 through 15)				
DESCRIPTION	QTY	UNIT(S)	UNIT COST	TOTAL
Post-Construction Maintenance	1	LS	\$2,896	\$2,896
SUBTOTAL				\$2,896
Contingency (Scope and Bid)	20%			\$579
SUBTOTAL				\$3,475
Project Management <sup>2</sup>	10%			\$348
TOTAL				\$3,823
TOTAL PERIODIC O&M COST				\$4,000

Summary of Present Value Analysis						
Year <sup>4</sup>	Capital Costs	Annual O&M Costs	Periodic O&M Costs	Total Annual Expenditure <sup>5</sup>	Discount Factor (7.0%)	Present Value <sup>6</sup>
0	\$100,000	\$0	\$0	\$100,000	1.0000	\$100,000
1	\$0	\$4,000	\$0	\$4,000	0.9346	\$3,738
2	\$0	\$4,000	\$4,000	\$8,000	0.8734	\$6,987
3	\$0	\$4,000	\$0	\$4,000	0.8163	\$3,265
4	\$0	\$4,000	\$4,000	\$8,000	0.7629	\$6,103
5	\$0	\$4,000	\$0	\$4,000	0.713	\$2,852
6	\$0	\$4,000	\$4,000	\$8,000	0.6663	\$5,330
7	\$0	\$4,000	\$0	\$4,000	0.6227	\$2,491
8	\$0	\$4,000	\$4,000	\$8,000	0.582	\$4,656
9	\$0	\$4,000	\$0	\$4,000	0.5439	\$2,176
10	\$0	\$4,000	\$4,000	\$8,000	0.5083	\$4,066
11	\$0	\$4,000	\$0	\$4,000	0.4751	\$1,900
12	\$0	\$4,000	\$4,000	\$8,000	0.444	\$3,552
13	\$0	\$4,000	\$0	\$4,000	0.415	\$1,660
14	\$0	\$4,000	\$4,000	\$8,000	0.3878	\$3,102
15	\$0	\$4,000	\$0	\$4,000	0.3624	\$1,450
TOTALS:	\$100,000	\$60,000	\$28,000	\$188,000		\$153,328
TOTAL PRESENT VALUE OF MINING-RELATED SOURCE/STORMWATER INTERACTIONS IRA FOR THE SELECTED REMEDY - BROOKLYN MINE <sup>7</sup>						\$153,000

Notes:

<sup>1</sup> Institutional controls could include governmental controls such as changes to The San Juan National Forest and Tres Rios Field Office Land and Resource Management Plan.

<sup>2</sup> Percentages for contingency and professional/technical services costs are based on guidance from Section 5.0 of "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", EPA 2000. The percentages used in this table for professional/technical services may differ from the percentages presented in Table 12-2A due to the lower magnitude costs associated with Brooklyn Mine only.

<sup>3</sup> It is assumed that surface water monitoring would be conducted at Brooklyn Mine as part of remedy performance monitoring. However, it is assumed that surface water monitoring would be conducted at a watershed level. Therefore, no cost was included in this table for surface water monitoring.

<sup>4</sup> The period of analysis for the selected remedy is assumed to be 15 years post construction.

<sup>5</sup> Total annual expenditure is the total cost per year with no discounting.

<sup>6</sup> Present value cost by year is the total annual expenditure discounted by a factor for that year representing the 7.0% real discount rate recommended by "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", EPA 2000.

<sup>7</sup> Total present value is rounded to the nearest \$1,000. Inflation and depreciation are excluded from the present value cost.

Costs presented for this alternative are expected to have an accuracy between -30% to +50% of actual costs, based on the scope presented.

Costs presented are expected to have an accuracy between -30% to +50% of actual costs, based on the scope presented. They are prepared solely for remedy selection and not for remedial design.

Unit costs represent total cost divided by the estimated quantity for each item and are rounded to the nearest whole number. Due to the rounding in the unit costs, multiplying the estimated quantity by unit cost may not exactly equal the total cost.

Abbreviations:	
BCY	Bank Cubic Yard
EA	Each
LF	Linear Feet
LCY	Loose Cubic Yard
LS	Lump Sum

Table 12-3A: Cost Estimate Summary for Mine Portal Pond Sediments IRA for the Selected Interim Remedy

CAPITAL COSTS: (Assumed to be Incurred During Year 0)				
DESCRIPTION	QTY	UNIT(S)	UNIT COST	TOTAL
Institutional Controls	1	LS	\$8,599	\$8,599
Mobilization/Demobilization	1	LS	\$19,619	\$19,619
Pond Draining and Repair of Pond Berms	514,600	GAL	\$0.06	\$32,885
Mine Portal Pond Sediment Excavation	10,192	BCY	\$4	\$43,070
Geotechnical Characterization - Sampling Dewatered Mine Portal Pond Sediment	49	EA	\$403	\$19,751
Management and Dewatering of Mine Portal Pond Sediment at Interim Local Waste Management Areas	12,240	LCY	\$22	\$265,683
Access Road Improvements	4,800	LF	\$47	\$224,184
Development of Borrow Materials	2,710	BCY	\$28	\$75,195
Transportation of Borrow Materials	3,070	LCY	\$26	\$79,621
Dust Control	1	LS	\$47,091	\$47,091
Erosion Control and Reclamation of Areas Disturbed during Construction	1	LS	\$11,225	\$11,225
SUBTOTAL				\$826,923
Contingency (Scope and Bid)	30%			\$248,077
SUBTOTAL				\$1,075,000
Project Management	6%			\$64,500
Remedial Design	12%			\$129,000
Construction Management	8%			\$86,000
TOTAL				\$1,354,500
TOTAL CAPITAL COST				\$1,355,000

ANNUAL O&M COSTS (Assumed to be Incurred Annually During Year 1 through 15)				
DESCRIPTION	QTY	UNIT(S)	UNIT COST	TOTAL
Inspection of Remedial Components	1	LS	\$4,926	\$4,926
Surface Water Monitoring	2	EA	\$25,453	\$50,906
SUBTOTAL				\$55,832
Contingency (Scope and Bid)	20%			\$11,166
SUBTOTAL				\$66,998
Project Management	10%			\$6,700
TOTAL				\$73,698
TOTAL ANNUAL O&M COST				\$74,000

PERIODIC O&M COSTS - INTERIM LOCAL MANAGEMENT AREA (Assumed to be Incurred Once Every 2 Years During Year 1 through 15)				
DESCRIPTION	QTY	UNIT(S)	UNIT COST	TOTAL
Post-Construction Maintenance of Interim Local Management Areas	1	LS	\$8,015	\$8,015
SUBTOTAL				\$8,015
Contingency (Scope and Bid)	20%			\$1,603
SUBTOTAL				\$9,618
Project Management	10%			\$962
TOTAL				\$10,580
TOTAL PERIODIC O&M COST				\$11,000

PERIODIC O&M COSTS - POND CLEANOUT (Assumed to be Incurred Once Every 3 Years During Year 1 through 15)				
DESCRIPTION	QTY	UNIT(S)	UNIT COST	TOTAL
Periodic Removal of Mine Portal Pond Sediment	1	LS	\$267,360	\$267,360
SUBTOTAL				\$267,360
Contingency (Scope and Bid)	30%			\$80,208
SUBTOTAL				\$347,568
Project Management	8%			\$27,805
Remedial Design	15%			\$52,135
Construction Management	10%			\$34,757
TOTAL				\$462,265
TOTAL PERIODIC O&M COST				\$462,000

Summary of Present Value Analysis						
Year <sup>1</sup>	Capital Costs	Annual O&M Costs	Periodic O&M Costs	Total Annual Expenditure <sup>2</sup>	Discount Factor (7.0%)	Present Value <sup>3</sup>
0	\$1,355,000	\$0	\$0	\$1,355,000	1.0000	\$1,355,000
1	\$0	\$74,000	\$0	\$74,000	0.9346	\$69,160
2	\$0	\$74,000	\$11,000	\$85,000	0.8734	\$74,239
3	\$0	\$74,000	\$462,000	\$536,000	0.8163	\$437,537
4	\$0	\$74,000	\$11,000	\$85,000	0.7629	\$64,847
5	\$0	\$74,000	\$0	\$74,000	0.713	\$52,762
6	\$0	\$74,000	\$473,000	\$547,000	0.6663	\$364,466
7	\$0	\$74,000	\$0	\$74,000	0.6227	\$46,080
8	\$0	\$74,000	\$11,000	\$85,000	0.582	\$49,470
9	\$0	\$74,000	\$462,000	\$536,000	0.5439	\$291,530
10	\$0	\$74,000	\$11,000	\$85,000	0.5083	\$43,206
11	\$0	\$74,000	\$0	\$74,000	0.4751	\$35,157
12	\$0	\$74,000	\$473,000	\$547,000	0.444	\$242,868
13	\$0	\$74,000	\$0	\$74,000	0.415	\$30,710
14	\$0	\$74,000	\$11,000	\$85,000	0.3878	\$32,963
15	\$0	\$74,000	\$462,000	\$536,000	0.3624	\$194,246
TOTALS:	\$1,355,000	\$1,110,000	\$2,387,000	\$4,852,000		\$3,384,241
TOTAL PRESENT VALUE OF SELECTED REMEDY <sup>4</sup>						\$3,384,000

Notes:  

<sup>1</sup> The period of analysis for the selected remedy is assumed to be 15 years post construction.

<sup>2</sup> Total annual expenditure is the total cost per year with no discounting.

<sup>3</sup> Present value cost by year is the total annual expenditure discounted by a factor for that year representing the 7.0% real discount rate recommended by "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", EPA 2000.

<sup>4</sup> Total present value is rounded to the nearest \$1,000. Inflation and depreciation are excluded from the present value cost.

Costs presented for this alternative are expected to have an accuracy between -30% to +50% of actual costs, based on the scope presented.

Percentages used for contingency and professional/technical services costs are based on guidance from Section 5.0 of "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", EPA 2000.

Costs presented are expected to have an accuracy between -30% to +50% of actual costs, based on the scope presented. They are prepared solely for remedy selection and not for remedial design.

Unit costs represent total cost divided by the estimated quantity for each item and are rounded to the nearest whole number. Due to the rounding in the unit costs, multiplying the estimated quantity by unit cost may not exactly equal the total cost.

Abbreviations:

BCY

Bank Cubic Yard

EA

Each

GAL

Gallons

LF

Linear Feet

LCY

Loose Cubic Yard

LS

Lump Sum

Table 12-3B: Cost Estimate Summary for Mine Portal Pond Sediments IRA for the Selected Interim Remedy – Brooklyn Mine

CAPITAL COSTS: (Assumed to be Incurred During Year 0)						
DESCRIPTION	QTY	UNIT(S)	UNIT COST	TOTAL		
Institutional Controls <sup>1</sup>	1	LS	\$1,075	\$1,075		
Mobilization/Demobilization	1	LS	\$2,906	\$2,906		
Pond Draining and Repair of Pond Berms	184,000	GAL	\$0.06	\$11,094		
Mine Portal Pond Sediment Excavation	3,644	BCY	\$4	\$15,958		
Geotechnical Characterization - Sampling Dewatered Mine Portal Pond Sediment	18	EA	\$394	\$7,088		
Management and Dewatering of Mine Portal Pond Sediment at Interim Local Waste Management Areas	4,380	LCY	\$25	\$108,252		
Access Road Improvements	1	LS	\$6,250	\$6,250		
Development of Borrow Materials	140	BCY	\$42	\$5,858		
Transportation of Borrow Materials	170	LCY	\$26	\$4,391		
Dust Control	1	LS	\$325	\$325		
Erosion Control and Reclamation of Areas Disturbed during Construction	1	LS	\$1,642	\$1,642		
SUBTOTAL				\$164,839		
Contingency (Scope and Bid)	30%			\$49,452		
SUBTOTAL				\$214,291		
Project Management <sup>2</sup>	8%			\$17,143		
Remedial Design <sup>2</sup>	15%			\$32,144		
Construction Management <sup>2</sup>	10%			\$21,429		
TOTAL				\$285,007		
TOTAL CAPITAL COST				\$285,000		
ANNUAL O&M COSTS (Assumed to be Incurred Annually During Year 1 through 15)						
DESCRIPTION	QTY	UNIT(S)	UNIT COST	TOTAL		
Inspection of Remedial Components	1	LS	\$2,668	\$2,668		
Surface Water Monitoring <sup>3</sup>	1	LS	\$0	\$0		
SUBTOTAL				\$2,668		
Contingency (Scope and Bid)	20%			\$534		
SUBTOTAL				\$3,202		
Project Management <sup>2</sup>	10%			\$320		
TOTAL				\$3,522		
TOTAL ANNUAL O&M COST				\$4,000		
PERIODIC O&M COSTS - INTERIM LOCAL MANAGEMENT AREA (Assumed to be Incurred Once Every 2 Years During Year 1 through 15)						
DESCRIPTION	QTY	UNIT(S)	UNIT COST	TOTAL		
Post-Construction Maintenance of Interim Local Management Areas	1	LS	\$3,505	\$3,505		
SUBTOTAL				\$3,505		
Project Management <sup>2</sup>	20%			\$701		
SUBTOTAL				\$4,206		
Project Management	10%			\$421		
TOTAL				\$4,627		
TOTAL PERIODIC O&M COST				\$5,000		
Summary of Present Value Analysis						
Year <sup>4</sup>	Capital Costs	Annual O&M Costs	Periodic O&M Costs	Total Annual Expenditure <sup>5</sup>	Discount Factor (7.0%)	Present Value <sup>6</sup>
0	\$325,000	\$0	\$0	\$325,000	1.0000	\$325,000
1	\$0	\$4,000	\$0	\$4,000	0.9346	\$3,738
2	\$0	\$4,000	\$5,000	\$9,000	0.8734	\$7,861
3	\$0	\$4,000	\$0	\$4,000	0.8163	\$3,265
4	\$0	\$4,000	\$5,000	\$9,000	0.7629	\$6,866
5	\$0	\$4,000	\$0	\$4,000	0.713	\$2,852
6	\$0	\$4,000	\$5,000	\$9,000	0.6663	\$5,997
7	\$0	\$4,000	\$0	\$4,000	0.6227	\$2,491
8	\$0	\$4,000	\$5,000	\$9,000	0.582	\$5,238
9	\$0	\$4,000	\$0	\$4,000	0.5439	\$2,176
10	\$0	\$4,000	\$5,000	\$9,000	0.5083	\$4,575
11	\$0	\$4,000	\$0	\$4,000	0.4751	\$1,900
12	\$0	\$4,000	\$5,000	\$9,000	0.444	\$3,996
13	\$0	\$4,000	\$0	\$4,000	0.415	\$1,660
14	\$0	\$4,000	\$5,000	\$9,000	0.3878	\$3,490
15	\$0	\$4,000	\$0	\$4,000	0.3624	\$1,450
TOTALS:	\$325,000	\$60,000	\$35,000	\$420,000		\$382,555
TOTAL PRESENT VALUE OF MINE PORTAL POND SEDIMENTS IRA FOR THE SELECTED REMEDY - BROOKLYN MINE <sup>7</sup>						\$383,000
Notes:						
<sup>1</sup> Institutional controls could include governmental controls such as changes to The San Juan National Forest and Tres Rios Field Office Land and Resource Management Plan.						
<sup>2</sup> Percentages for contingency and professional/technical services costs are based on guidance from Section 5.0 of "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", EPA 2000. The percentages used in this table for professional/technical services may differ from the percentages presented in Table 12-3A due to the lower magnitude costs associated with Brooklyn Mine only.						
<sup>3</sup> It is assumed that surface water monitoring would be conducted at Brooklyn Mine as part of remedy performance monitoring. However, it is assumed that surface water monitoring would be conducted at a watershed level. Therefore, no cost was included in this table for surface water monitoring.						
<sup>4</sup> The period of analysis for the selected remedy is assumed to be 15 years post construction.						
<sup>5</sup> Total annual expenditure is the total cost per year with no discounting.						
<sup>6</sup> Present value cost by year is the total annual expenditure discounted by a factor for that year representing the 7.0% real discount rate recommended by "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", EPA 2000.						
<sup>7</sup> Total present value is rounded to the nearest \$1,000. Inflation and depreciation are excluded from the present value cost.						
Costs presented for this alternative are expected to have an accuracy between -30% to +50% of actual costs, based on the scope presented.						
Costs presented are expected to have an accuracy between -30% to +50% of actual costs, based on the scope presented. They are prepared solely for remedy selection and not for remedial design.						
Unit costs represent total cost divided by the estimated quantity for each item and are rounded to the nearest whole number. Due to the rounding in the unit costs, multiplying the estimated quantity by unit cost may not exactly equal the total cost.						
Abbreviations:						
BCY	Bank Cubic Yard					
EA	Each					
GAL	Gallons					
LF	Linear Feet					
LCY	Loose Cubic Yard					
LS	Lump Sum					

Table 12-4: Cost Estimate Summary for In-Stream Mine Wastes IRA for the Selected Interim Remedy

CAPITAL COSTS: (Assumed to be Incurred During Year 0)						
DESCRIPTION	QTY	UNIT(S)	UNIT COST	TOTAL		
Institutional Controls	1	LS	\$8,599	\$8,599		
Mobilization/Demobilization	1	LS	\$8,802	\$8,802		
In-Stream Mine Waste Excavation	467	BCY	\$4	\$2,045		
Geotechnical Characterization - Sampling Dewatered In-Stream Mine Waste	3	EA	\$394	\$1,182		
Management and Dewatering of In-Stream Mine Waste at Interim Local Waste Management Areas	570	LCY	\$26	\$14,579		
Access Road Improvements	100	LF	\$515	\$51,481		
Development of Borrow Materials	90	BCY	\$57	\$5,165		
Transportation of Borrow Materials	170	LCY	\$57	\$9,624		
Dust Control	1	LS	\$42,220	\$42,220		
Erosion Control and Reclamation of Areas Disturbed during Construction	1	LS	\$9,107	\$9,107		
<b>SUBTOTAL</b>						\$152,804
Contingency (Scope and Bid)	30%					\$45,841
<b>SUBTOTAL</b>						\$198,645
Project Management	8%					\$15,892
Remedial Design	15%					\$29,797
Construction Management	10%					\$19,865
<b>TOTAL</b>						\$264,199
<b>TOTAL CAPITAL COST</b>						<b>\$264,000</b>
ANNUAL O&M COSTS (Assumed to be Incurred Annually During Year 1 through 15)						
DESCRIPTION	QTY	UNIT(S)	UNIT COST	TOTAL		
Inspection of Remedial Components	1	LS	\$2,668	\$2,668		
Surface Water Monitoring	2	EA	\$7,312	\$14,623		
<b>SUBTOTAL</b>					SUBTOTAL	\$17,291
Contingency (Scope and Bid)	20%					\$3,458
<b>SUBTOTAL</b>					SUBTOTAL	\$20,749
Project Management	10%					\$2,075
<b>TOTAL</b>					TOTAL	\$22,824
<b>TOTAL ANNUAL O&amp;M COST</b>						<b>\$23,000</b>
PERIODIC O&M COSTS (Assumed to be Incurred Once Every 2 Years During Year 1 through 15)						
DESCRIPTION	QTY	UNIT(S)	UNIT COST	TOTAL		
Post-Construction Maintenance	1	LS	\$7,010	\$7,010		
<b>SUBTOTAL</b>					SUBTOTAL	\$7,010
Contingency (Scope and Bid)	20%					\$1,402
<b>SUBTOTAL</b>					SUBTOTAL	\$8,412
Project Management	10%					\$841
<b>TOTAL</b>					TOTAL	\$9,253
<b>TOTAL PERIODIC O&amp;M COST</b>						<b>\$9,000</b>
Summary of Present Value Analysis						
Year <sup>1</sup>	Capital Costs	Annual O&M Costs	Periodic O&M Costs	Total Annual Expenditure <sup>2</sup>	Discount Factor (7.0%)	Present Value <sup>3</sup>
0	\$264,000	\$0	\$0	\$264,000	1.0000	\$264,000
1	\$0	\$23,000	\$0	\$23,000	0.9346	\$21,496
2	\$0	\$23,000	\$9,000	\$32,000	0.8734	\$27,949
3	\$0	\$23,000	\$0	\$23,000	0.8163	\$18,775
4	\$0	\$23,000	\$9,000	\$32,000	0.7629	\$24,413
5	\$0	\$23,000	\$0	\$23,000	0.713	\$16,399
6	\$0	\$23,000	\$9,000	\$32,000	0.6663	\$21,322
7	\$0	\$23,000	\$0	\$23,000	0.6227	\$14,322
8	\$0	\$23,000	\$9,000	\$32,000	0.582	\$18,624
9	\$0	\$23,000	\$0	\$23,000	0.5439	\$12,510
10	\$0	\$23,000	\$9,000	\$32,000	0.5083	\$16,266
11	\$0	\$23,000	\$0	\$23,000	0.4751	\$10,927
12	\$0	\$23,000	\$9,000	\$32,000	0.444	\$14,208
13	\$0	\$23,000	\$0	\$23,000	0.415	\$9,545
14	\$0	\$23,000	\$9,000	\$32,000	0.3878	\$12,410
15	\$0	\$23,000	\$0	\$23,000	0.3624	\$8,335
<b>TOTALS:</b>	<b>\$264,000</b>	<b>\$345,000</b>	<b>\$63,000</b>	<b>\$672,000</b>		<b>\$511,501</b>
<b>TOTAL PRESENT VALUE OF SELECTED REMEDY<sup>4</sup></b>						<b>\$512,000</b>
<b>Notes:</b>						
<sup>1</sup> The period of analysis for the selected remedy is assumed to be 15 years post construction.						
<sup>2</sup> Total annual expenditure is the total cost per year with no discounting.						
<sup>3</sup> Present value cost by year is the total annual expenditure discounted by a factor for that year representing the 7.0% real discount rate recommended by "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", EPA 2000.						
<sup>4</sup> Total present value is rounded to the nearest \$1,000. Inflation and depreciation are excluded from the present value cost.						
Costs presented for this alternative are expected to have an accuracy between -30% to +50% of actual costs, based on the scope presented.						
Percentages used for contingency and professional/technical services costs are based on guidance from Section 5.0 of "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", EPA 2000.						
Costs presented are expected to have an accuracy between -30% to +50% of actual costs, based on the scope presented. They are prepared solely for remedy selection and not for remedial design.						
Unit costs represent total cost divided by the estimated quantity for each item and are rounded to the nearest whole number. Due to the rounding in the unit costs, multiplying the estimated quantity by unit cost may not exactly equal the total cost.						
<b>Abbreviations:</b>						
ACR	Acre					
BCY	Bank Cubic Yard					
LCY	Loose Cubic Yard					
LF	Linear Feet					
LS	Lump Sum					

Table 12-5: Cost Estimate Summary for Mining-Impacted Recreation Staging Areas IRA for the Selected Interim Remedy

**CAPITAL COSTS: (Assumed to be Incurred During Year 0)**

DESCRIPTION	QTY	UNIT(S)	UNIT COST	TOTAL
Institutional Controls	1	LS	\$8,599	\$8,599
Mobilization/Demobilization	1	LS	\$12,562	\$12,562
Placement of Gravel Cover	2.0	ACR	\$13,494	\$26,987
Placement of Soil Cover	6.9	ACR	\$21,981	\$151,669
Access Road Improvements	1	LS	\$50,000	\$50,000
Development of Borrow Materials	18,600	BCY	\$7	\$133,493
Transportation of Borrow Materials	21,900	LCY	\$15	\$333,371
Dust Control	1	LS	\$75,670	\$75,670
Erosion Control	1	LS	\$8,210	\$8,210
<b>SUBTOTAL</b>				<b>\$800,561</b>
Contingency (Scope and Bid)	20%			<b>\$160,112</b>
<b>SUBTOTAL</b>				<b>\$960,673</b>
Project Management	6%			\$57,640
Remedial Design	12%			\$115,281
Construction Management	8%			<b>\$76,854</b>
<b>TOTAL</b>				<b>\$1,210,448</b>
<b>TOTAL CAPITAL COST</b>				<b>\$1,210,000</b>

**ANNUAL O&M COSTS (Assumed to be Incurred Annually During Year 1 through 15)**

DESCRIPTION	QTY	UNIT(S)	UNIT COST	TOTAL
Inspection of Remedial Components	1	LS	\$6,567	\$6,567
<b>SUBTOTAL</b>				<b>\$6,567</b>
Contingency (Scope and Bid)	20%			<b>\$1,313</b>
<b>SUBTOTAL</b>				<b>\$7,880</b>
Project Management	10%			<b>\$788</b>
<b>TOTAL</b>				<b>\$8,668</b>
<b>TOTAL ANNUAL O&amp;M COST</b>				<b>\$9,000</b>

**PERIODIC O&M COSTS (Assumed to be Incurred Once Every 2 Years During Year 1 through 15)**

DESCRIPTION	QTY	UNIT(S)	UNIT COST	TOTAL
Post-Construction Maintenance	1	LS	\$67,385	\$67,385
<b>SUBTOTAL</b>				<b>\$67,385</b>
Contingency (Scope and Bid)	20%			<b>\$13,477</b>
<b>SUBTOTAL</b>				<b>\$80,862</b>
Project Management	10%			<b>\$8,086</b>
<b>TOTAL</b>				<b>\$88,948</b>
<b>TOTAL PERIODIC O&amp;M COST</b>				<b>\$89,000</b>

**Summary of Present Value Analysis**

Year <sup>1</sup>	Capital Costs	Annual O&M Costs	Periodic O&M Costs	Total Annual Expenditure <sup>2</sup>	Discount Factor (7.0%)	Present Value <sup>3</sup>
0	\$1,210,000	\$0	\$0	\$1,210,000	1.0000	\$1,210,000
1	\$0	\$9,000	\$0	\$9,000	0.9346	\$8,411
2	\$0	\$9,000	\$89,000	\$98,000	0.8734	\$85,593
3	\$0	\$9,000	\$0	\$9,000	0.8163	\$7,347
4	\$0	\$9,000	\$89,000	\$98,000	0.7629	\$74,764
5	\$0	\$9,000	\$0	\$9,000	0.713	\$6,417
6	\$0	\$9,000	\$89,000	\$98,000	0.6663	\$65,297
7	\$0	\$9,000	\$0	\$9,000	0.6227	\$5,604
8	\$0	\$9,000	\$89,000	\$98,000	0.582	\$57,036
9	\$0	\$9,000	\$0	\$9,000	0.5439	\$4,895
10	\$0	\$9,000	\$89,000	\$98,000	0.5083	\$49,813
11	\$0	\$9,000	\$0	\$9,000	0.4751	\$4,276
12	\$0	\$9,000	\$89,000	\$98,000	0.444	\$43,512
13	\$0	\$9,000	\$0	\$9,000	0.415	\$3,735
14	\$0	\$9,000	\$89,000	\$98,000	0.3878	\$38,004
15	\$0	\$9,000	\$0	\$9,000	0.3624	\$3,262
<b>TOTALS:</b>	<b>\$1,210,000</b>	<b>\$135,000</b>	<b>\$623,000</b>	<b>\$1,968,000</b>		<b>\$1,667,966</b>
<b>TOTAL PRESENT VALUE OF SELECTED REMEDY<sup>4</sup></b>						<b>\$1,668,000</b>

**Notes:**<sup>1</sup> The period of analysis for the selected remedy is assumed to be 15 years post construction.<sup>2</sup> Total annual expenditure is the total cost per year with no discounting.<sup>3</sup> Present value cost by year is the total annual expenditure discounted by a factor for that year representing the 7.0% real discount rate recommended by "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", EPA 2000.<sup>4</sup> Total present value is rounded to the nearest \$1,000. Inflation and depreciation are excluded from the present value cost.

Costs presented for this alternative are expected to have an accuracy between -30% to +50% of actual costs, based on the scope presented.

Percentages used for contingency and professional/technical services costs are based on guidance from Section 5.0 of "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", EPA 2000.

Costs presented are expected to have an accuracy between -30% to +50% of actual costs, based on the scope presented. They are prepared solely for remedy selection and not for remedial design.

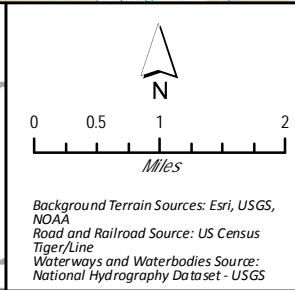
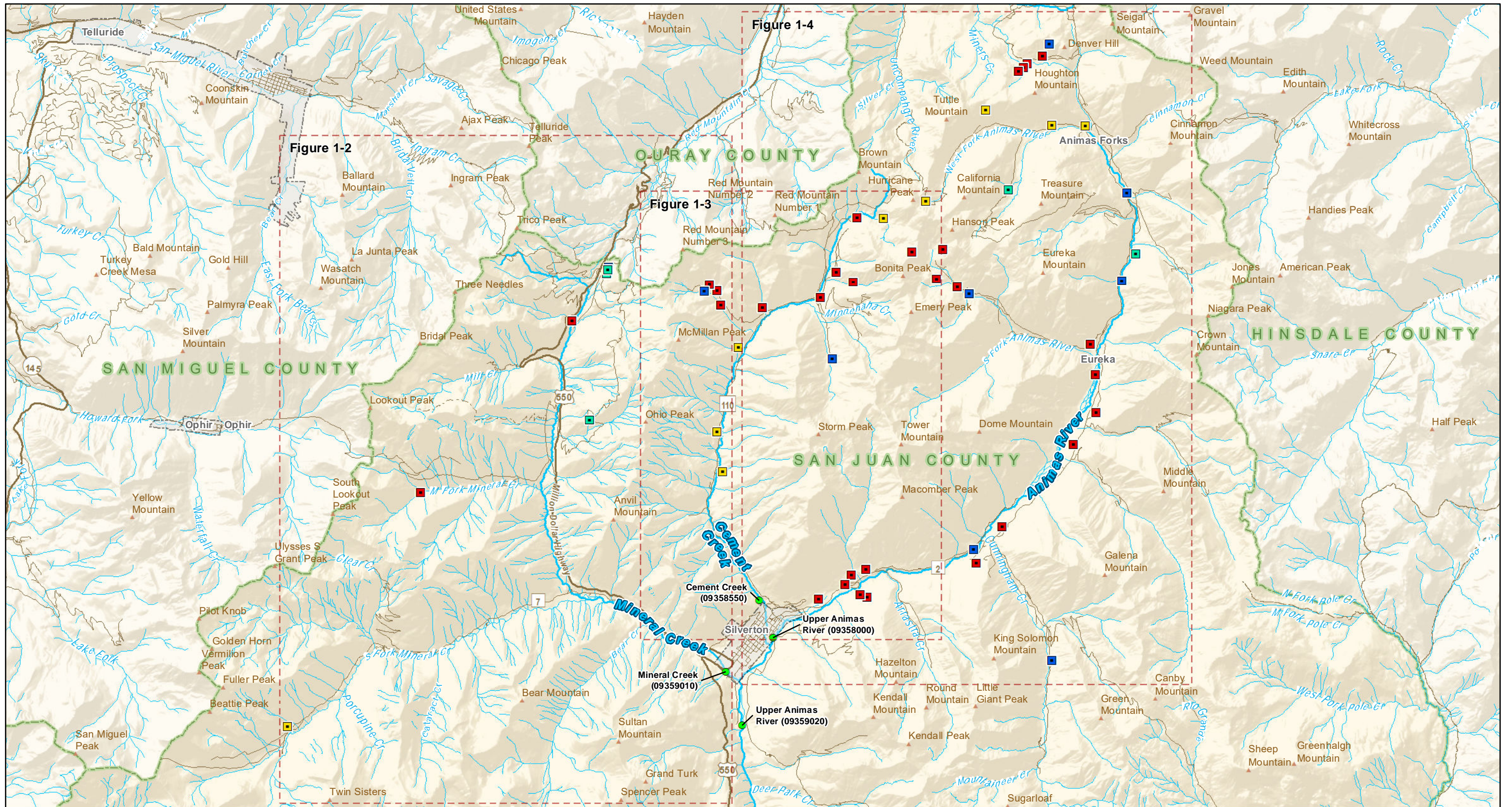
Unit costs represent total cost divided by the estimated quantity for each item and are rounded to the nearest whole number. Due to the rounding in the unit costs, multiplying the estimated quantity by unit cost may not exactly equal the total cost.

**Abbreviations:**

ACR	Acre
BCY	Bank Cubic Yard
EA	Each
LF	Linear Feet
LCY	Loose Cubic Yard
LS	Lump Sum

## FIGURES





- Legend**
- River
  - Forest Service Road
  - Road
  - US Highway
  - County Boundary
  - Mining-Related Source - Excluded from IROD
  - Mining-Related Source - 1 Interim Remedial Action
  - Mining-Related Source - 2 Interim Remedial Actions
  - Mining-Related Source - 3 Interim Remedial Actions
  - USGS Gaging Station

**Figure 1-1**  
**Site Vicinity Map**  
 Bonita Peak Mining District Superfund Site | San Juan County, CO



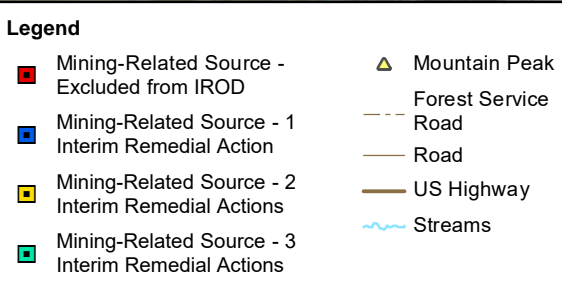
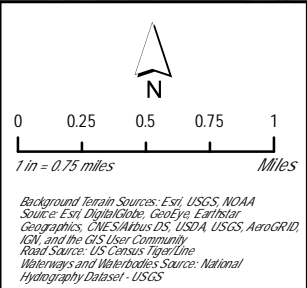
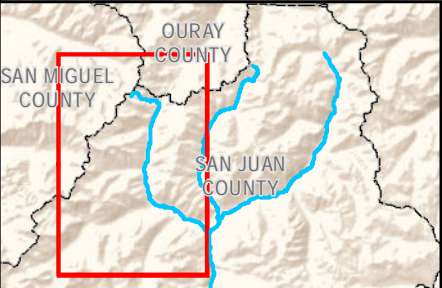


Figure 1-2  
Mining-Related Sources -  
Mineral Creek Drainage Basin

Bonita Peak Mining District Superfund Site | San Juan County, CO



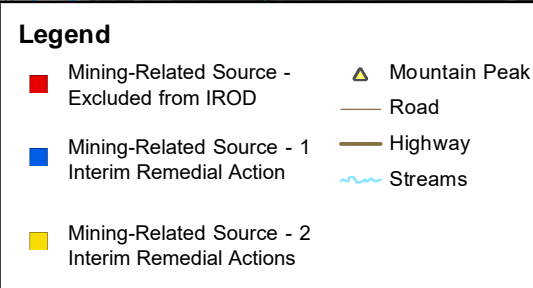
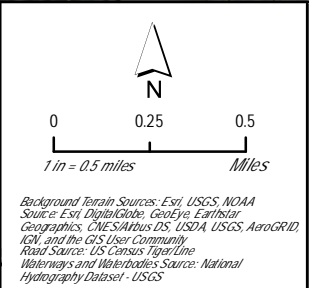
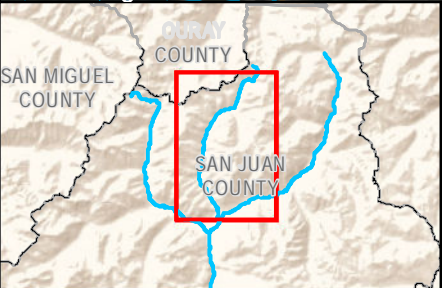
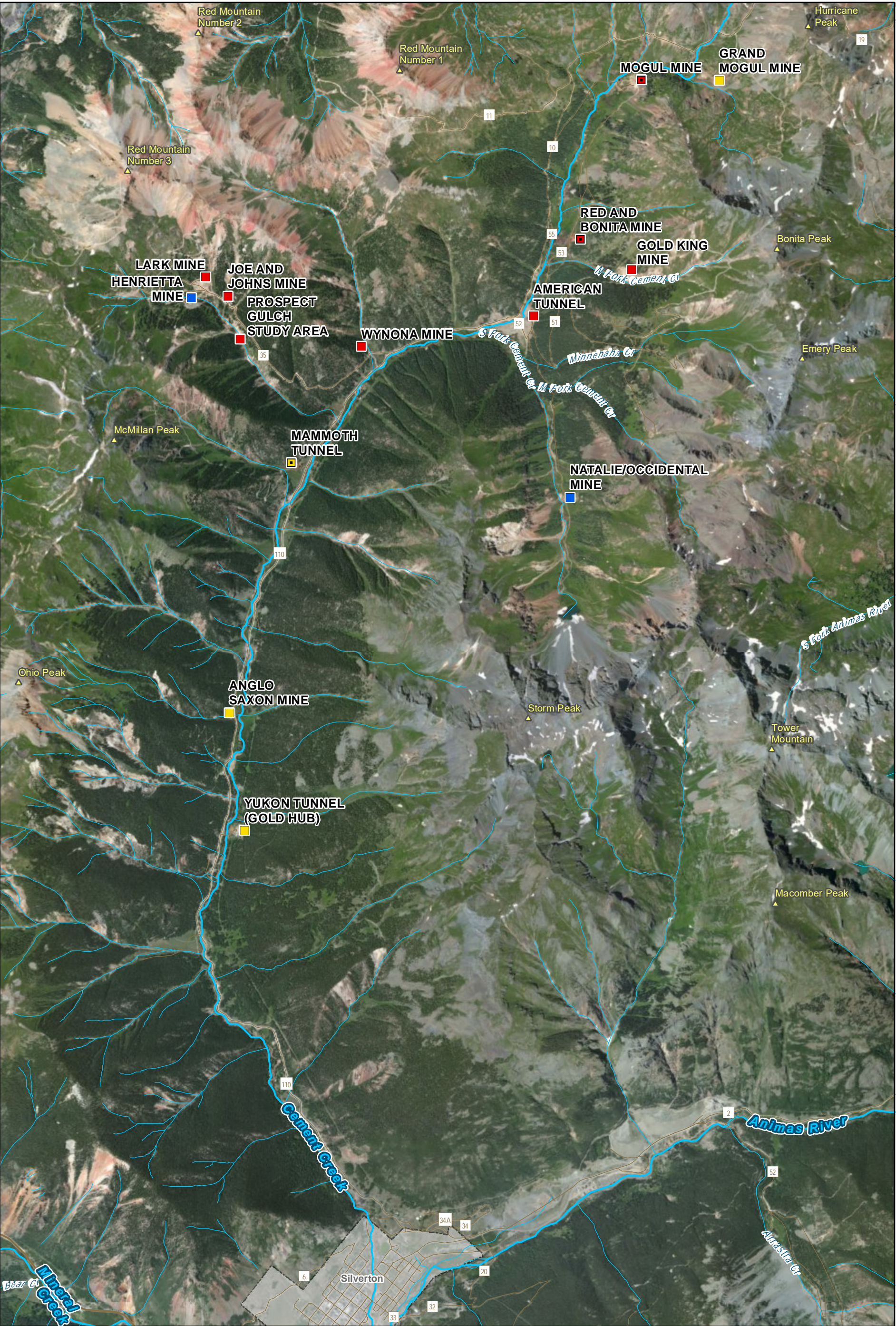


Figure 1-3  
Mining-Related Sources -  
Cement Creek Drainage Basin



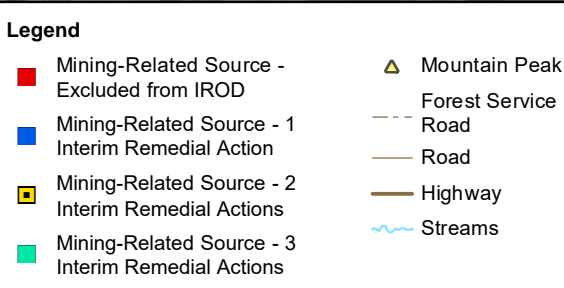
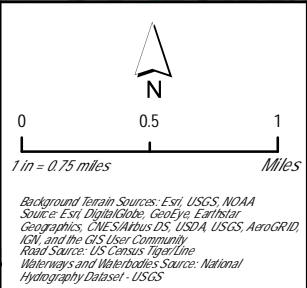
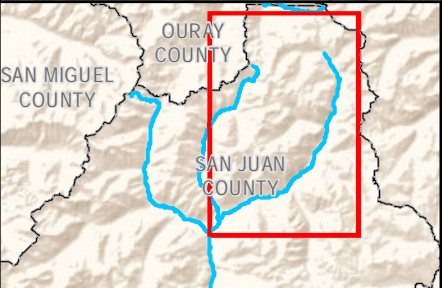


Figure 1-4  
Mining-Related Sources -  
Upper Animas Area Drainage Basin

Bonita Peak Mining District Superfund Site | San Juan County, CO



**APPENDIX A**  
**PRELIMINARY REMEDIAL INVESTIGATION REPORT**

**APPENDIX A – PART 1**  
**RESPONSE TO PUBLIC COMMENTS**  
**PRELIMINARY REMEDIAL INVESTIGATION REPORT FOR THE**  
**BONITA PEAK MINING DISTRICT**



## Memorandum

*To: Rob Parker, Remedial Project Manager, U.S. Environmental Protection Agency Region 8*

*From: Tommy Cook and Neil Smith, CDM Federal Programs Corporation*

*Date: 10/19/2018*

*Subject: Response to Public Comments – Preliminary Remedial Investigation Report for the Bonita Peak Mining District*

This memorandum was drafted to summarize updates to the preliminary remedial investigation (RI) report submitted as Appendix A to the focused feasibility study in May 2018 (CDM Federal Programs Corporation 2018) as part of the interim remedial action proposed to take place within the Bonita Peak Mining District Superfund Site (the Site) in San Juan County, Colorado. These updates are in response to public comments on the documents received between June 14 and August 15, 2018, which necessitate a change to the main text and tables of the preliminary RI report.

Section 4.8.2.1 of the text and Table 4-1 present a flow measurement of 0.7 gallons per minute (gpm) at sampling location DM6 at the London Mine. This measurement was conducted by the Colorado Division of Reclamation, Mining, and Safety (DRMS) on September 16, 2016, 2 weeks before the September 30, 2016 analytical sample was collected at this location. During sampling on September 30, 2016, there was no flow reported at location DM6 (TechLaw, Inc. 2017). The reported flow value from DRMS of 0.7 gpm was collected at location DM7, rather than DM6. Table 4-1 has been modified to indicate the flow of 0.7 gpm was measured at location DM7, and a column has been added indicating dates flow measurements were collected by DRMS if different than the date the analytical sample for surface water was collected by the U.S. Environmental Protection Agency/Environmental Services Assistances Team. The revised Table 4-1 is presented as Attachment A to this memorandum.

## References

CDM Federal Programs Corporation. 2018. *Final Focused Feasibility Study Report. Interim Remedial Actions. Bonita Peak Mining District Superfund Site*. San Juan County, Colorado. Prepared for the U.S. Environmental Protection Agency, Region 8.

TechLaw, Inc. 2017. *Draft Sampling Activities Report, 2016 Sampling Activities Report, Bonita Peak Mining District, San Juan/La Plata Counties, Colorado*. Prepared for U.S. Environmental Protection Agency, Region 8.

Mr. Rob Parker  
October 19, 2018  
Page 2

**Attachment:**

Attachment A Revised Table 4-1, Preliminary Remedial Investigation Report.

Table 4-1  
Total and Dissolved Metals for 2015 and 2016 EPA/ESAT Surface Water Samples  
Bonita Peak Mining District, San Juan County, Colorado  
Preliminary Remedial Investigation Report

						Metal Concentrations (µg/L)																															
						Aluminum				Arsenic				Cadmium				Copper				Iron				Manganese				Lead				Zinc			
						T		D		T		D		T		D		T		D		T		D		T		D		T		D		T		D	
Mine Location	Station Name	Analytical Sample Date	pH	Flow Measurement Date*	Flow (gpm)	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q		
Longfellow Mine	M02D	6/29/2016	6.61		15	286		33.4	J	3.85	J	2.64		0.5	U	0.1	U	8.91		7.2		650		179	J	80		51.9		1.45		0.213		10	U	10	U
	M02D	10/7/2016	6.83		4.9	183		22.4	J	2.5	U	1.67	J	0.5	U	0.1	U	5.04		4.14		577		146	J	88.1		64.7		0.931	J	0.185	J	10	U	10	U
Junction Mine	M02B	6/29/2016	6.15		12	1720		227		143		57.2		7.17		7.46		261		182		16600		13500		348		365		131		5.26		1640		1770	
	M02B	10/7/2016	3.86		2.9	7110		6320		303		213		25.1		26.1		777		794		64000		56100		1780		1740		304		300		6590		6510	
Koehler Tunnel	M02K1	6/29/2016	4.54		0.1	3870		3720		2.5	U	2.5	U	40.7		40.5		3170		3310		324		309		16600		16400		3.19		3.29		17700		18100	
	M02C	10/7/2016	6.12		4.5	12900		1950		3000		1020		86.2		89.4		3140		2100		177000		152000		37600		37300		152		1.51		41500		41400	
	M02E	6/29/2016	--		--	3500		2460		177		30.4		19.4		21.1		891		863		17600		13000		7220		7020		100		36.6		7870		7930	
	M02E	10/7/2016	3.60		9.0	8100		7590		234		67.4		47.2		42.8		1610		1410		40400		33800		20800		17200		59.8		73.4		22400		18700	
	M02	6/29/2016	5.76		150	2590		422		119		15.1		12.2		12.5		522		449		10000		6710		4120		4050		75.3		8.87		4590		4690	
	M02	10/7/2016	8.03		23	6770		6190		90.3		30.3		35.7		36.4		1290		1320		17100		15200		16200		15600		35.5		35.1		16800		16400	
Brooklyn Mine	M12	6/7/2016	4.55		--	3460		290		7.59	J	0.5	U	0.726	J	0.719		15.6		6.08		7400		136	J	488		301		14.6		0.198	J	174		156	
	M12	6/29/2016	5.08		438	3370		3030		2.5	U	0.5	U	3.94		4.02		33.9		34.4		911		410		1320		1300		3.3		2.52		861		887	
	M12	9/29/2016	4.17		165	9130		8700		2.5	U	0.5	U	6.07		6.2		53.4		54.4		1210		1040		2280		2280		3.88		4.02		1300		1370	
	M12A	6/29/2016	4.51		--	3850		3120		2.5	U	0.5	U	1.05		1.11		22.9		22.3		1590		362		799		763		7.04		1.44		282		276	
	M12A	9/30/2016	4.45		151	10200		9630		2.5	U	0.5	U	1.28		1.49		31.7		32.2		1200		627		1440		1440		1.66		1.55		347		363	
	M12B	6/29/2016	4.76		223	3940		3510		2.5	U	0.5	U	0.5	U	0.266		11.1		11.2		966		419		545		535		1.11		0.65		61		54.6	
	M12B	9/30/2016	4.55		151	11900		11000		2.5	U	0.5	U	0.5	U	0.307		19.6		20.1		1770		1050		1190		1190		0.81	J	0.631		81		81.5	
	M12C	6/29/2016	3.63		7.3	1890		1010		20.7		0.5	U	14.9		15.6		236		177		26400		4070		5240		5100		25.1		1.69		4670		4600	
	M12C	9/29/2016	3.84		1.1	3620		2920		39.3		1.63	J	19.1		18.7		348		300		58800		16300		6440		6430		116		20.7		5780		6060	
	M12C	9/30/2016	3.84		1.1	3020		2450		20.6		2.7		19		18.8		319		302		33700		16600		6380		6390		25		18.2		5690		5950	
	M12D	9/30/2016	3.72		2.2	2770		2170		20.1		1.4	J	18.9		19		328		317		27600		10400		6300		6300		24.7		19.5		5810		6100	
	M12F	10/7/2016	7.79		--	83.1		48.1	J	2.5	U	0.908	J	0.5	U	0.1	U	2.5	U	0.945	J	105	J	100	U	193		4.09	J	0.5	U	0.1	U	10	U	10	U
	M12G	10/7/2016	4.07		--	642		576		2.5	U	0.5	U	0.5	U	0.433		22.1		23.8		591		502		938		915		126		125		117		121	
Bandora Mine	M23	9/27/2016	5.98		7351	2070		554		2.5	U	0.5	U	0.5	U	0.349		2.5	U	1.33		162	J	100	U	200		200		0.5	U	0.246		32.5		40	
	M24A	9/28/2016	6.96		--	957		36	J	12.8		0.5	U	67.8		35.8		1070		3.15		74900		195	J	6770		4870		977		0.147	J	13500		8750	
	M24B	9/28/2016	6.71	9/29/2016	24	210		37.8	J	2.5	U	0.507	J	49.3		48		233		19.3		16100		5300		5290		4940		201		3.69		11200		11200	
	M24C	9/28/2016	7.41		--	31.2	J	30.1	J	2.5	U	2.5	U	0.5	U	0.5	U	2.5	U	2.5	U	112	J	141	J	2100		2030		0.663	J	0.581	J	540		541	
	M24D	9/27/2016	6.87		--	200		20	U	2.5	U	0.5	U	42.4		35.2		189		2.23		11500		100	U	4780		4630		177		0.1	U	10700		9250	
	M25	6/29/2016	6.28		21553	696		49.7	J	2.5	U	0.5	U	0.5	U	0.336		2.5	U	1.28		100	U	100	U	90.7		89.8		0.5	U	0.1	U	58.4		64.1	
	M25	9/27/2016	6.12		9317	1840		266		2.5	U	0.5	U	0.54	J	0.622		2.5	U	1.2		159	J	100	U	207		202		0.5	U	0.1	U	104		111	
Grand Mogul Mine	CC01C	6/29/2016	3.59		--	2010		1850		2.5	U	1.56	J	18.7		17.6		470		462		2410		2210		1720		1660		39.7		38.2		3650		3660	
	CC01C	9/28/2016	4.10		3.6	10300		9720		37.1		39		95.4		97		2620		2620		57900		55100		6120		6050		27.9		26.4		24500		25100	
	CC01C1	6/29/2016	3.17		--	4570		4190		3.85	J	5.54		41.7		35.1	J	1440		1360		10000		12700		3760		3570		33.7		33		8850		8550	
	CC01C1	9/28/2016	3.96	9/20/2016	2.8	15000		14100		20.3		21.8		127		130		5080		5070		54600		52200		11400		11300		7.59		7.12		31300		31600	
	CC01C2	6/29/2016	3.42		73	2960		2750		2.5	U	0.617	J	23.1		21.5		733		708		3030		2850		2180		2090		28.1		26.9		4680		4660	
	CC01C2	9/28/2016	4.12		9.0	8090		7730		2.5	U	2.94		69.1		62.9		2220		2130		9380		8900		5730		5610		22.1		21.5		14900		14700	
	CC01F	6/29/2016	7.27		--	238		97.6		2.5	U	0.5	U	1.19		1.2		31.1		20.6		100	U	100	U	82.5		78.2		8.04		3.8		267		261	
	CC01F	9/28/2016	7.16		--	372		114		2.5	U	0.5	U	2.7		2.77		59		29.7		100	U	100	U	126		123		2.93							

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						Metal Concentrations (µg/L)																															
						Aluminum				Arsenic				Cadmium				Copper				Iron				Manganese				Lead				Zinc			
						T		D		T		D		T		D		T		D		T		D		T		D		T		D		T		D	
Mine Location	Station Name	Analytical Sample Date	pH	Flow Measurement Date*	Flow (gpm)	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q		
Natalie/Occidental Mine	CC14	6/10/2015	6.09		--	1830		1150		4.46	J	1.88	J	5.25		4.68		86.9		67.6		19800		18000		1980		1940		7.3		0.339		843		884	
	CC14	9/29/2015	6.32		--	920		664		2.5	U	2.5	U	1.82		1.78		7.78		3.51	J	19600		18100		2630		2680		3.41		0.557	J	732		751	
	CC14	6/9/2016	6.13		--	2440		1900		2.5	U	5	U	5.59		5.9		90.8		75.9		27200		27200		2670		2680		9.84		1.63	J	1130		1150	
	CC14	9/29/2016	5.39	9/21/2016	407	955		791		2.53	J	2.94	J	1.87		1.87		7.17		3.16	J	18600		17600		2520		2480		3.17		0.536	J	704		673	
	CC15	6/9/2016	--		7277	643		91.6		2.5	U	0.5	U	0.5	U	0.271		8.71		4.97		796		100	U	84.3		81.2		0.579	J	0.1	U	61.6		64.6	
	CC15	9/29/2016	7.00		301	446		95.8		2.5	U	0.5	U	0.5	U	0.226		5.38		2.92		145	J	100	U	64.2		63.5		0.5	U	0.1	U	36		36.1	
	CC15A	6/9/2016	--		7206	751		177		2.5	U	0.5	U	0.787	J	0.831		15.8		10.2		2920		2530		325		331		1.28		0.1	U	165		171	
	CC15A	9/29/2016	6.80		1170	868		267		2.5	U	2.5	U	1.16		1.2		8.95		4.21	J	9330		8340		1410		1390		1.93		0.5	U	403		391	
Henrietta Mine	CC24G	6/30/2016	4.61		--	1840		1790		2.72	J	3.5		0.5	U	0.293		36.9		35.8		20900		20400		72.9		75.6		3.3		3.17		116		123	
	CC22D	6/8/2016	5.76		--	488		84.4		2.5	U	0.5	U	1.65		1.61		46.1		37.1		944		127	J	92.1		73.4		31.4		8.1		406		432	
	CC22D	9/29/2016	5.79		73	1130		124		2.5	U	0.5	U	1.7		1.74		42.6		28.9		1440		211	J	307		289		59.9		18.3		435		400	
	CC22B	6/8/2016	4.73		--	811		622		2.5	U	0.5	U	1.11		1.22		34		33.8		663		312		110		109		23.9		18.1		302		333	
	CC22B	9/29/2016	4.33		131	3600		3120		2.5	U	0.5	U	1.43		1.61		33.6		33.3		533		347		584		567		43.8		40.3		376		372	
	CC24B	6/8/2016	4.37		--	904		666		2.5	U	0.848	J	1.08		1.29		58.9		57.9		1210		769		124		119		25.6		18.9		330		342	
	CC24B	9/29/2016	3.93		166	2790		2460		2.5	U	0.5	U	2.03		2.32		106		107		1740		1450		506		498		44.5		44.2		549		571	
Anglo Saxon Mine	CC37	6/7/2016	6.53		41	500		477		7.91	J	6.93	J	2.75		2.52		7.68		7.03		28200		28400		8940		9050		10.3		2.04		2930		3040	
	CC37	9/28/2016	6.53		41	458		433		7.17	J	6.78	J	2.26		2.36		5.21		4.09	J	28700		25700		8700		8580		8.44		0.964	J	2830		2850	
	CC38	6/7/2016	7.43		--	1160		86.5		2.6	J	0.5	U	0.5	U	0.363		11.9		6.54		2260		556		640		592		31.1		2.73		179		162	
	CC38	9/28/2016	7.25		37	438		61.4		2.96	J	2.5	U	2.11		1.97		18.8		2.58	J	11600		6300		7860		7770		8.73		0.5	U	1790		1640	
	CC38B	6/7/2016	6.15		59	885		790		6.39	J	3.32	J	2.06		2.08		58.8		65.9		20500		16300		11600		11600		9.54		0.542	J	2290		2450	
	CC38B	9/28/2016	6.67		36	638		211		5.93	J	3.36	J	1.95		1.81		24.4		7.69		21800		17300		12400		12100		3.89		0.5	U	2530		2480	
	CC38C	6/7/2016	7.07		--	1530		104		2.5	U	0.5	U	0.5	U	0.206		19.9		5.06		2160		100	U	105		18.2		110		2.85		103		49.5	
	CC38C	9/28/2016	7.32		15	266		95.8		2.5	U	0.5	U	2.2		2.46		20.2		10.9		107	J	100	U	91		89.9		24.4		9.58		533		555	
	CC39	6/7/2016	5.26		--	2140		643		4.72	J	0.5	U	2.26		2.19		70.1		53.9		6800		2100		932		869		50.9		5.29		669		658	
	CC39	9/27/2016	3.62		7970	6770		5930		6.93	J	2.6	J	5.72		5.78		108		99.7		14800		10000		4460		4400		44.7		20.5		2400		2330	
	CC39B	6/7/2016	5.10		--	2230		913		5.76	J	0.5	U	2.41		2.33		69.3		58.7		6790		2330		917		834		58.8		8.64		657		679	
	CC39B	9/28/2016	3.82		6993	6180		5760		4.78	J	2.5	U	5.43		5.49		55		59		13700		12500		4690		4700		13.7		13.5		2140		2170	
Yukon Tunnel	CC41	6/7/2016	5.16		--	2410		907		4.12	J	0.5	U	2.98		2.91		99.4		72.6		8110		2460		1060		978		43.1		5.73		858		854	
	CC41	9/27/2016	3.55		6939	6220		5520		6.49	J	2.5	U	6.63		6.36		141		96.3		12500		7480		5110		4920		27.2		17.1		2610		2420	
	CC43C	6/7/2016	6.82		--	533		171		2.5	U	2.5	U	0.5	U	0.5	U	11.6		3.98	J	2460		1190		793		768		2.76		0.5	U	109		100	
	CC43C	9/27/2016	6.68		--	486		168		2.5	U	2.5	U	0.5	U	0.5	U	12.2		2.94	J	2440		1110		1130		1090		2.65		0.5	U	121		108	
	CC43D	6/7/2016	2.98		--	30900		28200		2.5	U	0.81	J	21.4		18.4		3610		2770		42900		39300		6530		6170		3.89		4.11		5810		5720	
	CC43E	6/7/2016	5.37		--	3020		891		5.63	J	0.5	U	3		3.19		104		82.3		10000		2250		1100		977		59.4		4.52		912		919	
	CC43E	9/27/2016	3.88		7069	5630		5240		3.6	J	2.5	U	5.06		5.01		84.9		81.9		10100		7080		4170		4150		15.2		13.9		2070		2050	
Boston Mine	A07D	6/28/2016	4.23		--	5970		5550		2.5	U	0.5	U	7.55		7		38.9		34.6		242	J	149	J	2160		2100		11.6		9.47		1130		1140	
	A07D	10/5/2016	4.11		9.0	16000		15100		2.5	U	0.5	U	19.1		19.5		92.5		92.5		100	U	100	U	4860		4810		7.22		7.47		2840		2830	
	A07D1	6/28/2016	4.26		55	19300		18000		2.5	U	0.5	U	33.2		32.4		55.5		51.3		100	U	100	U	6080		5890		1.52		1.26		6020		5870	
	A07D2	6/28/2016	4.31		--	2340		2150		2.5	U	0.5	U	25.5		23.8		96.2		90		100	U	100	U	824		793		22.5		18.7		3740		3680	
	A07E	6/28/2016	4.18		--	4830		4570		2.5	U	0.5	U	5.02		4.93		35.4		33		234	J	141	J	1820		1780		11.6		9.77		715		718	
	A07E	10/5/2016	3.86		49	13800		13000		2.5	U	0.5	U	12.3		13.3		64.6		68.8		311		304		5090		4950		14		15.4		2150		2120	



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Total and Dissolved Metals for 2015 and 2016 EPA/ESAT Surface Water Samples  
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						Metal Concentrations (µg/L)																															
						Aluminum				Arsenic				Cadmium				Copper				Iron				Manganese				Lead				Zinc			
						T		D		T		D		T		D		T		D		T		D		T		D		T		D		T		D	
Mine Location	Station Name	Analytical Sample Date	pH	Flow Measurement Date*	Flow (gpm)	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q		
London Mine	DM6	6/28/2016	6.13		3.2	121		88.5		2.5	U	0.5	U	8.17		8.7		30.3		30		443		324		189		197		61.7		48.3		1540		1680	
	DM6	9/30/2016	3.21		--	1220		1100		2.5	U	1.36	J	84.4		71.4		260		218		6180		4870		1640		1550		226		202		17200		17200	
	DM7	6/8/2016	6.69		--	360		23.1	J	4.25	J	0.595	J	13.8		12.8		41.3		4.53		2150		100	U	277		234		13.3		0.1	J	2930		2870	
	DM7	6/28/2016	6.05		1.1	644		41.2	J	11.9		2.58		46.2		43.2		107		9.99		4700		255		1030		984		22.1		0.23		8130		8120	
	DM7	9/30/2016	6.41	9/16/2016	0.7	929		37.9	J	14.8		2.86		49.4		42		123		6.57		7400		312		1230		1230		27.9		0.1	U	8170		8280	
	A07B1	6/28/2016	4.28		1329	7230		6790		2.5	U	0.5	U	11.3		10.8		43.5		39.8		148	J	103	J	2540		2480		11.2		9.57		1810		1790	
	A07B	9/30/2015	4.30		21	14000		13400		2.5	U	0.5	U	21.7		23		49.8		51.5		166	J	102	J	5890		6110		8.87		9.44		3990		4340	
	A07B	6/28/2016	4.323		1206	6860		6440		2.5	U	0.5	U	10.4		10.7		42.2		38.9		134	J	108	J	2380		2340		10.8		9.34		1690		1720	
Ben Butler Mine	A07B	9/30/2016	4.08		186	17100		17000		2.5	U	0.5	U	26.4		24.1		61.6		56.6		170	J	161	J	5980		5920		10.5		9.35		4260		4280	
	BB1	6/28/2016	3.97		--	546		502		2.5	U	0.5	U	10.7		10.6		192		189		373		303		92.8		89.6		830		819		2080		2050	
Mountain Queen Mine	A18	10/6/2016	7.30		--	520		87.5		2.5	U	2.5	U	2.53		2.53		46.4		27.9		123	J	100	U	498		476		0.996	J	0.5	U	374		360	
	A19A	9/30/2015	3.70		0.8	3310		3200		2.5	U	1.42	J	44.5		45.7		1270		1270		5110		5050		5750		5700		192		208		5630		6230	
	A19A	9/28/2016	--		2.7	3270		3180		2.5	U	1.32	J	43		37.9		1260		1150		5470		5100		4190		4030		139		137		5060		4920	
Vermillion Mine	CG4	9/30/2015	5.01		247	16300		15500		2.5	U	0.5	U	18.2		18.7		47.2		72.6		140	J	127	J	36400		36600		0.567	J	0.552		6030		6270	
	CG4	6/28/2016	6.58		6127	3820		2790		2.5	U	0.5	U	5.49		5.81		18.5		16		108	J	100	U	9020		9210		1.16		0.452		1550		1660	
	CG4	10/6/2016	5.47		1006	14900		12100		2.5	U	0.5	U	13.8		14.2		36.6		34.8		495		183	J	27300		26600		1.36		0.644		4380		4240	
	CG5	6/28/2016	5.48		--	628		602		2.5	U	0.5	U	7.84		7.67		61.3		60.5		100	U	100	U	472		479		47.7		44.8		1730		1900	
	CG6	9/30/2015	5.17		189	13700		12000		2.5	U	0.5	U	15.9		16.4		41.2		35.9		151	J	106	J	31600		31500		1.41		0.597		5260		5310	
	CG6	6/28/2016	6.46		7803	3620		2540		2.5	U	0.5	U	5.74		5.65		18.3		15.8		111	J	100	U	8750		8630		2.16		1.21		1560		1620	
	CG6	9/30/2016	4.97		785	11900		10400		2.5	U	0.5	U	12.2		11.1		31.8		25.6		100	U	100	U	25600		25700		0.889	J	0.414		3510		3700	
	CG6A	6/29/2016	6.57		5679	4500		2390		2.5	U	0.5	U	5.57		5.58		23.4		14.9		1150		100	U	8350		8360		26.2		1.4		1580		1690	
Sunbank Group Mine	A21	9/29/2015	5.54		76	2290		815		2.5	U	0.5	U	3.85		3.93		14.2		12.6		1020		801		1880		1900		34.1		32.6		1700		1780	
	A21	6/29/2016	6.94		4916	1050		125		2.5	U	0.5	U	3.88		3.55		42.3		27.3		100	U	100	U	3120		2980		9.02		2.35		1410		1340	
	A21	9/30/2016	5.93		515	1490		304		2.5	U	0.5	U	4.03		3.65		18.1		12.4		289		248	J	1550		1480		103		7.61		1610		1560	
	A22	9/29/2015	5.97		61	340		29.7	J	2.5	U	0.5	U	1.84		1.99		8.15		4.71		100	U	100	U	346		348		4.52		2.01		1050		1150	
	A22	6/29/2016	6.99		3576	1090		148		2.5	U	0.5	U	3.65		3.62		43		31.1		100	U	100	U	3370		3250		6.09	J	1.05		1360		1360	
	A22	9/30/2016	6.46		531	1160		76.1		2.5	U	0.5	U	3.11		2.96		14.1		7.3		100	U	100	U	1250		1190		4.32		0.863		1430		1380	
	A21A	9/29/2015	4.79		16.4	13600		13500		2.5	U	1.4	J	12.1		12.1		2.5	U	1.44		16400		16300		9460		9600		194		198		4590		4930	
	A21A	6/29/2016	5.51		--	14100		13200		2.5	U	1.29	J	11.9		10.9		2.5	U	0.774	J	19200		16500		8980		8750		253		216		4300		4270	
A21A	9/30/2016	3.78		--	15100		15000		2.5	U	1.76	J	13.3		13		2.5	U	1.04		18000		17100		9160		8980		188		190		4710		4670		
Frisco/Bagley Tunnel	A12	6/9/2015	7.14		83	285		107		2.5	U	1.34	J	4.69		4.69		5.29		4.7		2390		2210		7950		8190		4.02		0.591		3500		3830	
	A12	10/1/2015	6.25		18	434		285		2.5	U	2.47		4.47		4.77		2.5	U	2.36		4390		3550		16500		16600		1.39	J	0.482		5470		6080	
	A12	6/7/2016	6.48		18	642		550		2.5	U	2.14		7.76		8.51		7.36		6.95		4450		4170		16300		16300		1.61		0.355		6640		6980	
	A12	9/28/2016	--		58	356		325		2.5	U	1.86	J	5.43		4.94		2.93	J	2.62		2450		2210		13900		13700		0.5	U	0.1	U	5090		5060	
	A13	6/9/2015	6.20		25192	1120		305		2.5	U	0.5	U	2.39		2.26		22.9		11.5		239	J	100	U	1960		1980		28.9		2.82		757		802	
	A13	9/29/2015	5.31		521	7530		5590		2.5	U	0.5	U	9.78		10.2		31.4		28.3		292		203	J	18200		18900		8.85		7.83		3500		3920	
	A13	6/7/2016	6.57		--	2060		966		2.5	U	0.5	U	2.87		2.49		28.2		8.33		633		100	U	3510		3280		106		2.44		950		859	
	A13	9/30/2016	5.43		2053	6270		4680		2.5	U	0.5	U	7.17		6.88		22.7		17.2		152	J	117	J	13400		13400		4.2		2.56		2360		2360	
	CG9	6/9/201																																			

Table 4-1  
Total and Dissolved Metals for 2015 and 2016 EPA/ESAT Surface Water Samples  
Bonita Peak Mining District, San Juan County, Colorado  
Preliminary Remedial Investigation Report

						Metal Concentrations (µg/L)																															
						Aluminum				Arsenic				Cadmium				Copper				Iron				Manganese				Lead				Zinc			
						T		D		T		D		T		D		T		D		T		D		T		D		T		D		T		D	
Mine Location	Station Name	Analytical Sample Date	pH	Flow Measurement Date*	Flow (gpm)	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q				
Columbus Mine	A10	6/9/2015	6.18		--	991		247		2.5	U	0.5	U	2.62		3.02		23.1		16.2		199	J	100	U	2100	2080		14.4		2.81		967		969		
	A10	9/29/2015	5.43		634	6280		3800		2.5	U	0.5	U	11.1		11.6		41.2		39.4		401		306		17500	18000		8.13		7.22		4130		4560		
	A10	6/7/2016	--		16137	1480		774		2.5	U	0.5	U	2.54		2.72		20.5		12.9		195	J	100	U	3160	3100		37.3		3.67		934		932		
	A10	9/29/2016	5.13		2387	5480		3790		2.5	U	0.5	U	7.69		7.48		30.9		25.1		204	J	136	J	13000	12700		5.66		4.31		2670		2630		
	A11A	6/9/2015	3.05		37	3370		3160		8.65	J	6.38		194		193		2510		2510		11700		12200		1840	1900		1010		947		47000		51200		
	A11A	9/29/2015	2.89		0.1	31000		29500		12		12		1090		896		6800		6790		61100		61100		17600	17900		254		289		278000		302000		
	A11A	6/7/2016	4.16		27	3360		3450		5.91	J	5.43		180		173		2350		2310		11300		11600		1710	1720		911		913		40300		43100		
	A11A	9/30/2016	2.85		0.3	25600		24900		14		11		1030		938		6960		6300		54700		51600		12400	12100		302		254		229000		223000		
	CG11	6/9/2015	6.26		21799	1000		222		2.5	U	0.5	U	2.11		2.28		15.8		9.39		179	J	100	U	1910	1970		10.8		1.87		696		762		
	CG11	9/29/2015	5.34		572	6610		3830		2.5	U	0.5	U	9.54		10.2		31.5		27.9		440		324		17700	17600		7.29		5.96		3930		3930		
	CG11	6/7/2016	6.46		--	1480		587		2.5	U	0.5	U	2.29		2.17		24.9		8.96		306		100	U	2690	2550		89.9		2.74		765		759	J	
CG11	9/30/2016	5.34		3305	5390		3510		2.5	U	0.5	U	6.89		6.28		22.4		17.1		173	J	163	J	12200	12100		4.15		3.23		2280		2380			
Silver Wing Mine	A28	6/9/2015	7.57		--	137		43.5	J	2.5	U	0.5	U	2.04		1.78		7.23		6.88		100	U	100	U	736	721		1.81		0.763		452		480		
	A28	9/30/2015	7.03		1754	1400		39.5	J	2.5	U	0.5	U	4.69		4.43		12.2		3.56		100	U	100	U	3870	3800		3.85		0.442		1360		1330		
	A28	6/28/2016	7.62		--	848		52		2.5	U	0.5	U	2.25		2.46		11.3		4.73		100	U	100	U	1850	1780		3.48		0.613		587		569		
	A30	6/9/2015	7.52		--	454		44.7	J	2.5	U	0.5	U	2.07		1.85		23.5		13.4		115	J	100	U	745	715		7.76		0.918		507		496		
	A30	9/30/2015	5.82		2503	1390		42.9	J	2.5	U	0.5	U	4.79		4.44		83.2		19.3		180	J	100	U	3810	3750		4.82		0.313		1440		1410		
	A30	6/7/2016	7.54		--	747		54.6		2.5	U	0.5	U	1.9		1.92		18.6		7.99		204	J	100	U	1250	1190		14.6		0.672		505		504		
	A29	6/9/2015	6.42		--	1380		428		99.7		2.5	U	14		14.1		6190		2320		10900		2470		3100	3120		25.8		0.5	U	3950		4010		
	A29	9/30/2015	5.74		--	1860		958		132		4.4		16.6		15.1		10200		4200		16000		6130		3520	3480		25.5		0.1	U	4320		4500		
	A29	6/7/2016	6.49		7.3	1590		762		161		2.87		16.1		16.4		6280		2730		13700		3870		3300	3170		22.7		0.1	U	4220		4260		
	A29	9/28/2016	--		--	1590		603		110		3.1		14.8		14.6		6970		2770		11700		2790		3290	3250		19.1		0.159	J	4020		3870		
	A29A	6/9/2015	6.96		--	825		31.5	J	39.7		2.5	U	13.4		13.5		3820		712		5570		100	U	3030	3040		12.8		0.5	U	3790		3830		
	A29A	6/7/2016	7.08		--	1800		98.5		143		1.17	J	14.7		15.3		6660		509		15600		137	J	3070	3130		61.8		0.1	U	3900		3960		
Tom Moore Mine	A30A	6/8/2016	7.29		--	659		45.8	J	2.5	U	0.5	U	1.86		1.82		15.6		6.44		201	J	100	U	1200	1120		11.5		0.582		469		474		
	A30A	9/29/2016	6.94		--	1740		74.2		2.5	U	0.5	U	4.25		3.98		35.2		7.45		102	J	100	U	3760	3670		3.22		0.321		1130		1030		
	A30B	6/8/2016	7.45		--	602		47.3	J	2.5	U	0.5	U	1.68		1.71		14.5		5.98		204	J	100	U	1100	1010		12.1		0.532		433		433		
	A30B	9/29/2016	6.97		7096	1810		67.5		2.5	U	0.5	U	4.09		3.98		53.4		7.79		128	J	100	U	3670	3580		3.48		0.339		1120		1020		
	DM22	6/28/2016	7.31		--	29.6	J	23.3	J	2.5	U	0.5	U	1.14		1.18		2.5	U	0.515	J	100	U	100	U	409	411		0.826	J	0.284		627		673		
	DM22	9/28/2016	--		21	27.1	J	23.9	J	2.5	U	0.5	U	0.77	J	0.811		2.5	U	0.598	J	100	U	100	U	165	156		0.5	U	0.1	U	572		619		
Ben Franklin Mine	ARD1	9/29/2015	3.10		--	7180		6370		2.5	U	0.558	J	57.5		55.6		1940		1970		3560		2390		22300	22300		840		861		19900		19500		
	ARD1	6/28/2016	2.76		--	3860		3630		2.5	U	0.5	U	43.8		41		1990		1880		5520		5190		12700	12300		745		720		12500		12300		
	ARD1	9/28/2016	3.12		--	9980		9650		2.5	U	2.5	U	79.7		72.9		2690		2420		4080		3940		26000	26100		747		686		23000		24300		
	EG3A	9/29/2015	7.25		35	63		31.7	J	2.5	U	0.5	U	0.551	J	0.588		11.4		9.78		100	U	100	U	116	107		4.18		2.45		217		215		
	EG3A	6/28/2016	6.24		4657	153		87.3		2.5	U	0.5	U	3.33		3.35		12.9		11.6		100	J	100	U	633	650		2.63		0.691		1120		1210		
	EG3A	9/29/2016	6.94		--	31.9	J	24.1	J	2.5	U	0.5	U	0.5	U	0.228		2.79	J	1.79		100	U	100	U	18.3	16.2		0.5	U	0.152	J	79.8		85.7		
	EG5	9/30/2015	7.14		--	31.8	J	25.6	J	2.5	U	0.5	U	0.5	U	0.535		6.27		5.53		100	U	100	U	53.2	53.2		1.68		1.12		221		228		
	EG5	6/28/2016	7.01		--	132		91.2		2.5	U	0.5	U	3.11		3.33		14.8		12.2		100	U	100	U	636	655		2.56		1.74		1120		1200		
	EG5	9/28/2016	7.70		222	96.5		64.4		2.5	U	0.5	U	1.18		1.18		12.2		8.05		100	U	100	U	144	144		3.11		1.48		493		529		
A39A	6/28/2016	7.59		--	133		99		2.5	U	0.5	U	3.25		3.19		16.2		13.8		100	U	100	U	607	593		3.06		2.14		1040		1030			

Table 4-1  
Total and Dissolved Metals for 2015 and 2016 EPA/ESAT Surface Water Samples  
Bonita Peak Mining District, San Juan County, Colorado  
Preliminary Remedial Investigation Report

						Metal Concentrations (µg/L)																															
						Aluminum				Arsenic				Cadmium				Copper				Iron				Manganese				Lead				Zinc			
						T		D		T		D		T		D		T		D		T		D		T		D		T		D		T		D	
Mine Location	Station Name	Analytical Sample Date	pH	Flow Measurement Date*	Flow (gpm)	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q		
Terry Tunnel	A38	6/28/2016	7.14		--	66.2		63.1		2.5	U	0.5	U	0.5	U	0.148	J	2.5	U	1.26		237	J	100	U	10600	10400		2.36		0.1	U	1180		1150		
	A38	9/28/2016	7.07		--	82.3		76.3		2.5	U	2.5	U	0.726	J	0.5	U	2.5	U	2.5	U	940		100	U	11000	10700		8.53		0.5	U	1340		1220		
	A39	9/30/2015	7.10		--	118		48.8	J-	2.5	U	0.5	U	1.2		1.08		22.8		14.6		100	U	100	U	256		250		5.01		2.23		385		393	
	A39	6/28/2016	7.55		--	133		88.6		2.5	U	0.5	U	3.06		3.06		15.6		13.7		100	U	100	U	589		568		3.13		2.12		1000		1010	
	A39	9/28/2016	7.51		--	180		109		2.5	U	0.5	U	1.73		1.61		29.7		17.9		100	U	100	U	310		305		7.6		2.09		618		630	
	EG6	6/10/2015	7.36		--	229		91		2.5	U	0.5	U	2.69		2.69		25.8		19.7		190	J	100	U	1340		1280		6.08		1.83		1110		1080	
	EG6	9/30/2015	7.22		98	20	U	20	U	2.5	U	0.5	U	0.71	J	0.794		3.98	J	4.22		100	U	100	U	96.8		94.3		0.869	J	0.796		430		429	
	EG6	6/28/2016	7.44		7133	113		80.5		2.5	U	0.5	U	2.07		1.94		11.4		9.09		100	U	100	U	417		415		2.19		1.05		671		716	
	EG6	9/28/2016	7.48		373	112		54.5		2.5	U	0.5	U	1.22		1.19		13.9		9.34		100	U	100	U	251		248		3.85		0.76		430		456	
Pride of the West Mine	A50	6/7/2016	7.75		--	201		36.8	J	2.5	U	0.5	U	11.8		12.2		54.5		16.6		209	J	100	U	401		394		42.2		7.77		2190		2130	
	A50	9/28/2016	7.67		--	137		39.3	J	2.5	U	0.5	U	7.51		7.39		26.3		9.88		122	J	100	U	239		238		17.6		4.15		1360		1350	
	CU4	6/7/2016	7.39		--	1380		57		2.5	U	0.5	U	0.5	U	0.1	U	2.8	J	0.723	J	1420		100	U	152		4.21	J	27.5		0.298		13.2	J	10	U
	CU4	9/28/2016	7.45		6610	23.3	J	20	U	2.5	U	0.5	U	0.5	U	0.1	U	6.62		0.628	J	100	U	100	U	4.47	J	3.63	J	1.9		0.149	J	10	U	10	U
	CU4A	6/7/2016	7.36		--	658		60.7		2.5	U	0.5	U	0.5	U	0.1	U	3.88	J	0.93	J	770		100	U	174		4.84	J	46.4		0.488		35.1		10	U
	CU4A	9/28/2016	7.23		6739	33.9	J	20	U	2.5	U	0.5	U	0.5	U	0.152	J	2.5	U	0.882	J	100	U	100	U	6		4.03	J	1.27		0.296		24.3		28.6	

Notes:  
Q - qualifier  
"--" - data not available  
T - total recoverable  
D - dissolved

- value exceeds WQCC acute standards  
- value exceeds WQCC chronic standards  
J - Indicates an estimated value. The associated numerical value is the approximate concentration of the analyte in the sample  
U - Indicates compound was analyzed for, but not detected in sample. Value shown is quantitation limit of method  
gpm - gallons per minute  
µg/L - micrograms per liter  
\* - provided if flow measurement date is different from analytical sample date

**APPENDIX A – PART 2**  
**PRELIMINARY REMEDIAL INVESTIGATION REPORT**





# Preliminary Remedial Investigation Report

**U.S. Army Corps of Engineers  
Omaha District**

Interim Remedial Actions  
Bonita Peak Mining District Superfund Site  
San Juan County, Colorado



May 2018

**CDM  
Smith**

**Bonita Peak Mining District Superfund Site  
Interim Remedial Actions  
San Juan County, Colorado**

**Preliminary Remedial Investigation Report**

Contract No. W912DQ-15-D-3013

Task Order No.: DK04

May 2018

**Prepared for:**



U.S. Environmental Protection Agency

Region 8

1595 Wynkoop Street

Denver, Colorado 80202

**Prepared by:**



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**Under a contract with:**



U.S. Army Corps of Engineers

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## Acronyms and Abbreviations

Al	aluminum
AMD	acid-mine drainage
ARD	acid-rock drainage
As	arsenic
Au	gold
BPMD	Bonita Peak Mining District
Cd	cadmium
CDM Smith	CDM Federal Programs Corporation
CDMG	Colorado Division of Minerals and Geology
CDPHE	Colorado Department of Public Health and the Environment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
Cfs	cubic feet per second
CGS	Colorado Geological Survey
Cu	copper
cy	cubic yard
DRMS	Colorado Division Reclamation, Mining and Safety
IRA	interim remedial action
EPA	U.S. Environmental Protection Agency
ESAT	Environmental Services Assistance Team
Fe	iron
FFS	focused feasibility study
gpm	gallons per minute
GPS	global positioning system
Hg	mercury
HRS	Hazard Ranking System
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MIW	mining-influenced water
ml	milliliter
Mn	manganese
NGVD29	National Geodetic Vertical Datum of 1929
NOAA	National Oceanic and Atmospheric Administration
NPL	National Priorities List
NRCS	U.S. Department of Agriculture Natural Resource Conservation Service
Pb	lead
RI	remedial investigation
Site	BPMD Superfund Site
SPLP	synthetic precipitation leaching procedure
su	standard units
TechLaw	TechLaw, Inc.
TVS	table value standard
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey
WQCC	Water Quality Control Commission
Zn	zinc
°F	degrees Fahrenheit
µg/L	micrograms per liter

# Section 1

## Introduction

This preliminary remedial investigation (RI) report for the Bonita Peak Mining District (BPMD) Superfund Site (Site) in San Juan County, Colorado was prepared by CDM Federal Programs Corporation (CDM Smith) for the U.S. Army Corps of Engineers (USACE) Omaha District on behalf of the U.S. Environmental Protection Agency (EPA) Region 8. This preliminary RI was prepared as part of Task Order No. DK04 under USACE Contract No. W912DQ-15-D-3013 and was generally developed in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan (40 Code of Federal Regulations 300.430(e)) and EPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA* (EPA 1988). This preliminary RI is intended to meet the requirements of a preliminary site characterization summary detailed in EPA 1988 and includes a summary of site data collected under the initial field sampling program.

The Hazard Ranking System documentation record for the Site (EPA 2016a) indicated there are 48 mining-related sources where ongoing characterization and risk evaluation is needed to determine whether and what additional actions under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) may be appropriate. The Site-wide RI and risk assessments are ongoing and will provide information to guide Site-wide objectives. EPA is taking an adaptive management approach to the Site, and data and observations from the initial characterization identified 26 mining-related sources (including two dispersed campground areas) with contaminant migration issues that could be initially addressed through interim remedial actions (IRAs) while the Site-wide RI is ongoing.

The purpose of this preliminary RI report is to summarize the available data and document the current understanding of the nature of mining-related contamination associated with 26 of the mining-related sources under consideration for IRAs, in support of the focused feasibility study (FFS).

### 1.1 Site Description and Background

This section presents an overview of the general Site location, climate, and history. **Figure 1-1** shows the general location of the Site.

#### 1.1.1 Site Location and Setting

The Site is centered in southwestern Colorado in San Juan County. It spans across five different U.S. Geological Survey (USGS) 7.5-Minute Topographic Quadrangles including Handies Peak, Howardsville, Ironton, Ophir, and Silverton (USGS 2016a through 2016e). Within the Site, there are three main drainages (Mineral Creek, Cement Creek, and Upper Animas River) that flow into the Animas River at Silverton, Colorado as shown in **Figures 1-2, 1-3, and 1-4**, respectively.

Mineral Creek originates at the top of Red Mountain Pass and flows approximately 9.3 miles before entering the Animas River southwest of Silverton. Cement Creek is approximately 8 miles long, flowing from north to south before the confluence with the Animas River at Silverton (Herron et al. 1998). The Upper Animas River begins approximately 14 miles northeast of

Silverton. After the three main drainages combine as the Animas River, it flows south from Silverton to Durango, Colorado, crosses into New Mexico, and joins the San Juan River in Farmington, New Mexico.

Formed from Pleistocene glaciation and Holocene erosion, the terrain of the western San Juan Mountains is steep and rugged (USGS 2007a). The elevation ranges from approximately 9,500 feet National Geodetic Vertical Datum of 1929 (NGVD29) at the Mayflower Tailings to 12,800 feet NGVD29 at the Mountain Queen Mine, the highest mining-related source at the Site.

### 1.1.2 Site Mining History

The three main drainages within the Site contain some 400 abandoned or inactive mines where large- to small-scale mining operations occurred. San Juan County is comprised of 10 historic mining districts (Colorado Geological Survey [CGS] 2017a). Historic mining districts within the Mineral Creek, Cement Creek, and Upper Animas River drainages (referred to as “the mining districts”) include Animas, Animas Forks, Cement Creek, Eureka, Ice Lake Basin, and Mineral Point. The discovery of gold and silver brought miners to the Silverton area and the Animas Mining District in the early 1870s. In the late 1870s and early 1880s, the completion of roads, railroads, and construction of a smelter in Durango encouraged mining operations. The discovery of silver in the base-metal ores was the major factor in establishing Silverton as a permanent settlement (TechLaw, Inc. [TechLaw] 2017). Between 1870 and 1890, the richer ore deposits were discovered and mined to the extent possible. Not until 1890 was any serious attempt made to mine and concentrate the larger low-grade ore bodies in the area. By 1900, there were 12 concentration mills in the valley sending products to the Kendrick and Gelder Smelter near the mouth of Cement Creek. Mining and milling operations slowed down circa 1905, and mines were consolidated into fewer and larger operations with the facilities for milling large volumes of ore. After 1907, mining and milling continued throughout the basin whenever prices were favorable (TechLaw 2017).

Gladstone, located about eight miles upstream of Silverton on Cement Creek, is the site of a historic mining town developed in the 1880s commensurate with the onset of mining in the surrounding area. The town was the central location and railroad terminus for the milling and shipping of mine ores from the surrounding 3-square-mile valley. The town declined in the 1920s and no remnants of the town remain.

Eureka is located approximately 8 miles northeast of Silverton at the confluence of Upper Animas River and Eureka Gulch. Some of the mines located up Eureka Gulch include Sunnyside Mine, Clipper Mine, Ben Franklin Mine, Bavarian Mine, Midway Mine, Moonbeam Mine, and Ransom Mine (Herron et al. 2000). The Sunnyside Flotation Mill in Eureka was built in 1917 with a 600-ton-per-day capacity. Two settling ponds were built in the Animas River valley but after the mill was abandoned in 1949, the tailings dams were partially washed out and tailings were washed down the Animas River (Church et al. 2007). By the 1970s, only one year-round active mine (Sunnyside Mine) remained in the county (CGS 2017b). This mine ceased production in 1991.

Animas Forks, named for the three forks of the Animas River, is located 12 miles northeast of Silverton in San Juan County, CO and was first established in 1874. There were numerous mines located upstream of Animas Forks. The town started to decline in 1910 when the Gold Prince Mill ceased operation and became a ghost town in the 1920s.

### 1.1.3 NPL Listing

The Site was proposed for addition to the National Priorities List in April 2016 and the listing became effective in September 2016 (EPA 2016c).

### 1.1.4 Climate

The portions of the Site within San Juan County have a subalpine to alpine climate with snowy, cold winters and cool summers. In the subalpine climate region, the minimum and maximum mean temperatures for January and July are 2 degrees Fahrenheit (°F)/32°F and 40°F/74°F, respectively (Chapman et al. 2006). In the alpine climate region, the minimum and maximum mean temperatures for January and July are minus 8°F/24°F and 36°F/72°F, respectively (Chapman et al. 2006).

Long-term climate data, including precipitation, for Silverton, Colorado has been collected by a participating National Weather Service Cooperative Observing Program weather station. The National Oceanic and Atmospheric Administration (NOAA) has a record of climate data for the Silverton, Colorado station dating back to 1905 (NOAA 2018). The weather station is currently located at a latitude of 37.809 North and a longitude of 107.663 West. In 2016, the Silverton station recorded annual precipitation of approximately 19 inches (NOAA 2018). The greatest amount of snowfall is between November and April, with an average snowfall of 12 feet per year (EPA 2016b).

### 1.1.5 Geology

The geology of the Site within San Juan County is relevant to the assessment of the hydrogeological framework and understanding of potential source materials present. Therefore, this section focuses on the description of the bedrock geology and ore mineralization. Other aspects of the Site geology were described by Yager and Bove (USGS 2007a), Burbank and Luedke (1969), and Free et al. (1989).

#### 1.1.5.1 Stratigraphy

The Site is centered in the western San Juan Mountains in the area of the Silverton and San Juan calderas. The younger Silverton caldera is situated within the older San Juan caldera, forming between approximately 28 and 27 million years ago (USGS 2007a). During and after the caldera formation period, volcanotectonic events occurred that introduced extensive Tertiary-aged volcanic rock and extensive mineralization within fractured host rock (USGS 2007b). Volcanic formations of the San Juan volcanic field cover land north and east of the Silverton caldera. Comprised of pyroclastic rocks and lava flows, the San Juan volcanic field lies on the Paleozoic and Mesozoic rock formation (Free et al. 1989).

The general stratigraphy in the region consists of Precambrian crystalline basement, Paleozoic to Tertiary sedimentary rocks, Tertiary volcanic rocks, and Quaternary deposits (USGS 2007a).

- Precambrian rocks underlie the Site but are only exposed at the surface south of Silverton along the Animas River and Cunningham Creek (USGS 2007b). These generally consist of amphibolite, schist, and gneiss. Mineral phases in these rocks have high acid-neutralizing capacity and influence water-rock interactions (USGS 2007a).



- Paleozoic, Mesozoic, and Tertiary sedimentary rocks are primarily exposed south of Silverton along the Animas River and west in the basins draining South Fork Mineral Creek (USGS 2007a). These units are of varying thicknesses and compositions including conglomerates, sandstones, siltstones, shales, limestones, and other types of sedimentary rocks as discussed in Yager and Bove (USGS 2007a).
- Tertiary volcanic rocks comprise the bulk of the exposed rocks in the region. Tertiary volcanism began approximately 35 Ma with deposition of the San Juan Formation via lava flows, eruptions forming the San Juan and Silverton calderas and subsequent collapse, and additional lava flows depositing the Silverton Volcanics Group (USGS 2007a). An extensive system of faults and veins characterize the San Juan and Silverton calderas.
  - Most of the Site is located in the collapsed Silverton caldera within the Silverton Volcanic Group (Free et al. 1989, Herron et al. 2000). Three main volcanic units compose the caldera fill (Free et al. 1989):
    - The Eureka Tuff is the lowest formation in the Silverton Volcanic Group and is a lithic rhyolitic ashflow tuff.
    - The Burns Formation is fairly uniform and most commonly composed of rhyodacite, ridged quartz-latic flows, and flow breccias and tuffs (Burbank and Luedke 1969, Free et al. 1989).
    - The Henson Formation is the uppermost formation in the Silverton Volcanic Group, primarily andestitic pyroclastites. An irregular fracture system formed in this member, characterized by layers of volcanic breccias, lapillite, and tuffite.
- Quaternary surficial deposits are the result of glaciation and weathering of bedrock in the headwaters of subbasins. The surficial deposits are either acid generating or acid neutralizing depending on their bedrock source (USGS 2007a).

#### 1.1.5.2 Ore Mineralization

Research conducted by Free et al. is the main source of mineralization information. Their research shows that mineralization occurred in two main phases 23 and 11 Ma (Free et al. 1989). Base metal mineralization occurred first, during recurring volcanic activity near a quartz-monzonite stock in the southern caldera region. Gold (Au) was mineralized epithermally from heat generated by movement of the Red Mountain porphyry stock, which is located in the north-central caldera region. It is hypothesized that meteoric hydrothermal solutions from the Red Mountain Stock funneled through the open fracture system, causing several Au-concentrating alterations. At the Site, Au was concentrated in lodes, which are ore veins in fissures and between layers of rock.

#### 1.1.5.3 Soils

Soil map units were reviewed for mining-related sources using soil survey areas from the U.S. Department of Agriculture Natural Resource Conservation Service (NRCS) (NRCS 2016).

These soil map units are based on landscape-scale similarities observed in parent material, general soil characteristics, elevation, precipitation, position within the landscape, and vegetation.



Soil surveys are generated at a 1:24,000 scale and any enlargement of maps beyond the scale of mapping could result in a decrease in accuracy of soil line placement. Due to the size of the mining-related sources and the methodology used to map soil units, some variations could be expected.

Based on the soil survey areas, the soil map units listed in Exhibit 1-1 were identified within the mining-related sources evaluated in this preliminary RI.

**Exhibit 1-1 Soil Map Units within Mining-Related Sources**

<b>Mining Related Source</b>	<b>Soil Map Units<sup>1</sup></b>
<b>Mineral Creek Drainage Basin</b>	
Longfellow Mine	250 – Snowdon-Rock outcrop complex, 30 to 65 percent slopes
Junction Mine	250 – Snowdon-Rock outcrop complex, 30 to 65 percent slopes
Koehler Tunnel	250 – Snowdon-Rock outcrop complex, 30 to 65 percent slopes
Brooklyn Mine	250 – Snowdon-Rock outcrop complex, 30 to 65 percent slopes
Bandora Mine	162 – Quazar-Varden complex, 15 to 65 percent slopes
<b>Cement Creek Drainage Basin</b>	
Grand Mogul Mine	337 – Whitecross-Rock outcrop complex, 45 to 75 percent slopes
Natalie/Occidental Mine	339 – Henson very gravelly loam, 30 to 60 percent slopes
Henrietta Mine	337 – Whitecross-Rock outcrop complex, 45 to 75 percent slopes
Mammoth Tunnel	54 – Quazar very cobbly loam, 5 to 25 percent slopes; 250 – Snowdon-Rock outcrop complex, 30 to 65 percent slopes
Anglo Saxon Mine	331 – Needleton stony loam, 30 to 65 percent slopes
Yukon Tunnel	331 – Needleton stony loam, 30 to 65 percent slopes
<b>Upper Animas River Drainage Basin</b>	
Boston Mine	337 – Whitecross-Rock outcrop complex, 45 to 75 percent slopes
London Mine	56 – Typic Cryaquents-Cryaquolls-Cryofibrists complex, 0 to 5 percent slopes; 342 – Telluride-Rock outcrop complex, 15 to 45 percent slopes; 337 – Whitecross-Rock outcrop complex, 45 to 75 percent slopes
Ben Butler Mine	342 – Telluride-Rock outcrop complex, 15 to 45 percent slopes
Mountain Queen Mine	339 – Henson very gravelly loam, 30 to 60 percent slopes
Vermillion Mine	337 – Whitecross-Rock outcrop complex, 45 to 75 percent slopes
Sunbank Group Mine	339 – Henson very gravelly loam, 30 to 60 percent slopes
Frisco/Bagley Tunnel	337 – Whitecross-Rock outcrop complex, 45 to 75 percent slopes; 56 – Typic Cryaquents-Cryaquolls-Cryofibrists complex, 0 to 5 percent slopes
Columbus Mine	337 – Whitecross-Rock outcrop complex, 45 to 75 percent slopes; 54 – Quazar very cobbly loam, 5 to 25 percent slopes
Campground 7	162 – Quazar-Varden complex, 15 to 65 percent slopes
Silver Wing Mine	162 – Quazar-Varden complex, 15 to 65 percent slopes
Tom Moore Mine	162 – Quazar-Varden complex, 15 to 65 percent slopes
Ben Franklin Mine	340 – Moran very gravelly loam, 10 to 30 percent slopes
Terry Tunnel	343 – Telluride-Rock outcrop complex, 45 to 75 percent slopes
Pride of the West Mine	251 – Rock outcrop-Snowdon complex, 45 to 75 percent slopes
Campground 4	57 – Howardsville gravelly loam, 1 to 6 percent slopes

<sup>1</sup>Only significant soil map units have been indicated; other soil map units may be present but have minimal extents within the mining-related sources.

### 1.1.6 Surface Water Hydrology

The Animas River watershed extends from the mountainous terrain in San Juan County, Colorado, south into the San Juan River in Northern New Mexico (URS Operating Services 2012). The three major tributaries of the Animas River in San Juan County include Mineral Creek, Cement Creek, and the Upper Animas River. Cement Creek enters the Upper Animas River on the east side of Silverton, Colorado. About 1 mile downstream from that confluence, Mineral Creek enters the Upper Animas River south of town. The three major tributaries are briefly described in this section.

#### 1.1.6.1 Mineral Creek Drainage Basin

The Mineral Creek gaging station (Station 09359010) is located at Silverton, Colorado at elevation 9,246 feet NGVD29 (USGS 2018a). The drainage area is 52.3 square miles (33,472 acres) (USGS 2018a). The stream gage location is shown on **Figure 1-1**. Daily stream discharge values have been recorded and averaged since 1991. The highest discharge occurs in June, with a monthly average flow of 389 cubic feet per second (cfs). The lowest discharges occur throughout January and February, with monthly average flows of 21 to 22 cfs, respectively (USGS 2018a).

#### 1.1.6.2 Cement Creek Drainage Basin

The Cement Creek watershed area is 20.1 square miles (12,864 acres) (USGS 2018b). Cement Creek occurs within the northern portion of the Animas River watershed. The Cement Creek USGS stream gage at Silverton, Colorado (Station 09358550) is located near the confluence of Cement Creek and the Animas River, at elevation 9,380 feet NGVD29 (USGS 2018b). The stream gage location is shown on **Figure 1-1**. Daily stream discharge values have been recorded and averaged since 1991. The highest discharge occurs in June, with a monthly average flow of 131 cfs. The lowest discharges occur throughout January and February, with monthly average flows of 13 cfs for both months (USGS 2018b).

#### 1.1.6.3 Upper Animas River Drainage Basin

USGS gaging station 09358000 is located approximately 700 feet upstream from the confluence of Cement Creek and the Animas River, at elevation 9,290 feet NGVD29 (USGS 2018c). The watershed area of the Animas River at Silverton measured from this station is 70.6 square miles (45,184 acres) (USGS 2018c). The stream gage location is shown on **Figure 1-1**. Daily stream discharge values have been recorded and averaged since 1991. The highest discharge occurs in June, with a monthly average flow of 503 cfs. The lowest discharges occur throughout January and February, with monthly average flows of 24 to 26 cfs, respectively (USGS 2018c).

USGS gaging station 09359020 is located about 0.7 miles downstream from the confluence of Mineral Creek and the Upper Animas River, at elevation 9,199 feet NAVD88 (USGS 2018d). The watershed area of the Animas River below Silverton measured from this station is 146 square miles (93,440 acres) (USGS 2018d). The stream gage location is shown on **Figure 1-1**. Daily stream discharge values have been recorded and averaged since 1991. The highest discharge occurs in June, with a monthly average flow of 1,050 cfs. The lowest discharges occur throughout January and February, with monthly average flows of 60 and 64 cfs, respectively (USGS 2018d).

### 1.1.7 Subsurface Hydrogeology

Years of mining and the installation of bulkheads has significantly influenced bedrock groundwater elevations within the Site. Historically, groundwater flowed along fractures and faults, with minimal leakage through bedrock, likely due to low primary permeability. With the advent of underground mining, bedrock groundwater that once followed natural fractures instead followed the new path of least resistance—the networks of tunnels in the underground mine workings. Thus, drainage and haulage tunnels form preferential flow paths for bedrock groundwater.

Permeability in the bedrock generally decreases with depth, as the overburden pressure increases, forming a near-surface aquifer within interconnected fractures and joints (Stover 2007). Additionally, permeability is greater within the welded tuffs such as the layer dividing the upper and lower members of the Burns Formation (Simon Hydro-Search 1993). Major fractures (secondary permeability) serve as one of the main conduits for groundwater flow through the bedrock system and between mine workings. It is understood that water emanating from adits originated from the bedrock groundwater systems at the Site, but the IRAs contemplated would not address sources of contamination within the bedrock groundwater systems or within mine workings. Thus, bedrock groundwater will not be discussed further in this report.

The presence and/or extent of perched groundwater in overburden material or alluvial groundwater is not currently known at the mining-related sources described in the FFS and no groundwater analytical data are available for these mining-related sources. Thus, it is unknown whether perched overburden groundwater or alluvial groundwater is present at the mining-related sources.

## 1.2 Report Organization

The preliminary RI report is organized in a manner that generally conforms to EPA guidance (EPA 1988) and includes five sections as follows:

- Section 1 – Introduction. Provides the purpose and organization of the report, a brief description of the Site location and layout, and a summary of mining and regulatory activities conducted to date at the Site.
- Section 2 – Previous Investigations and Data Presented. Provides a summary of Site investigations and data presented in this report.
- Section 3 – Contaminant Sources, Fate and Transport. Provides definitions of the contaminated environmental media presented in this report and provides a discussion of the processes that transform solid phase metals and metalloids into mobile forms, and the transport pathways that create potential for harm to humans and aquatic life.
- Section 4 – Preliminary Evaluation of Environmental Data. Provides a discussion of the environmental data presented for each of the 26 mining-related sources discussed in this report.
- Section 5 – References. References and documents referred to in this report.

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## Section 2

### Previous Investigations and Data Presented

This section provides a summary and brief discussion of select previous sampling efforts and Site investigations completed by EPA/Environmental Services Assistance Team (ESAT), the Colorado Division of Minerals and Geology (CDMG), and U.S. Geological Survey (USGS), which are presented in this report. It should be noted that Site investigations are ongoing; the data presented in this report are not intended to provide a complete characterization of the individual mining-related sources nor the complete nature and extent of contamination.

References to previous reports are included where appropriate to provide Site background information and summarize historical conditions. Readily available data sets judged to be valid and usable were compiled and summarized in this report, with a focus on the data collected by EPA/ESAT in 2015 and 2016 (TechLaw 2016, 2017). The EPA/ESAT data are expected to be most representative of recent conditions at the mining-related sources discussed in this report. Data collected previously on waste rock leachability and estimated waste rock volumes collected by CDMG and USGS are also presented, as these data are expected to still be representative of current Site conditions. **Table 2-1** presents a summary of the data sources used in this report and includes an evaluation of the usability of these secondary data sources.

#### 2.1 Sampling Summaries

The following summarizes field activities completed by EPA/ESAT, CDMG, and USGS.

##### 2.1.1 1996–2000 USGS Sampling and Analysis

Field sampling by USGS of mine waste, mill tailings, and adit drainages at mining-related sources in the Animas River, Cement Creek, and Mineral Creek basins with subsequent reporting (Church et al. 2007) will be partly discussed in Section 4 of this preliminary RI report, specifically the estimated sizes of mine waste materials at each of the mining-related sources. A summary of the work is as follows:

- The purpose of the study was to describe the magnitude of contamination contributed by mine-adit water, mine-waste dumps, and mill tailings on public land.
- Visits were conducted at more than 300 mines.
- Mine-waste dump and mill-tailings samples were collected from 97 mine waste dump sites and 18 mill tailings sites, and 20 samples of unmined, altered rock were also collected. These samples of mine-waste dump material, mill tailings, and altered rocks were studied using a passive leach method.
- The size of mine-waste dumps at mines was estimated using length, width, and thickness.
- Surface water samples were collected at 108 mine portals and mine waste dumps.

- Annually, from 1997 to 2000, observations and sampling of mine adit locations was conducted in late August or early September during low-flow conditions.

### 2.1.2 1997–1999 CDMG Sampling

Field sampling by CDMG of mines in the Animas River above Eureka, Animas River below Eureka, Cement Creek, and Mineral Creek basins with subsequent reporting occurred between 1997 and 2000 (Herron et al. 1997, 1998, 1999, and 2000). This data will be discussed in Section 3 of this preliminary RI report. A summary of the work is as follows:

- Water samples were collected for metals, ions, and wet chemistry analyses for mines on both public and private land.
- Flow measurements were collected concurrent with water samples.
- Baseline water quality samples were collected in October 1996, and February and June 1997 in Cement Creek.
- Waste rock and mill tailing samples were collected at a total of 138 mines in the Upper Animas, Cement Creek, and Mineral Creek drainages. The samples were collected from the top 2 inches of soil material at a minimum of 10 and maximum of 20 locations at each mine location. The samples were composited in 1-gallon plastic bags and mixed in the field, after which 150 milliliters (ml) of sample was removed and mixed with 300 ml of deionized water in a 1-liter plastic beaker. After 90 minutes of settling, the liquid was filtered using 2-micron soil filters and measured for pH, total acidity, and specific conductance. The remaining liquid was acidified with nitric acid and shipped for laboratory analysis of metals and cations.
- The mining wastes were investigated to provide information for prioritizing future mine location reclamation activities to be performed by the Animas River Stakeholders Group.

### 2.1.3 2015 EPA/ESAT Sampling

Major 2015 EPA/ESAT field activities conducted at the Site and relevant to this report include the following:

- June 9–10, 2015 – High-flow real-time field water quality measurements, stream flow data collection, surface water sampling, photo documentation, and global positioning system (GPS) coordinate collection.
- August 4–6, 2015 – Real-time field water quality measurements, surface water sampling, soil/waste rock sampling, pore water sampling, sediment sampling, photo documentation, and GPS coordinate collection.
- September 22–26, 2015 – Low-flow real-time field water quality measurements, stream flow data collection, surface water sampling, pore water sampling, sediment sampling, photo documentation, and GPS coordinate collection.

### 2.1.4 2016 EPA/ESAT Sampling

With field support from stakeholders such as the U.S. Bureau of Land Management; Colorado Division of Reclamation, Mining, and Safety (DRMS); and the U.S. Forest Service, major 2016 EPA/ESAT field activities conducted at the Site and relevant to this report include the following:

- June 6–9, 2016 – High-flow, low elevation, real-time field water quality measurements, stream flow data collection, surface water sampling, photo documentation, and GPS coordinate collection.
- June 28–30, 2016 – High-flow, high elevation, real-time field water quality measurements, stream flow data collection, surface water sampling, photo documentation, and GPS coordinate collection.
- July 25–29, 2016 – Waste rock, campground, and road soil sampling, photo documentation, and GPS coordinate collection.
- September 27–30 and October 4–8, 2016 – Low-flow, real-time field water quality measurements, stream flow data collection, surface water sampling, sediment sampling, overbank soil sampling, pore-water sampling, photo documentation, and GPS coordinate collection.

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## Section 3

# Contaminant Sources, Fate, and Transport

### 3.1 Contaminated Environmental Media

The following subsections provide definitions for the contaminated media present at the mining-related sources discussed in detail in Section 4.

#### 3.1.1 Solid Media

Solid media are defined as mining-related solid media that release contaminants to surface water bodies and pose unacceptable risk to ecological receptors. Solid media have been subdivided into three subcategories, which are discussed in the following subsections.

##### 3.1.1.1 Mine Waste

Mine waste is a mining-related solid waste with elevated contaminant concentrations, water soluble contaminant loads, and/or acid-generating potential. It includes waste rock, ore, tailings, and contaminated fills that have been generated and/or processed during mining operations.

##### 3.1.1.2 Sediment

Sediment is a mining-related solid waste material with elevated contaminant concentrations that mainly consists of metal precipitates (i.e., sludge) from untreated mining-influenced water (MIW) that have settled from surface waters after discharge from mining-related sources (e.g., mine adits). Naturally occurring sources of sediment, which include iron fens (a location where metal precipitates form on the surface at groundwater gaining reaches of drainage basins), are present at the Site but would not be addressed as part of anticipated remedial actions. Sediment typically precipitates within Site stream banks, river bottoms, and adit portal detention ponds. Sediment may also include natural material or mine waste that has been deposited within streams or detention ponds due to erosion of adjacent natural (i.e., stream banks) or mining-related source (i.e., waste rock) material. Sediment may also generate MIW when in contact with water.

##### 3.1.1.3 Contaminated Soil

Contaminated soil is native soil that has been impacted by or mixed with other contaminated media (solid or aqueous). Native soil can be affected by either physical dispersion (e.g., erosion, wind, traffic) or hydrogeochemical dispersion of contaminants. Hydrogeochemical dispersion is a broad term that relates to leaching of metals and acidity from mine waste through MIW generation, and sequestration of dissolved metals and acidity in soils as the MIW migrates over or through them.

#### 3.1.2 Aqueous Media

Aqueous media has been subdivided into three subcategories, which are described in the following subsections.

##### 3.1.2.1 Mining-Influenced Water

MIW is water that is contaminated or influenced by mining-related activities and is a contaminant source medium where it discharges from a mine portal or contacts a solid source medium. It is a

broad term that does not specify the source of the contamination (other than a mining activity) or the pH of the water. MIW can include both acid-mine drainage (AMD) and acid-rock drainage (ARD), or water that is not acidic. AMD is metal-bearing, acidic water discharged from underground mine workings through adits, tunnels, or shafts (collectively referred to as “portals”). ARD is a similar discharge of metal-bearing acidic water resulting from water seeping or flowing through and from acid-generating materials such as pyritic waste rock, tailings piles, or mineralized rock formations. MIW forms when water and oxygen interact with sulfide-rich mine wastes, host rocks, or vein rocks. Sulfuric acid forms and can dissolve additional metals into the MIW. This MIW can discharge through adit portals and enter surface water. Both AMD and ARD provide more information about the source and nature of the water than does the term MIW; however, in this preliminary RI report, impacted water is referred to as “MIW.”

### 3.1.2.2 Surface Water

Surface water includes water within streams or natural ponds. Impacted surface water may episodically or periodically have elevated contaminant concentrations based on contact with or migration of contaminants from solid media and/or MIW. For purposes of this preliminary RI report, surface water within Mineral Creek, Cement Creek, and the Upper Animas River and tributaries will be considered the receiving water bodies at the Site.

### 3.1.2.3 Groundwater

As discussed in Section 1.1.7, groundwater at the Site may include perched groundwater, alluvial groundwater, and bedrock groundwater systems.

The presence and/or extent of perched groundwater in overburden material or alluvial groundwater is not currently known at the mining-related sources described in this preliminary RI and no groundwater analytical data are available for these mining-related sources. Thus it is unknown whether perched overburden groundwater or alluvial groundwater is present at the mining-related sources and whether any perched overburden groundwater or alluvial groundwater has been previously or currently impacted by mining-related sources. It is understood that water emanating from adits originated from the bedrock groundwater systems at the Site, but the IRAs contemplated would not address sources of contamination within the bedrock groundwater system or within mine workings. Thus, bedrock groundwater will not be discussed further in this preliminary RI report.

## 3.2 Fate and Transport of Contaminants

The sources of contaminants at specific mining-related sources at the Site are presented in Section 4.2. It should be noted that Site investigations are ongoing; the fate and transport discussion presented in this report is not intended to be complete and final for the Site. The fate and transport discussion herein is focused on currently identified issues at the Site to be addressed through implementation of the IRAs.

### 3.2.1 Overview of Fate and Transport

Contaminants at the mining-related sources within the Site, specifically metals and metalloids (which have properties of metals and non-metals, such as arsenic [As]), are present in solid phase materials at the Site (mine waste rock, tailings, soil, and bedrock outcrops) and in MIW. Adverse impacts are associated with transformation of solid phase metals and metalloids into forms that

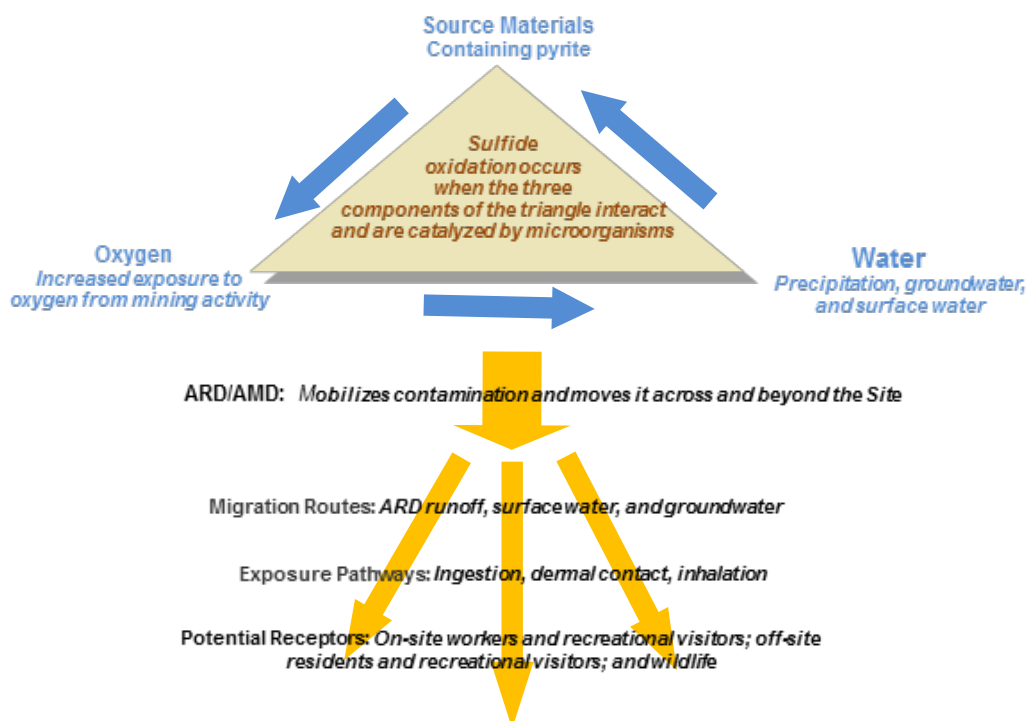
are mobile and potentially harmful to humans and ecological receptors. Crushing and grinding during mining and mineral processing may cause metals to mobilize in the form of very fine-grained particulates that can be physically transported by wind or water. Interaction with water and oxygen with sulfide minerals, especially pyrite, can result in generation of MIW and partial or complete dissolution of metals and/or metalloids from the solid phase, which provides a mechanism for contaminant migration into surface water and potentially groundwater, where it exists. These processes increase the mobility of contaminants in the environment and, therefore, increase the potential for impacts to receptors.

The releases from mining-related sources result in contamination of media, such as surface soil, surface water, sediment, and groundwater, which go on to release contaminants in many ways, including:

- Release of contaminants in surface water to sediments (through precipitation, deposition, and adsorption), biota (through uptake), and groundwater (through infiltration)
- Release of contaminated soils to surface water via erosion or to groundwater via infiltration and leaching
- Release of contaminants in soil to biota (through uptake) or air (wind-generated dust)
- Release of contaminants in groundwater to surface water
- Release of contaminants in sediment to surface water (through adsorption/desorption) and biota (through uptake)

Cycling of contaminants among Site media will also occur. For example, metals may partition between surface water and sediments and migrate between surface water and groundwater in gaining and losing stream reaches.

Numerous mining-related sources within the Site contain acidic MIW in the form of AMD and ARD. **Exhibit 3-1** presents a summary of the process of AMD and ARD formation and a description of the migration of these types of MIW in the environment.



**Exhibit 3-1 ARD and AMD Generation and Migration**

At the Site, the surface waters in the main stems of Cement Creek, Mineral Creek, and the Upper Animas River carry high loads of total and dissolved metals and high acidity into the Animas River near Silverton even though substantial dilution with cleaner water occurs. Aquatic life in the affected waterways is exposed to the elevated levels of metals.

### 3.2.2 Fate and Transport Pathways Related to IRA Implementation

The following fate and transport mechanisms are applicable to the specific issues planned to be addressed through implementation of IRAs at the Site:

- The Junction Mine, Koehler Tunnel, Mammoth Tunnel, Anglo Saxon Mine, Sunbank Group, Frisco/Bagley, and Silver Wing Mine utilize settling ponds to reduce metals concentrations from their adit MIW discharge. This allows metals to settle out of the adit discharge water through either formation of iron (Fe) oxy-hydroxides and subsequent co-precipitation (such as the case with As), or through the physical settling of undissolved metals. This process produces residual sludge in the settling ponds. If sufficient sludge and sediment accumulates in the ponds and reduces the residence time of adit discharge in the ponds, or if accumulated sludge diverts the adit discharge such that water does not flow through the settling ponds as intended, then the ability for metals to settle out of the adit discharge water is diminished.

- Several mining-related sources contain draining adits that discharge MIW onto or adjacent to mine waste piles. These MIW discharges contacting mine waste are likely to lead to increased leaching of metals from the mine waste into surface water, as well as increase erosion and transport of mine waste or contaminated soil into receiving waters. Several other mining-related sources have constructed diversions that route the MIW discharge away from mine waste but require maintenance to prevent contact between the MIW and mine waste materials.
- Stormwater run-on at mining-related sources can contact mine waste, which results in increased leaching of metals from the mine waste to surface water.
- Many mining-related sources have mine waste that has been transported in front of a flowing adit or into a stream channel. This mine waste can result in increased potential for obstructed surface water flow and subsequent uncontrolled releases and erosion of mine waste materials into surface water, as well as additional metals leaching from the obstructive mine waste into nearby surface water bodies.
- Several mine-related sources at the Site are used for recreational staging purposes or camping, and these activities have the potential to physically disturb mine waste or contaminated soil, potentially increasing the potential for human exposure to contaminants.
- Mine waste is capable of generating MIW when in contact with water (e.g., stormwater, mine portal MIW discharge). In addition, some mine waste can impede the unrestricted flow of surface water in streams and/or MIW from mine portals (e.g., adits). Mine waste obstructing free flow increases the potential for mass wasting of contamination in particulate form and/or leaching of contaminants from the mine waste as MIW.

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## Section 4

# Preliminary Evaluation of Environmental Data

Currently, EPA is collecting data to support evaluation of contributors of sources for contaminant loading of waterways and identify areas where additional data is required to evaluate the Site. The following section presents a summary of results from sampling and other field activities relevant to actions at the 26 mining-related sources discussed in this preliminary RI report. The summarized data include available recent water quality data for surface water and adit discharges, stream sediment, waste rock and soils, and mine waste leachability results. The contaminants discussed in this report include aluminum (Al), As, cadmium (Cd), copper (Cu), Fe, lead (Pb), manganese (Mn), mercury (Hg), and zinc (Zn).

### 4.1 Screening Criteria for Affected Media

MIW, surface water, and synthetic precipitation leachate procedure (SPLP) soil and waste rock results from CDMG and EPA/ESAT are discussed in the following sections and are compared to Colorado Department of Public Health and Environment (CDPHE) Water Quality Control Commission (WQCC) Regulation 34, *Classifications and Numeric Standards for San Juan River and Dolores River Basins* (CDPHE 2016). From this regulation, the following acute and chronic table value standards (TVSs) for metals were used for comparison to surface water analytical results from the Site. It is important to note that the TVSs described below are being used as screening levels for evaluation of existing environmental data, and that preliminary remedial goals have not yet been developed for the Site; therefore, these TVSs are currently not being used as cleanup criteria.

**Al (total recoverable):**

$$Acute = e^{(1.3695 * \ln[hardness] + 1.8308)}$$

$$Chronic = e^{(1.3695 * \ln[hardness] - 0.1158)} \text{ or } 87, \text{ whichever is less } (pH < 7.0)$$

$$Chronic = e^{(1.3695 * \ln[hardness] - 0.1158)} (pH > 7.0)$$

**As:** *Acute* = 340

$$Chronic = 100 \text{ (total recoverable)}$$

**Cd:**

$$Acute = (1.136672 - \ln[hardness] * 0.041838)e^{(0.9151 * \ln[hardness] - 3.1485)}$$

$$Chronic = (1.101672 - \ln[hardness] * 0.041838)e^{(0.7998 * \ln[hardness] - 4.4451)}$$

**Cu:**

$$Acute = e^{(0.9422 * \ln[hardness] - 1.7408)}$$

$$Chronic = e^{(0.8545 * \ln[hardness] - 1.7428)}$$

**Fe (total recoverable):**

*Acute = Not Applicable*

*Chronic = 1000*

**Pb:**

$$Acute = (1.46203 - \ln[hardness] * 0.145712)e^{(1.273 * \ln[hardness] - 1.46)}$$

$$Chronic = (1.46203 - \ln[hardness] * 0.145712)e^{(1.273 * \ln[hardness] - 4.705)}$$

**Mn:**

$$Acute = e^{(0.3331 * \ln[hardness] + 6.4676)}$$

$$Chronic = e^{(0.3331 * \ln[hardness] + 5.8743)}$$

**Zn:**

$$Acute = 0.978 * e^{(0.9094 * \ln[hardness] + 0.9095)}$$

$$Chronic = 0.986 * e^{(0.9094 * \ln[hardness] + 0.6235)}$$

Hardness (maximum of 400 milligrams per liter (mg/L), except for Al, for which hardness shall not exceed 220 mg/L):

$$[CaCO_3] = 2.5 * [Ca^{2+}] + 4.1 * [Mg^{2+}]$$

Concentrations of metals calculated using TVSs are in micrograms per liter (µg/L), and hardness is in milligrams per liter (mg/L) as calcium carbonate. These criteria were chosen to evaluate the surface water and SPLP data using hardness-based aquatic life criteria developed by CDPHE (CDPHE 2016) and to provide a consistent basis for evaluation of concentrations of relevant metals in surface water. At some sampling locations, the calculated TVS standard is higher than the typical federal water quality criteria, but because CDPHE WQCC Regulation 34 states that “The imposition of effluent limits required under the Federal Act for point sources and cost-effective and reasonable best-management practices for nonpoint sources are not likely to lead to the establishment of aquatic life in these segments”, these more stringent standards were not used to analyze the surface water and SPLP samples discussed in this preliminary RI report.

A summary of relevant MIW and surface water data collected in 2015 and 2016 by ESAT and comparison to applicable WQCC standards is provided in **Table 4-1**, while a summary of all 2015 and 2016 analytical data for MIW and surface water is presented in **Attachment A**. Additionally, the leaching test and SPLP results from CDMG and ESAT in **Table 4-2** and **Table 4-3** are also discussed relative to these water quality standards. Acute WQCC standards are always higher than the chronic standards, and if the discussion in Section 4.2 states an exceedance of a WQCC acute standard, the chronic standard was also exceeded but will not be stated.



Total metals results from soil and waste rock samples are also discussed in Section 4.2 and are presented in **Table 4-4**, while a summary of all 2015 and 2016 analytical soil and waste rock data is presented in Attachment B. Metals results from soil and waste rock at mining-impacted recreation staging areas (e.g., established campgrounds or dispersed campsites) were compared to applicable human health risk-based levels presented in Appendix B of the FFS. These screening levels (in units of milligrams per kilograms [mg/kg]) are presented in **Exhibit 4-1**.

**Exhibit 4-1 Soils and Waste Rock Metals Human Health Risk-Based Levels**

Soil and Waste Rock Risk Based Levels (mg/kg)		
Analyte	As	Pb
Campground Soil	122	2,081
Waste Rock	1,419	NA

Additionally, total metals results from sediment samples are discussed in Section 4.2 and are presented in **Table 4-5**. The analytical results from these sediment samples were compared to ecological risk-based screening levels based on Macdonald et al. (2000) and Ingersoll et al. (1996). These screening levels are provided in **Exhibit 4-2**.

**Exhibit 4-2 Sediments Metals Screening Levels**

Sediment Concentration Screening Levels (mg/kg)								
Al	As	Cd	Cu	Fe	Pb	Mn	Hg	Zn
26,000	9.79	0.99	31.6	188,400	35.8	631	0.18	121

The following discusses historical sampling results conducted at each of the 26 mining-related sources. To present information about the mining-related sources in a manner that accounts for the locations of the mining-related sources within the watersheds, Section 4.2 groups mining-related sources into subareas for discussion. These subareas are generally shown on **Figures 1-1 through 1-4**.

## 4.2 Sampling Results at Mining-Related Sources – Mineral Creek Headwaters

### 4.2.1 Longfellow Mine

The Longfellow Mine is located at the headwaters of Mineral Creek at an elevation of approximately 11,160 feet National Geodetic Vertical Datum of 1929 (NGVD29) near the top of Red Mountain Pass just east of U.S. Highway 550 and is readily accessible to the public. This mining-related source is adjacent to the Junction Mine and Koehler Tunnel. Water flows from upgradient areas into a diversion channel around an onsite waste rock pile, and into the Mineral Creek Headwaters. A wooden shaft house and shaft are present at the waste rock pile. **Figure 4-1** shows sample locations and other features of this mining-related source.

According to CDMG (Herron et al. 1997), approximately 32,000 cubic yards (cy) of mine waste from the Longfellow Mine, Junction Mine, and Koehler Tunnel was removed by Sunnyside Gold

Corporation in 1996 and 1997 to the Mayflower tailings repository near Silverton. Most of the remaining waste rock at the Longfellow Mine has been capped.

The following sections describe results of analyses conducted for Longfellow Mine surface water, SPLP, soils, waste rock, and sediments, as provided in **Tables 4-1 through 4-5**.

#### **4.2.1.1 Longfellow Mine Surface Water**

In 2016, one water quality sampling location was sampled for the Longfellow Mine (**Table 4-1**) at a surface water location north of the shaft house (M02D) (**Figure 4-1**). The measured flow rate was higher during high-flow conditions in June, at 15 gallons per minute (gpm), than in October during low-flow (4.9 gpm). The pH was only marginally lower in the June sample compared to October sample (6.61 standard units [su] versus 6.83 su).

The June 2016 sample exceeded the acute aquatic life standards (acute standards) for Cu, and chronic aquatic life standards (chronic standards) for Al. The October 2016 sample exceeded the chronic standards for Al and Cu.

#### **4.2.1.2 Longfellow Mine CDMG and EPA/ESAT Waste Rock SPLP**

No waste rock samples were collected at the Longfellow Mine during the CDMG investigation, and USGS estimates that there was 5,500 cy of waste rock material onsite (**Table 4-2**). However, an SPLP test was conducted on waste rock collected in July 2016 at the Longfellow Mine (WR-M02B) (**Table 4-3**) and the results exceeded the chronic standard for Pb.

#### **4.2.1.3 Longfellow Mine Soils, Waste Rock, and Sediment**

As shown in **Table 4-4**, a waste rock sample collected from WR-M02B in July 2016 exceeded the waste rock human health risk-based level for As.

No sediment samples (**Table 4-5**) were collected from the Longfellow mine in 2015 or 2016.

### **4.2.2 Junction Mine**

The Junction Mine is located at the headwaters of Mineral Creek at an elevation of approximately 11,160 feet NGVD29 near the top of Red Mountain Pass just east of U.S. Highway 550, and thus is readily accessible to the public. This mining-related source is adjacent to the Koehler Tunnel and Longfellow Mine. A draining adit is present, and water from the adit flows into an onsite pond that combines with flow from the discharging adit at the Koehler Mine. There is visible precipitate formation in the pond, and soil around the adit flow exhibits staining, indicating seasonally higher flows of MIW. **Figure 4-1** shows sample locations and other features of this mining-related source.

According to CDMG (Herron et al. 1997), approximately 32,000 cy of mine waste from the Longfellow Mine, Junction Mine, and Koehler Tunnel was removed by Sunnyside Gold Corporation in 1996 and 1997 to the tailings repository near Silverton.

The following sections describe results of analyses conducted for Junction Mine surface water, SPLP, soils, waste rock, and sediments, as provided in **Tables 4-1 through 4-5**.

#### 4.2.2.1 Junction Mine Adit Discharge

In 2016, one water quality sampling location was sampled for the Junction Mine (**Table 4-1**) at the adit (M02B) (**Figure 4-1**). The measured flow rate was higher during high-flow conditions in June at 12 gpm, than in October during low-flow (2.9 gpm). The adit water quality data indicate dilution with higher flows, because concentrations were higher in the October sample than the June sample, and the pH was significantly lower (3.86 su in October versus 6.15 su in June).

The June and October 2016 adit samples exceeded acute aquatic life standards (acute standards) for Cd, Cu, and Zn, and chronic aquatic life standards (chronic standards) for Al, As, and Fe. The chronic and acute standards for Pb were also exceeded for the June and October adit samples, respectively.

#### 4.2.2.2 Junction Mine CDMG and EPA/ESAT Waste Rock SPLP

No waste rock samples were collected at the Junction Mine during the CDMG investigation. However, one SPLP test was conducted on waste rock collected in July 2016 at the Junction Mine (WR-M02D) (**Table 4-3**). The SPLP results exceeded the acute standards for Cd, Cu, Pb, and Zn, and the chronic standard for Al. This indicates that despite the removal of the majority of waste rock at this mining-related source, impacted solid media remains that generates leachate exceeding surface water quality standards.

#### 4.2.2.3 Junction Mine Soils, Waste Rock, and Sediment

As shown in **Table 4-4**, a waste rock sample collected from WR-M02D in July 2016 exceeded the human health risk-based level for As.

Per **Table 4-5**, a sediment sample (M02E) collected from the settling pond collected in October 2016 exceeded sediment ecological screening levels (sediment screening levels) for As, Cd, Cu, Pb, Hg, and Zn. Concentrations of As, Cd, Cu, and Zn in this pond sediment sample were the highest among Mineral Creek mining-related sources.

### 4.2.3 Koehler Tunnel

The Koehler Tunnel is located in upper Mineral Creek at an elevation of 11,160 feet NGVD29 near the top of Red Mountain Pass, adjacent to the Junction and Longfellow Mines. This mining-related source is accessible to the public.

The Koehler Tunnel was bulkheaded in 2003 with additional grouting around the bulkhead in 2011 (Colorado Division of Reclamation, Mining and Safety [DRMS] 2011); however, some water still discharges from the adit and orange precipitates are present in drainage. The adit discharges down a talus slope and flows into the same pond as the Junction Mine adit discharge. According to CDMG (Herron et al. 1997), mine waste from the Junction Mine, Koehler Tunnel, and Longfellow Mine was removed by Sunnyside Gold Corporation to the tailings repository near Silverton, and most structures were removed. **Figure 4-1** shows sample locations and features of this mining-related source.

Per CDMG (Herron et al. 1997), the adit and waste rock at the Koehler mining-related source produced 52 to 56 percent of the Fe loading and over 90 percent of the Zn loading to Mineral

Creek prior to installation of the bulkhead. The bulkhead has been effective at improving water quality in the upper Mineral Creek watershed (DRMS 2011).

The following sections describe results of analyses conducted for Koehler Tunnel surface water, SPLP, soils, waste rock, and sediments, as provided in **Tables 4-1 through 4-5**.

#### **4.2.3.1 Koehler Tunnel Adit Discharge and Surface Water**

In 2016, four water quality sampling locations were collected at the Koehler Mine (**Table 4-1**). Samples were collected from a flowing pipe below the adit (M0K21), from the adit discharge (M02C), from the outlet of the pond (M02E), and from downstream of Koehler Tunnel in Mineral Creek (M02) (**Figure 4-1**). It is unknown if the pipe water sample can be compared to the adit discharge sample.

Flow from the adit (M02C) was 4.5 gpm in October 2016, and the June sample collected from the M02K1 pipe had a flow rate of only 0.1 gpm. The Koehler Tunnel adit sample had a pH of 6.12 su in October, and exceeded the acute standards for Al, As, Cd, Cu, Mn, and Zn and the chronic standard for Fe. The pipe water sample had a pH of 4.54 su in June, and exceeded the acute standards for Cd, Cu, Mn, and Zn, and the chronic standard for Al. The settling pond outlet (M02E), which contains water from both the Koehler Tunnel and the Junction Mine adit, was sampled in June and October 2016 and metals concentrations in both samples exceeded acute standards for Cd, Cu, Mn, and Zn, and chronic standards for Al, As, Fe, and Pb. The flow rate was measured in October at 9 gpm, with a pH of 3.6 su. Concentrations in the pond were generally lower than the concentrations from the adit and the pond pH was several units lower than the adit in October. Downstream in Mineral Creek (M02), in June and October, flows were 150 and 23 gpm, respectively, pH was 5.76 and 8.03 su, respectively, and acute standards for Cd, Cu, Mn, and Zn, and chronic standards for Al, Fe, and Pb, were exceeded during both sampling events.

#### **4.2.3.2 Koehler Tunnel CDMG and EPA/ESAT Waste Rock SPLP**

No waste rock samples were collected at the Koehler Mine during the CDMG investigation. However, two SPLP tests were conducted on one soil/waste rock sample collected in July 2016 at the Koehler Mine (WR-M02C) (**Table 4-3**). These SPLP tests were performed on waste rock passing a 10-sieve, which has a 0.0787-inch opening, and 60-sieve, which has a 0.0098-inch opening. For the 10- and 60-sieve samples, the SPLP results exceeded the acute standard for As, and the chronic standards for Al, Fe, and Pb. The 60-sieve sample fraction exceeded the chronic standard for Cu as well. These results indicate that despite the removal of most of the waste rock at this mining-related source, impacted solid media remains that generates leachate exceeding surface water quality standards.

#### **4.2.3.3 Koehler Tunnel Soils, Waste Rock, and Sediment**

**Table 4-4** shows results for waste rock and soil samples collected at the Koehler Tunnel. Samples were collected from waste rock/soil (WR-M02C), the onsite pond (M02E), and from downstream in Mineral Creek (M02). From the waste rock/soil at WR-M02C, concentrations of As were 13,700 mg/kg in the 10-sieve fraction and 22,200 mg/kg in the 60-sieve fraction, which were the highest among waste rock samples collected at the Site. The results from the 10-sieve and 60-sieve fractions at WR-M02C exceeded the human health risk-based level for As.

Per **Table 4-5**, as discussed for the Junction Mine above, a sediment sample from the settling pond collected in October 2016 (M02E) had the highest As, Cd, Cu, and Zn concentrations found in sediments at Mineral Creek mining-related sources. This sample exceeded sediment screening levels for As, Cd, Cu, Pb, Hg, and Zn.

## 4.3 Sampling Results at Mining-Related Sources – Browns Gulch

### 4.3.1 Brooklyn Mine

The Brooklyn Mine adit is located on the east side of Mineral Creek along a steep walled portion of Brown's Gulch at an elevation of approximately 11,400 feet NGVD29. Forest Service Road 825 passes through the site, making it accessible to the public. The Mine has a flowing adit with a metal grate, and flow is piped away from the adit to a constructed channel lined with Burns Formation rock, which has become armored and stained with orange precipitate. There are visual impacts to surface soils from surface water flow after discharge from the constructed channel. There is a possible collapsed adit located above the draining adit. There are three structures on the site, and there are two constructed ponds along Forest Service Road 825 located east of the Brooklyn Mine. A large volume of waste rock is present and a large vegetation kill zone with orange staining is seen at the base of the slope where water discharges from the channel. **Figure 4-2** shows sample locations and features of this mining-related source.

The following sections describe results of analyses conducted for the Brooklyn Mine surface water, SPLP, soils, waste rock, and sediments, as provided in **Tables 4-1 through 4-5**.

#### 4.3.1.1 Brooklyn Mine Adit Discharge and Surface Water

In 2016, five total water quality sampling locations were collected for the Brooklyn Mine (**Table 4-1**). Samples were collected from the adit (M12C), an adit diversion channel (M12D), upstream of the Brooklyn Mine in Browns Gulch (M12B), downstream of the diversion channel in Emporium Creek (which flows through Browns Gulch) (M12A), downstream of the Brooklyn Mine in Browns Gulch (before the confluence with Mineral Creek) (M12), and the two ponds along Forest Service Road 825 (M12F and M12G) (**Figure 4-2**).

In 2016, adit flow (M12C) was higher in June (7.3 gpm) than in September (1.1 gpm), while pH ranged from 3.63 to 3.84 su. It should be noted that maintenance was completed on the adit diversion piping in October 2016 to improve flow through the diversion. In September, the adit-diversion channel (M12D) pH was 3.72 su, which is similar to the adit. Upstream in Browns Gulch (M12B), June and September flows were 223 and 151 gpm, respectively, and pH ranged from 4.55 to 4.76 su. Downstream of the Brooklyn Mine, in Browns Gulch, before the confluence with Mineral Creek (M12), June and September flows were 438 and 165 gpm, respectively, and pH ranged from 4.17 to 5.08 su. In 2016, Emporium Creek, downstream of the adit diversion channel (M12A), had a flow of 151 gpm in September; pH was 4.51 su in June and 4.45 su in September. In October 2016, the northern pond sample (M12F) had a pH of 7.79 su, while the southern pond sample (M12G) had a pH of 4.07 su.

The June and September 2016 adit samples exceeded acute standards for Cd, Cu, Mn, and Zn, and chronic standards for Al, Pb, and Fe. The adit water quality data appear to indicate metals dilution

with higher flows because concentrations were higher in the two September adit samples than the June sample. In the adit diversion channel in September, metals concentrations were similar to the adit. Between upstream and downstream of the Brooklyn Mine in Browns Gulch, Cd and Zn concentrations increased such that they exceeded chronic and acute standards, respectively. The sample collected from one pond (location M12F) in October 2016 did not exceed any acute or chronic water quality standards, while the sample from pond location M12G in October 2016 exceeded acute standards for Cu, Pb, and Zn, and chronic standards for Al and Cd.

#### 4.3.1.2 Brooklyn Mine CDMG and EPA/ESAT Waste Rock SPLP

Three leachate samples were collected by CDMG from waste rock at the Brooklyn Mine. These waste rock samples all exceeded the acute standards for Al, Cd, Cu, Mn, Pb, and Zn, and the chronic standards for Fe. USGS estimated 15,000 cy of waste rock material onsite.

Per **Table 4-3**, three SPLP samples were analyzed from waste rock samples collected in July 2016 at the Brooklyn Mine (WR-M12, WR1-M12, and WR2-M12). For the WR-M12 sample near the adit, SPLP results exceeded the acute standards for Cu, Pb, and Zn, and the chronic standards for Al, Fe, and Pb. For the WR1-M12 sample collected from waste rock below the adit, the acute standards were exceeded for Cd, Cu, Mn, Pb, and Zn, and chronic standards for Al and Fe, while the WR2-M12 sample also exceeded the acute standard for Al. The WR1-M12 waste rock sample had the highest Al, Fe, and Mn concentrations of any SPLP sample collected for the Mineral Creek mining-related sources.

#### 4.3.1.3 Brooklyn Mine Soils, Waste Rock, and Sediment

Per **Table 4-4**, samples were collected from the Brooklyn Mine at three waste rock pile locations (WR-M12, WR1-M12, and WR2-M12), onsite adit soil (M12C), two adit channel locations (M12D, and M12E), upstream of the mine in Browns Gulch (M12B), in Emporium Creek after the diversion channel (M12A), and downstream of the mine in Browns Gulch (M12).

Per **Table 4-5**, sediment samples were collected at eight locations in 2016 at the Brooklyn Mine. The two adit discharge sample exceeded sediment screening levels for As, Cu, Pb, Hg, and Zn. The Brown's Gulch upstream sample exceeded sediment screening levels for As, Cu, Pb, Mn, and Zn, while the Brown's Gulch downstream sample only exceeded sediment screening levels for As and Pb. Within the adit drainage channel, the first sampling location M12E exceeded sediment screening levels for As, Cu, Fe, Pb, and Zn, the second sampling location M12D exceeded sediment screening levels for Al, As, Cd, Cu, Fe, Pb, Mn, and Zn, while the third sampling location M12A only exceeded sediment screening levels for As and Pb. Two samples collected at the two ponds present east of the Brooklyn Mine (M12F and M12G) exceeded sediment screening levels for As, Cd, Cu, Pb, and Zn.

## 4.4 Sampling Results at Mining-Related Sources – South Fork Mineral Creek

### 4.4.1 Bandora Mine

The Bandora Mine is located west of Mineral Creek along the South Fork at an elevation range between 10,690 feet to 11,000 feet NGVD29. The mine is situated on a uniform, southeast-facing, steep mountain slope in a forested subalpine terrain just below timberline. The mine is visible



from County Road 585 and is accessible to the public. The mine has two flowing adits. The main adit is collapsed and discharge from both adits flow in a diversion channel to the northeast and then downslope and across the road into the South Fork of Mineral Creek. Large amounts of orange precipitates are visible in flow channels and on rocks. There are two dilapidated structures onsite. **Figure 4-3** shows sample locations and features of this mining-related source.

The following sections describe results of analyses conducted for the Bandora Mine surface water, SPLP, soils, waste rock, and sediments, as provided in **Tables 4-1 through 4-5**.

#### 4.4.1.1 Bandora Mine Adit Discharge and Surface Water

In 2016, six total water quality sampling locations were collected for the Bandora Mine (**Table 4-1**). Samples were collected from two adit locations (M24B and M24C), two samples from the adit drainage channel (M24A and M24D), upstream of Bandora Mine in the South Fork of Mineral Creek (M23), and downstream of Bandora Mine in the South Fork of Mineral Creek (M25) (**Figure 4-3**).

In September 2016, Bandora Mine adit flow at M24B was measured to be 24 gpm and had a pH of 6.71 su. In September 2016 from the lower adit location M24C, pH was 6.96 and 7.41 su, respectively. In the adit flow channel samples M24A and M24D, pH was measured at 6.96 and 6.87 su, respectively, in September. Upstream of Bandora Mine (M23), flow was 7,351 gpm in September 2016, with a pH of 5.98. In June and September 2016, downstream flow (M25) was 21,553 and 9,317 gpm, respectively, and pH was 6.28 and 6.12 su, respectively. These results indicate that there was not a noticeable change in pH within South Fork Mineral Creek across the Bandora Mine site.

The September 2016 M24B adit sample exceeded acute standards for Cd, Mn, and Zn, and chronic standards for Al, Cu, and Fe. The M24C adit sample only exceeded the acute standard for Zn. The adit flow channel samples M24A and M24D exceeded acute standards for Cd, Mn, and Zn, and chronic standards for Al and Fe. In September, both upstream and downstream samples M23 and M25 exceeded chronic standards for Al and Cd, while downstream sample M25 also exceeded the chronic standard for Zn.

#### 4.4.1.2 Bandora Mine CDMG and EPA/ESAT Waste Rock SPLP

One leachate sample was collected by CDMG from waste rock at the Bandora Mine (**Table 4-2**). The waste rock sample exceeded the acute standards for Cd, Cu, Pb, and Zn. CDMG and USGS estimated 5,500 cy of waste rock material onsite.

Per **Table 4-3**, four SPLP samples were analyzed from waste rock samples collected in July 2016 at the Bandora Mine (WR1-M24, WR2-M24, WR3-M24, and WR4-M24). All samples exceeded the acute standards for Mn, Pb, and Zn. The WR1-M24, WR2-M24, and WR3-M24 samples also exceeded acute standards for Cd and Cu, and chronic standard for Fe. The WR1-M24 and WR3-M24 samples also exceeded chronic Al standards. The WR1-M24, WR2-M24, and WR3-M24 SPLP samples had the highest Cd, Cu, Pb, and Zn levels among waste rock samples collected at the Mineral Creek mining-related sources.

#### 4.4.1.3 Bandora Mine Soils, Waste Rock, and Sediment

Per **Table 4-4**, samples were collected from the Bandora Mine at four waste rock pile locations (WR1-M24, WR2-M24, WR3-M24, and WR4-M24), the adit drainage channel above the South

Fork of Mineral Creek (M24D), an upstream location (M23), and a downstream location (M25). Waste rock samples collected at Bandora had the highest Cu concentrations in all of Mineral Creek and some of the highest Pb and Zn concentrations in all of the Site. Concentrations typically increased between the upstream and downstream points.

Per **Table 4-5**, sediment samples were collected in 2016 at locations upstream and downstream from the Bandora Mine. Metals concentrations typically increased between the upstream and downstream samples, and the downstream sample exceeded sediment screening levels for Cd, Cu, Pb, and Zn.

## 4.5 Sampling Results at Mining-Related Sources – Upper Cement Creek

### 4.5.1 Grand Mogul Mine

The Grand Mogul Mine is located in Ross Basin, about 0.5 miles east of the Mogul Mine main adit near the base of the north basin wall at an elevation of 11,800 feet NGVD29. The Grand Mogul Mine is difficult to access via a jeep trail. The main and most eastern adit is collapsed. Flow from beneath the Grand Mogul Mine waste rock travels westward over soil for approximately 650 feet before entering upper Cement Creek. The overland flow path is heavily stained with orange precipitates. Three piles of mine waste from the workings of the Grand Mogul Mine are located on the north side of Cement Creek. Flow from the collapsed eastern adit is likely seeping out of the toe of the easternmost waste rock pile. Gullies are present on the waste rock piles and the piles have a moderate degree of erosion. A large shaft or stope covered with metal grate is located at the second waste rock pile. There are no other structures onsite. **Figure 4-4** shows sample locations and features of this mining-related source.

The following sections describe results of analyses conducted for the Grand Mogul Mine surface water, SPLP, soils, waste rock, and sediments, as provided in **Tables 4-1 through 4-5**.

#### 4.5.1.1 Grand Mogul Mine Adit Discharge and Surface Water

In 2016, seven total water quality sampling locations were collected for the Grand Mogul Mine (**Table 4-1**). Samples were collected from two eastern waste rock seep locations (CC01C and CC01C1), an adit and waste rock discharge channel before confluence with Cement Creek (CC01C2), upstream of Grand Mogul Mine in Cement Creek (CC01F), Cement Creek after confluence with the adit and waste rock drainage channel (CC01H) (before confluence with Queen Anne Mine tributary), in the western waste rock drainage channel (CC02I), and downstream in Cement Creek after confluence with the western rock pile drainage and all Grand Mogul mining-related sources (CC01U) (**Figure 4-4**).

In September 2016, Grand Mogul Mine seep flows were measured at CC01C and CC01C1 at 3.6 and 2.8 gpm, respectively, with pH values of 4.1 and 3.96 su, respectively. Flows were not measured at CC01C and CC01C1 during June 2016. In the seep flow channel in June and September, CC01C2 had flows of 73 and 9 gpm, respectively, and pH values of 3.42 and 4.12 su, respectively. Flow at Cement Creek upstream location CC01F was not measured; pH in June and September was 7.27 and 7.16 su, respectively. In Cement Creek at CC02H in June and September 2016, flow was 2,904 and 368 gpm, respectively, while pH values were 6.12 and 6.31 su, respectively. In the western



waste rock pile drainage channel at CC02I, flow was 7.3 in June 2016, and pH was 4.69 su. Downstream of Grand Mogul Mine in Cement Creek at CC01U in June and September 2016, flow was 5,327 and 378 gpm, respectively, while pH was 6.16 and 5.72 su, respectively. These results indicate that the Grand Mogul Mine adversely affected pH values in Cement Creek.

In 2016, June and September adit and waste rock channel water samples CC01C, CC01C1, and CC01C2 all exceeded acute standards for Al, Cd, Cu, and Zn, and exceeded chronic standards for Fe. These three sampling points also had exceedances of acute and chronic Mn and Pb during June and September 2016, and Mn concentrations were some of the highest in Cement Creek. The Grand Mogul Mine upstream location in June and September exceeded acute standards for Cu and Zn, and chronic standards for Al and Cd. Cement Creek after confluence with the adit and waste rock drainage channel (CC01H) sample exceeded acute standards for Cd, Cu, and Zn, and the chronic standard for Al. The drainage channel for the western waste rock pile (CC02I) and the Grand Mogul Mine downstream (CC01U) samples exceeded acute standards for Cd, Cu, and Zn, and the chronic standard for Al, and the downstream sample also exceeded the chronic standard for Mn. Results presented in **Table 4-1** show that water flowing from the Grand Mogul Mine meaningfully increased concentrations of Al, Cd, Cu, Fe, Mn, and Zn in Cement Creek.

#### 4.5.1.2 Grand Mogul Mine CDMG and EPA/ESAT Waste Rock SPLP

Two leachate samples were collected by CDMG from waste rock at the Grand Mogul Mine (**Table 4-2**). These waste rock samples all exceeded the acute standards for Al, Cd, Cu, Pb, and Zn, and the chronic standards for Fe. CDMG estimated 8,000 and 9,000 cy of waste rock at the west and east waste rock piles, respectively, while USGS estimated 9,000 cy total of waste rock material onsite.

Per **Table 4-3**, three SPLP samples were analyzed from waste rock samples collected in July 2016 at the Grand Mogul Mine (WR-CC01C, WR-CC01C2, and WR-CC02A). These samples exceeded the acute standards for Cd, Cu, Pb, and Zn, and chronic standards for Al. The WR-CC01C2 and WR-CC02A samples also exceeded the chronic Fe standard. The Grand Mogul Mine WR-CC01C and WR-CC01C2 SPLP samples had the highest Cd, Cu, Pb, and Zn concentrations among waste rock samples collected at Cement Creek mining-related sources.

#### 4.5.1.3 Grand Mogul Mine Soils, Waste Rock, and Sediment

Per **Table 4-4**, samples were collected from the Grand Mogul Mine at three waste rock pile locations (WR-CC01C, WR-CC01C2, and WR-CC02A), two seep locations below the eastern waste rock piles (CC01C and CC01C1), the adit and waste rock drainage channel before confluence with Cement Creek (CC01C2), upstream of the mine in Cement Creek (CC01F), in Cement Creek after confluence with the eastern adit and waste rock discharge channel (CC01H), in a drainage channel for the western waste rock (CC02I), and downstream of all Grand Mogul mining-related sources in Cement Creek (CC01U). The WR-CC01C and WR-CC01C2 waste rock samples had the highest Pb and Zn concentrations among Cement Creek mining-related sources, and the CC01C2 drainage channel location had the highest Al, Cd, and Mn concentrations of any sample collected among the Cement Creek mining-related sources.

Per **Table 4-5**, sediment samples were collected in 2016 at seven locations at the Grand Mogul Mine. All samples exceeded sediment screening levels for As, Cu, Pb, Mn, and Zn, and all samples except for CC01C also exceeded sediment screening levels for Cd.

## 4.6 Sampling Results at Mining-Related Sources – Gladstone Area

### 4.6.1 Natalie/Occidental Mine

The Natalie/Occidental mine is located one mile southeast of Gladstone on the north side of the South Fork of Cement Creek, directly across from the Big Colorado Mine. The discharging adit elevation is at 11,000 feet NGVD29. The Natalie/Occidental Mine is accessible via a county road and is accessible to the public. The primary discharging adit is covered with a grate, and a possible collapsed adit and exploration pit are upslope of the primary adit. The adit discharge flows southwest over soil and adjacent to waste rock for approximately 240 feet before entering the South Fork of Cement Creek. Heavy orange precipitate is observed throughout this adit flow channel. Precipitate buildup behind the adit grate has raised the level with which water flows out of the adit. Staining on the grate indicates that higher flows have been present historically. Discharged adit water flows over waste rock at the site, and the onsite waste rock is being undercut by the South Fork of Cement Creek with a high degree of erosion. **Figure 4-5** shows sample locations and features of this mining-related source.

The following sections describe results of analyses conducted for the Natalie/Occidental Mine surface water, SPLP, soils, waste rock, and sediments, as provided in **Tables 4-1 through 4-5**.

#### 4.6.1.1 Natalie/Occidental Mine Adit Discharge and Surface Water

In 2015 and 2016, three total water quality sampling locations were collected for the Natalie/Occidental Mine (**Table 4-1**). Samples were collected from an adit location (CC14), upstream of Natalie/Occidental Mine in the South Fork of Cement Creek (CC15), and downstream of Natalie Occidental Mine in the South Fork of Cement Creek (CC15A) (**Figure 4-5**).

In September 2016, the adit flow rate was measured at CC14 at 407 gpm, with a pH value of 5.39 su. The remaining 2015 and 2016 adit pH values ranged from 6.09 to 6.32 su. Upstream of Natalie/Occidental in the South Fork of Cement Creek at CC15, flows were measured at 7,277 and 301 gpm in June and September 2016, respectively, with no pH measurement in June and a pH value of 7 su in September. Downstream of the Natalie/Occidental Mine in the South Fork of Cement Creek at CC15A, flows were measured as 7,206 and 1,170 gpm in June and September 2016, respectively, with a pH value of 6.8 su in September and no pH measurement in June. These results indicate that the Natalie/Occidental Mine significantly contributes to flow to the South Fork of Cement Creek during September low-flow conditions.

In 2015 and 2016, the Natalie/Occidental Mine adit discharge exceeded acute standards for Zn, and chronic standards for Al, Cd, and Fe. Additionally, the June 2015 and 2016 samples exceeded acute standards for Cu. Upstream samples from 2016 only exceeded the chronic standards for Al. Downstream of the Natalie/Occidental Mine, the June 2016 sample exceeded the acute standard for Zn and chronic standards for Al, Cd, Cu, and Fe, while the September 2016 sample exceeded the chronic standards for Al, Cd, Fe, and Zn. These water quality results indicate that the Natalie/Occidental Mine increases concentrations of Fe, Mn, and Zn in the South Fork of Cement Creek.

#### 4.6.1.2 Natalie/Occidental Mine CDMG and EPA/ESAT Waste Rock SPLP

One leachate sample was collected by CDMG from waste rock at the Natalie/Occidental Mine (**Table 4-2**). This waste rock sample exceeded the acute standard for Al, Cd, Cu, Pb, and Zn, and the chronic standard for Fe. CDMG and USGS estimated 6,800 cy of waste rock material onsite.

Per **Table 4-3**, two SPLP samples were analyzed from waste rock samples collected in July 2016 at the Natalie/Occidental Mine (WR-CC14A and WR-CC14B). These samples exceeded the acute standards for Al and Pb, and chronic standards for Fe. The WR-CC14B sample also exceeded the acute Zn standard.

#### 4.6.1.3 Natalie/Occidental Mine Soils, Waste Rock, and Sediment

Per **Table 4-4**, samples were collected from the Natalie/Occidental Mine at two waste rock pile locations (WR-CC14A and WR-CC14B), upstream of the mine in the South Fork of Cement Creek (CC15), and downstream of the mine in the South Fork of Cement Creek (CC15A).

Per **Table 4-5**, sediment samples were collected in 2016 at two locations (upstream and downstream in South Fork of Cement Creek) at the Natalie/Occidental Mine. Metals concentrations were typically higher downstream of the mine and exceeded sediment screening levels for As, Cu, and Pb in all samples.

## 4.7 Sampling Results at Mining-Related Sources – Lower Cement Creek

### 4.7.1 Henrietta Mine

The Henrietta Mine is located on the south side of Prospect Gulch and is accessible by 4-wheel drive vehicle from County Road 35, with at least six levels into the mine. The 700 Level entrance to the mine is at an elevation of 11,360 feet NGVD29. The 800 Level is collapsed and topographically below and north of the 700 Level portal, close to Prospect Gulch. CDMG reported a large compound waste dump located at the adit portals of the 700 and 800 levels, which is divided by Prospect Gulch and is mostly located on the south side of Prospect Gulch below the 700 Level. CDMG estimated from a survey that 30,000 cy of waste are onsite from the 700 and 800 levels, while USGS estimated approximately 36,000 cy. This 700- and 800-level waste rock pile has since been reclaimed. Presently, the 700 Level adit flows only during high-flow conditions and is diverted into a drainage channel that flows on the southeastern side of the waste rock. There is a small cabin located near the 700 Level adit. A grate is in place on the 700 Level portal and the surrounding slope is eroding. Additional orange precipitate is present in Prospect Gulch downstream of a wooden dam near the 800 Level adit. **Figure 4-6** shows relevant features of this mining-related source.

The following sections describe results of analyses conducted for the Henrietta Mine surface water, SPLP, soils, waste rock, and sediments, as provided in **Tables 4-1 through 4-5**.

#### 4.7.1.1 Henrietta Mine Adit Discharge and Surface Water

In 2016, three total water quality sampling locations were collected for the Henrietta Mine (**Table 4-1**). Samples were collected from the 700 Level adit location (CC24G), upstream of

Henrietta Mine in Prospect Gulch (CC22D), a midpoint in Prospect Gulch (CC22B), and downstream of Henrietta Mine in Prospect Gulch (CC24B) (**Figure 4-6**).

Flows were measured from the Prospect Gulch upstream (CC22D), midpoint (CC22B), and downstream (CC24B) locations in September 2016 as 73, 131, and 166 gpm, respectively, with pH values of 5.79, 4.33, and 3.93 su, respectively. pH values were similar between June and September at the upstream location but dropped at the midpoint and downstream location between high- and low-flow conditions. These flow and pH results indicate that the northern and southern waste rock seeps and 800 Level adit are impacting Prospect Gulch flow and pH during both high- and low-flow conditions. At the 700-level adit (CC24G), flows were not measured in 2016, and pH was 4.61 in June 2016.

The June 2016 Henrietta Mine 700-level adit water sample exceeded acute standards for Al, Cu, and Zn, and chronic standards for Cd, Fe, and Pb. The 2016 upstream and midpoint samples exceeded the acute standards for Al, Cd, Cu, Pb, and Zn. The downstream June sample exceeded acute standards for Cu and Zn and chronic standards for Al, Cd, Fe, and Pb, while the downstream September sample exceeded acute standards for Al, Cd, Cu, Pb, and Zn and the chronic standard for Fe. Concentrations of Al and Pb increased between the upstream and midpoint samples during both high- and low-flow samples, and concentrations typically increased between the upstream and downstream sampling points.

#### **4.7.1.2 Henrietta Mine CDMG and EPA/ESAT Waste Rock SPLP**

Three leachate samples were collected by CDMG from waste rock at the Henrietta Mine (**Table 4-2**). These samples exceeded the acute standards for Al, Cd, Cu, Pb, and Zn, and the chronic standard for Fe. CDMG and USGS estimated 30,000 cy of waste rock material onsite.

Per **Table 4-3**, one SPLP test was conducted on a waste rock sample collected in July 2016 at the toe of the Henrietta Mine waste rock pile (WR-CC22). This sample exceeded the acute standard for Pb and chronic standards for Al and Fe.

#### **4.7.1.3 Henrietta Mine Soils, Waste Rock, and Sediment**

Per **Table 4-4**, samples were collected from the Henrietta Mine in July 2016 at one waste rock location (WR-CC22), and in September 2016 at one upstream soil location in Prospect Gulch (CC22D), one midpoint location in Prospect Gulch (CC22B), and one downstream soil location in Prospect Gulch (CC24B).

Per **Table 4-5**, sediment samples were collected in September 2016 at three locations at the Henrietta Mine. Metals concentrations exceeded sediment screening levels for As, Cd, Cu, Pb, and Zn. Except for Al, metals concentrations typically decreased in Prospect Gulch between the upstream and downstream samples.

### **4.7.2 Mammoth Tunnel**

The Mammoth Tunnel is located on the west side of Cement Creek near the mouth of Georgia Gulch at an elevation of 10,400 feet NGVD29. This mining-related source is located on a county road and is accessible to the public. The USGS estimated the waste rock pile at 100 cy. The adit is collapsed and a pipe protrudes from the side of the hill to allow discharge. The adit flow is channelized and flows down the side of the waste rock in a lined channel into two constructed settling ponds. Some

of the discharged flow bypasses the first pond into the second pond. Adit discharge does not flow out of second pond, but instead seeps into the ground. Algae and Fe staining and metal precipitates are found throughout the discharge channel and ponds. **Figure 4-7** shows relevant features of this mining-related source.

Due to property access limitations, analytical samples were not collected by EPA/ESAT for any media during their 2015/2016 sampling events. Thus, limited historic information from the USGS and CDMG are provided. According to the leachability test performed by CDMG on waste rock from the Mammoth Tunnel, the leachate exceeded the water quality screening criteria for acute Al, Cd, Cu, and Zn (**Table 4-2**).

### 4.7.3 Anglo Saxon Mine

The Anglo Saxon Mine is adjacent to County Road 110 on the west side of Cement Creek, approximately 3 miles upstream from Silverton. The site is accessible to the public. This mine consists of an adit located close to County Road 110. The adit is at an elevation of 10,080 feet NGVD29 and the adit discharge flows from a collapsed wooden structure. The main adit discharges across a moderately eroded waste pile, and cascades down to a culvert underneath the road to a constructed settling pond before continuing to Cement Creek. Orange precipitate staining is observed on the flow channels draining from this primary adit. A wooden shack and a crib wall are present at the site. **Figure 4-8** shows sample locations and features of this mining-related source.

The following sections describe results of analyses conducted for the Anglo Saxon Mine surface water, SPLP, soils, waste rock, and sediments, as provided in **Tables 4-1 through 4-5**.

#### 4.7.3.1 Anglo Saxon Mine Adit Discharge and Surface Water

In 2016, six total water quality sampling locations were collected for the Anglo Saxon Mine and Porcupine adit area (**Table 4-1**). Samples were collected from the lower (main) adit location (CC37), upstream of Anglo Saxon Mine in Cement Creek (CC39B), downstream of Anglo Saxon Mine in Cement Creek (CC39), Porcupine Gulch adit (upper adit) (CC38B), upstream of upper adit in Porcupine Gulch (CC38C), and downstream of the upper adit before confluence with Cement Creek (CC38) (**Figure 4-8**).

Flows were measured from the lower main adit (CC37) in June and September 2016 to be 41 gpm during both events, with a pH of 6.53 su during both events. At the upper adit (CC38B) in June and September, flows were 59 and 36 gpm, respectively, with pH values of 6.15 and 6.67 su, respectively. Upstream (CC38C) and downstream (CC38) of the upper adit in September, flows in Porcupine Gulch were 15 and 37 gpm, respectively, and pH was 7.32 and 7.25 su, respectively. Upstream of the Anglo Saxon Mine in Cement Creek (CC39B), flow was 6,993 gpm in September (no flow measured in June), and pH in June and September was 5.1 and 3.82 su, respectively. Downstream of Anglo Saxon Mine in Cement Creek (CC39), flow was 7,970 gpm in September (no flow measured in June), and pH in June and September was 5.26 and 3.62 su, respectively. These results indicate that the Porcupine Gulch adit contributes significantly to flow in Porcupine Gulch during low-flow, and the effect of seasonal flows reduces Cement Creek pH at this point by approximately 1.5 su between June and September, though the pH is relatively unchanged across the site.



The 2016 Anglo Saxon Mine main adit and Porcupine Gulch adit water samples all exceeded acute standards for Mn and Zn, and chronic standards for Al, Cd, and Fe. The June 2016 sample from the Porcupine Gulch adit also exceeded the acute standard for Cu. These metals concentrations do not appear to change meaningfully between June to September. Upstream and downstream locations in Cement Creek both exceeded acute standards for Cu and Zn, and chronic standards for Al, Cd, Fe, and Pb.

#### 4.7.3.2 Anglo Saxon Mine CDMG and EPA/ESAT Waste Rock SPLP

One leachate sample was collected by CDMG from waste rock at the Anglo Saxon Mine (**Table 4-2**). This sample exceeded the acute standards for Al, Cd, Cu, Pb, and Zn, and the chronic standard for Fe. CDMG and USGS estimated there was 2,200 cy of waste rock material onsite.

Per **Table 4-3**, four SPLP tests were conducted on two waste rock samples collected in July 2016 at the Anglo Saxon Mine and the Porcupine Gulch adit (WR-CC37 and WR-CC38B). These SPLP tests were performed on waste rock passing a 10- and 60-sieve. The WR-CC37 10-sieve sample exceeded acute standards for Pb and Zn, and chronic standard for Mn, while the 60-sieve portion also exceeded the acute standards for Al, Cu, and Mn, and chronic standard for Fe. The 60-sieve portion of this sample contained the highest Fe and Mn concentrations among the Cement Creek mining-related sources. For the WR-CC38B 10- and 60-sieve samples, acute standards were exceeded for Al, Cd, Cu, Pb, and Zn, and chronic standard for Fe.

#### 4.7.3.3 Anglo Saxon Mine Soils, Waste Rock, and Sediment

Per **Table 4-4**, samples were collected from the Anglo Saxon Mine and Porcupine Gulch adit in 2016 at two waste rock pile locations (WR-CC37 and WR-CC38B), three locations in Porcupine Gulch before confluence with Cement Creek (CC38, CC38C, and CC38D), upstream of the mine in Cement Creek (CC39B), and downstream of the mine in Cement Creek (CC39).

Per **Table 4-5**, sediment samples were collected in 2016 at five locations at the Anglo Saxon Mine. The upstream CC39B location exceeded sediment screening levels for As, Cd, Cu, Pb, Mn, and Zn, while the downstream location only exceeded sediment screening levels for As, Cu, Pb, and Zn. The three sampling locations in Porcupine Gulch all exceeded sediment screening levels for As, Cd, Cu, Pb, Mn, and Zn, and the CC38 location also exceeded the sediment screening level for Fe. Metals concentrations did not typically increase in Cement Creek between the mine upstream and downstream samples.

#### 4.7.4 Yukon Tunnel

The Yukon Tunnel lies on the east side of Cement Creek along County Road 110 about 2.5 miles upstream from Silverton. Access is via an old bridge across Cement Creek at an elevation of 10,080 feet NGVD29. The site access road is gated but still accessible by walking. The adit has a metal door and the closure is in generally poor condition. Adit discharge is directed within the adit into a pipe, which discharges to the north of a large waste rock pile into Illinois Gulch adjacent to the mine. There is a moderate amount of erosion on the waste rock pile, and four structures are onsite. **Figure 4-9** shows sample locations and features of this mining-related source.

The following sections describe results of analyses conducted for the Yukon Tunnel surface water, SPLP, soils, waste rock, and sediments, as provided in **Tables 4-1 through 4-5**.

#### 4.7.4.1 Yukon Tunnel Adit Discharge and Surface Water

In 2016, four total water quality sampling locations were collected for the Yukon Tunnel (Table 4-1). Samples were collected from the adit discharge pipe (CC43C), upstream in Cement Creek (CC41), downstream in Cement Creek (CC43E), and from an onsite pond where previous reclamation activities had occurred (CC43D) (**Figure 4-9**).

In September 2016, flows were measured at the upstream (CC41) and downstream (CC43E) points in Cement Creek as 6,939 and 7,069 gpm, respectively, with pH values of 3.55 and 3.88 su, respectively. In June, the upstream and downstream locations in Cement Creek had pH values of 5.16 and 5.37 su, respectively. These results indicate pH effects from seasonal flows in Cement Creek. The pond location (CC43D) pH was 2.98 su in June. The pH at the pipe outlet from the Yukon Tunnel adit (CC43C) in June and September 2016 was 6.82 and 6.68 su, respectively, and flow was not measured.

In 2016, the adit discharge pipe (CC43C) exceeded chronic standards Al and Fe, while the onsite reclaimed pond sample in June 2016 (CC43D) exceeded acute standards for Al, Cd, Cu, Mn, and Zn, and chronic standards for Fe. The metals concentrations in the reclaimed pond were typically orders of magnitude above those from the adit location. In Cement Creek upstream (CC41) and downstream (CC43E) of Yukon Tunnel in June, acute standards were exceeded for Cd, Cu, and Zn, and chronic standards for Al, Fe, and Pb. In September, the upstream and downstream locations exceeded acute standards for Cu and Zn, and chronic standards for Al, Cd, Fe, and Pb. From **Table 4-1**, these results indicate that in June 2016, metals concentrations increased across the Yukon Tunnel site, while in September 2016 metals concentrations decreased across the site.

#### 4.7.4.2 Yukon Tunnel CDMG and EPA/ESAT Waste Rock SPLP

One leachate sample was collected by CDMG from waste rock at the Yukon Tunnel (**Table 4-2**). This sample exceeded the acute standards for Al, Cd, Cu, Pb, and Zn. CDMG and USGS estimated 18,000 cy of waste rock material onsite.

Per **Table 4-3**, one SPLP sample was analyzed from waste rock samples collected in July 2016 at the Yukon Tunnel (WR-CC43). This sample exceeded the acute standards for Al, Cd, Cu, Pb, and Zn, and chronic standard for Fe. This sample had the highest waste rock SPLP Al concentration of any sample among the Cement Creek mining-related sources.

#### 4.7.4.3 Yukon Tunnel Soils, Waste Rock, and Sediment

Per **Table 4-4**, samples were collected from the Yukon Tunnel in 2016 at one waste rock pile location (WR-CC43), an onsite pond location (CC43D), in Illinois Gulch before confluence with Cement Creek (CC42), upstream of the mine in Cement Creek (CC41), and downstream of the mine in Cement Creek (CC43E).

Per **Table 4-5**, sediment samples were collected in 2016 at four locations at the Yukon Tunnel. At the Cement Creek upstream and downstream locations, metals concentrations exceeded sediment screening levels for As, Pb, and Zn, while the downstream location also exceeded sediment screening levels for Cd and Cu. The two samples collected from Illinois Gulch exceeded sediment

screening levels for As, Cu, Pb, Mn, and Zn, and the CC42 sample also exceeded sediment screening levels for Cd. Additionally, Mn sediment concentrations were elevated at the mouth of Illinois Gulch compared to Cement Creek.

## 4.8 Sampling Results at Mining-Related Sources – Burrows Creek

### 4.8.1 Boston Mine

The Boston Mine is located on the north side of Burrows Creek (a tributary to the upper Animas River), along the northwest side of Houghton Mountain above the trans-basin diversion ditch at an elevation of 12,088 feet NGVD29. This mining-related source is between the Red Cloud and Dewitt Mines, and is accessible to the public off County Road 18. This location consists of a 900-cy waste rock pile and tunnel. There is no visible flow from the tunnel. A polyvinyl chloride pipe coming out of the concrete cover was not discharging during the site visit in fall 2016. Burrows Creek flows adjacent to the waste rock in a channel, and there is evidence of waste rock and soil eroding and sloughing off into the channel. There are no structures onsite. **Figure 4-10** shows sample locations and features of this mining-related source.

The following sections describe results of analyses conducted for Boston Mine surface water, SPLP, soils, waste rock, and sediments, as provided in **Tables 4-1 through 4-5**.

#### 4.8.1.1 Boston Mine Surface Water

In 2016, three total water quality sampling locations were collected from the Boston Mine (Table 4-1). Samples were collected at an upstream location above the mine (A07E), the trans-basin diversion ditch above the confluence with Burrows Creek (A07D1), the trans-basin diversion ditch below Burrows Creek (A07D2), and a downstream location in Burrows Creek just before the Dewitt Mine (A07D). No locations represent an adit discharge but demonstrate the change in water quality from water flowing through the Boston Mine site (**Figure 4-10**).

In October 2016, the flow at the upstream (A07E) and downstream (A07D) points was reported to be 49 and 9 gpm, respectively. In the trans-basin ditch upstream of the site (A07D1), flow was 55 gpm in June. No other flow rate measurements were available. The upstream June and October samples had pH values of 4.18 and 3.86 su, respectively, and the downstream June and October samples had pH values of 4.23 and 4.11 su, respectively. At all sampling locations, the June and October samples exceeded the acute standards for Al, Cd, Cu, Mn, and Zn, and the chronic standard for Pb. In the trans-basin diversion sample upstream of the site, the pH was 4.26 su and the sample had the highest Al, Cd, Mn, and Zn at the Boston Mine. At the upstream and downstream locations in Burrows Gulch, concentrations were typically higher in October than in June and concentrations increased between upstream and downstream points.

#### 4.8.1.2 Boston Mine Leachate

One leachate sample was collected by CDMG from waste rock at the Boston Mine from the lower shaft (**Table 4-2**). This sample exceeded the acute standard for Cd, Cu, Pb, and Zn, and the chronic standard for Al. CDMG and USGS estimated 900 cy of waste rock material onsite. Per **Table 4-3**, one SPLP sample was analyzed from waste rock samples collected in July 2016 at the Boston Mine (WR-BSN). This sample exceeded the acute standards for Cd, Pb, and Zn.



#### 4.8.1.3 Boston Mine Soils, Waste Rock, and Sediment

**Table 4-4** presents 2016 waste rock sample results for the Boston Mine. Samples were collected at a waste rock location (WR-BSN), upstream of the Mine in Burrow Gulch (A07E), and downstream of the mine (A07D).

Per **Table 4-5**, sediment samples were collected in 2016 at two locations at the Boston Mine in Burrows Creek. With the exception of Al, metals concentrations increased upstream to downstream. Metals concentrations exceeded sediment screening levels for As, Cd, Cu, Pb, Mn, and Zn in both samples.

#### 4.8.2 London Mine

The London Mine is located on the north side of Burrows Creek along the north side of Houghton Mountain at an elevation of 11,976 feet NGVD29. This mining-related source is directly off County Road 18 and is easily accessible to the public. There are two adits: one has a 3-foot by 3-foot grate and the other is collapsed. Flow is observed from each adit and seeps are present around the base of two large waste rock piles. CDMG and USGS estimated 3,300 cy of waste rock at this location. Orange precipitates are present in adit flow, and vegetation is stressed. **Figure 4-11** shows sample locations and other features of this mining-related source.

The following sections describe results of analyses conducted for London Mine surface water, SPLP, soils, waste rock, and sediments, as provided in **Tables 4-1 through 4-5**.

##### 4.8.2.1 London Mine Surface Water

In 2015 and 2016, four total water quality sampling locations were collected from the London Mine (**Table 4-1**). Samples were collected at the west adit (DM6), the east adit (DM7), an upstream location in Burrows Creek (A07B1), and a downstream location in Burrows Creek (A07B) (**Figure 4-11**). Location A07B was the only location sampled in 2015 in September.

Flow rates were measured at the two adit locations in June 2016. The west adit (DM6) had a higher flow rate of 3.2 gpm compared to the east adit (DM7) at 1.1 gpm. Discharge at the west adit dropped to 0.7 gpm during the September 2016 event; the east adit flow rate was not measured. The west adit pH dropped from 6.13 to 3.21 su in 2016, and the east adit pH was 6.69 and 6.41 su in June and September 2016, respectively. In June 2016, the upstream location in Burrows Creek (A07B1) had a flow rate of 1329 gpm and a pH of 4.28 su, and the downstream location (A07B) had a flow rate of 1206 gpm and a pH of 4.32 su. During low-flow conditions in September 2015, the downstream location in Burrows Creek had a flow rate of 21 gpm and a pH of 4.3, and in September 2016 had a flow rate of 186 gpm and a pH of 4.08 su.

In June 2016, the west adit sample exceeded acute standards for Cd, Cu, Pb, and Zn, and the chronic standard for Al. Metals concentrations in the west adit September 2016 sample had a nearly 10-fold increase over the June 2016 sample. The east adit samples exceeded acute standards for Cd and Zn, and chronic standards for Al and Fe. Upstream and downstream samples in Burrows Creek exceeded acute standards for Al, Cd, Cu, Mn, and Zn, and chronic standards for Pb.

#### 4.8.2.2 London Mine Leachate

One leachate sample was collected by CDMG from waste rock at the London Mine (**Table 4-2**). This sample exceeded the acute standards for Cd, Cu, Pb, and Zn, and the chronic standard for Al. CDMG and USGS estimated 3,300 cy of waste rock material onsite.

Per **Table 4-3**, three SPLP samples were analyzed from waste rock samples collected in August 2015 and July 2016 at the London Mine (WR1-LND, WR2-LND, and AE18). The samples all exceeded the acute standards for Cd, Cu, Pb, and Zn. The WR1-LND and AE18 samples also exceeded the chronic standards for Al.

#### 4.8.2.3 London Mine Soils, Waste Rock, and Sediment

**Table 4-4** presents 2015 and 2016 waste rock sample results from the London Mine. Samples were collected from three waste rock locations (WR1-LND, WR2-LND, and AE18), and soil downstream of the mine in Burrows Creek (A07B). The sample collected downstream of London Mine had the highest Al concentration in waste rock and soil samples collected at the Site.

Per **Table 4-5**, a total of three sediment samples were collected in 2015 and 2016 at location A07B, downstream of the London Mine in Burrows Creek. Metals concentrations exceeded sediment screening levels for As, Cd, Cu, Pb, Mn, and Zn in all samples.

### 4.8.3 Ben Butler Mine

Ben Butler Mine is located on the north side of Burrows Creek on the south slope of Denver Hill at an elevation of 12,200 feet NGVD29, approximately 1,200 feet north of the London Mine. The mine is off County Road 18, but there are no direct roads to the site and it is not readily accessible to the public. There are two shafts and three stopes at the site, which are all filled with water. CDMG estimates 500 cy of waste rock at this location. There are scattered metal and wood debris onsite, but no structures. A 200-yard-long vegetation kill zone extends downslope from the waste dump towards Burrows Creek. **Figure 4-12** shows sample locations and other features of this mining-related source.

The following sections describe results of analyses conducted for Ben Butler Mine surface water, SPLP, soils, waste rock, and sediments, as provided in **Tables 4-1 through 4-5**.

#### 4.8.3.1 Ben Butler Mine Adit Discharge and Surface Water

In June 2016, one water quality sample was collected for the Ben Butler Mine (**Table 4-1**) at the shaft location (BB1) (**Figure 4-12**). Flow was not measured, pH was 3.97 su, and acute standards were exceeded for Al, Cd, Cu, Pb, and Zn.

#### 4.8.3.2 Ben Butler Mine CDMG and EPA/ESAT Waste Rock SPLP

One leachate sample was collected by CDMG from waste rock at the Ben Butler Mine (**Table 4-2**). This sample exceeded the acute standards for Al, Cd, Cu, Pb, and Zn, and the chronic standard for Fe. CDMG and USGS estimated 500 cy of waste rock material onsite. Of the CDMG samples, the waste rock at Ben Butler had the highest concentrations of Al, Cd, Fe, and Zn samples among the Animas River mining-related sources.

Per **Table 4-3**, one SPLP sample was analyzed from waste rock samples collected in July 2016 at the Ben Butler Mine (WR-BB). This sample exceeded the acute standards for Cd, Cu, Pb, and Zn, and chronic standard for Fe. The concentrations of Pb and Zn in this waste rock SPLP sample were among the highest for Animas River mining-related sources.

#### 4.8.3.3 Ben Butler Mine Soils, Waste Rock, and Sediment

**Table 4-4** presents 2016 waste rock sample results from the Ben Butler Mine. Samples were collected from a waste rock location (WR-BB), and soil downstream of the mine in a drainage channel (BB2).

Per **Table 4-5**, a sediment sample was collected in 2016 at location BB2 at the Ben Butler Mine below the waste rock pile. Metals concentrations exceeded sediment screening levels for As, Cd, Cu, Pb, Mn, and Zn in the sample.

## 4.9 Sampling Results at Mining-Related Sources – Animas River Headwaters

### 4.9.1 Mountain Queen Mine

The Mountain Queen Mine is located on the east side of Hurricane Peak at the headwaters of California Gulch, with a shaft near the top of California Pass at an elevation of 12,790 feet NGVD29 and a draining adit east of the shaft at an elevation of 12,375 feet NGVD29. There are three shafts: a collapsed shaft, a shaft/vent, and an upper shaft drill pad with a drill rod sticking out of ground. The waste rock pile at the upper shaft is situated adjacent to the 4-wheel drive road over California Pass and CDMG estimates 1,900 cy of material at this location. CDMG estimates the waste rock pile located at the lower adit has approximately 3,200 cy of material, and snow commonly drifts around the rock pile. There are moderate degrees of erosion on both waste rock piles. The mine is directly off the road and is accessible to the public. The lower adit opening is covered with a grate and rock fall occurred recently above the grate. The adit discharge flows around both sides of the waste rock pile and into California Gulch. **Figure 4-13** shows sample locations and other features of this mining-related source.

The following sections describe results of analyses conducted for Mountain Queen Mine surface water, SPLP, soils, waste rock, and sediments, as provided in **Tables 4-1 through 4-5**.

#### 4.9.1.1 Mountain Queen Mine Adit Discharge and Surface Water

In 2015 and 2016, two total water quality sampling locations were collected for the Mountain Queen Mine (**Table 4-1**). Samples were collected from the lower adit location (A19A), and downstream of the mine in California Gulch (A18) (**Figure 4-13**).

In September 2015 and September 2016, flows were measured at the adit (A19A) to be 0.8 and 2.7 gpm, respectively. pH at the adit was 3.70 su in September 2015, and pH was not reported in September 2016. In October 2016, downstream flow at A18 was not measured, and pH was 7.30 su.

At the adit location in September 2015 and September 2016, acute standards were exceeded for Al, Cd, Cu, Mn, Pb, and Zn, and chronic standards were exceeded for Fe. Downstream, the chronic standards were exceeded for Al, Cd, and Cu.

#### 4.9.1.2 Mountain Queen Mine CDMG and EPA/ESAT Waste Rock SPLP

Two leachate samples were collected by CDMG from waste rock at the Mountain Queen Mine at the upper shaft and lower adit locations (**Table 4-2**). These samples exceeded the acute standards for Cd, Cu, Pb, and Zn, and the chronic standard for Al. The upper shaft also exceeded the chronic standard for Fe. CDMG and USGS estimated 5,100 and 1,900 cy of waste rock material onsite, respectively, for the upper and lower locations.

Per **Table 4-3**, two SPLP samples were analyzed from waste rock samples collected in August 2015 at the Mountain Queen Mine (AE1 and AE2). These samples both exceeded the acute standards for Cu, Pb, and Zn, and chronic standard for Al. The AE1 sample also exceeded the acute standard for Cd. The AE1 upper-shaft waste rock SPLP location had the highest Pb concentration among Animas River mining-related sources.

#### 4.9.1.3 Mountain Queen Mine Soils, Waste Rock, and Sediment

**Table 4-4** presents 2015 waste rock sample results from the Mountain Queen Mine. Samples were collected from an upper shaft location (AE1) and adit downstream (AE2).

Per **Table 4-5**, sediment samples were collected in 2015 at two locations at the Mountain Queen Mine in upper California Gulch. Metals concentrations exceeded sediment screening levels for As, Cu, Pb, Mn, and Zn in both samples, and Cd in the downstream sample.

### 4.9.2 Vermillion Mine

The Vermillion Mine is located in a large gentle swale high on the north side of California Gulch near the southwestern flank of Houghton Mountain at an elevation of 12,440 feet NGVD29. The site requires hiking to access and has limited accessibility to the public. There is one draining adit at the Vermillion Mine site. The adit discharge flows south over soil before infiltrating into the waste rock pile. The drainage continues to flow approximately 2,000 feet south and southeast where it enters the West Fork Animas River. CDMG and USGS estimated 5,100 cy of waste rock at this location. **Figure 4-14** shows sample locations and other features of this mining-related source.

The following sections describe results of analyses conducted for Vermillion Mine surface water, SPLP, soils, waste rock, and sediments, as provided in **Tables 4-1 through 4-5**.

#### 4.9.2.1 Vermillion Mine Adit Discharge and Surface Water

In 2015 and 2016, four total water quality sampling locations were collected for the Vermillion Mine (**Table 4-1**). Samples were collected from a drainage channel downstream of the upper adit (CG5), upstream of the mine in California Gulch (CG4), downstream of the mine in California Gulch (CG6), and further downstream in California Gulch (CG6A) (**Figure 4-14**).

In 2016, the adit drainage channel (CG5) flow was not measured; pH was 5.48 su. Upstream of the mine (CG4), the flow rate was 247 gpm in September 2015, 6,127 gpm in June 2016, and 1,006 gpm in October 2016. The pH at this point ranged from 5.01 to 6.58 at these times, with lower pH values observed during low-flow in September and October. Downstream of the mine at CG6, the flow rate was 189 gpm in September 2015, 7,803 gpm in June 2016, and 785 gpm in September 2016. The pH ranged from 4.97 to 6.46 su at these times, and as with the upstream location, lower

flows had lower pH values. The farther downstream sampling location (CG6A) had a flow of 5,679 gpm and a pH of 6.57 su in June 2016.

At all sampling locations, acute standards were exceeded for Al, Cd, Cu, and Zn. Acute standards for Mn were also exceeded during most events. Metals concentrations were typically lower between the upstream and downstream locations.

#### 4.9.2.2 Vermillion Mine CDMG and EPA/ESAT Waste Rock SPLP

One leachate sample was collected by CDMG from waste rock at the Vermillion Mine (**Table 4-2**). This sample exceeded the acute standards for Al, Cd, Cu, Pb, and Zn, and the chronic standards for Fe and Mn. CDMG and USGS estimated 5,100 cy of waste rock material onsite.

Per **Table 4-3**, one SPLP sample was analyzed from waste rock samples collected in July 2016 at the Vermillion Mine near the adit (AE9A). This sample exceeded the acute standards for Cu, Pb, and Zn, and chronic standards for Al and Fe.

#### 4.9.2.3 Vermillion Mine Soils, Waste Rock, and Sediment

**Table 4-4** presents 2016 waste rock sample results from the Vermillion Mine. Samples were collected from a waste rock location (AE9A) and downstream of the mine in California Gulch (CG6).

Per **Table 4-5**, sediment samples were collected in 2015 and 2016 at two locations at the Vermillion Mine. Metals concentrations exceeded sediment screening levels for As, Cu, Pb, Mn, and Zn in all samples, and exceeded sediment screening levels for Cd in all samples except for September 2016.

### 4.9.3 Sunbank Group Mine

The Sunbank Group Mine is located directly east of the road in Placer Gulch and is accessible to the public. The adit is sealed with a concrete block; however, flow is coming out of the top of the concrete block and from seeps upgradient of the adit block. Adit discharge is directed into a series of settling ponds immediately adjacent to Placer Gulch. The ponds appear to no longer be functional and adit drainage no longer flows sequentially through the ponds prior to discharging into Placer Gulch. Fe precipitate is present in the drainage. Waste rock has been regraded along the slope and partially vegetated, but the volume was not estimated. There are no onsite structures. **Figure 4-15** shows sample locations and features of this mining-related source.

The following sections describe results of analyses conducted for Sunbank Group Mine surface water, SPLP, soils, waste rock, and sediments, as provided in **Tables 4-1 through 4-5**.

#### 4.9.3.1 Sunbank Group Mine Surface Water

In 2015 and 2016, three total water quality sampling locations were collected for the Sunbank Mine Group (**Table 4-1**). Samples were collected from the adit discharge location (A21A), upstream of the mine in Placer Gulch (A22), and downstream of the mine (A21) (**Figure 4-15**).

At the adit location (A21A), flow was measured in September 2015 at 16.4 gpm and the pH was 4.79 su. No flows were recorded with the 2016 adit samples; pH was 5.51 and 3.78 in June and September 2016, respectively. Upstream of the mine (A22), the flow was 3,576 gpm in June 2016,

and 61 and 531 gpm in September 2015 and 2016, respectively. pH values at these times ranged from 5.97 to 6.99 su with lower pH values occurring during low-flow conditions. Downstream of the mine in Placer Gulch (A21), the flow was 4,916 gpm in June 2016, and 76 and 515 gpm in September 2015 and 2016, respectively. pH values at these times ranged from 5.54 to 6.94 su, with lower pH values occurring during low-flow conditions. A pH decrease across the Sunbank Group Mine was observed during fall low-flow conditions, but that effect is not apparent during spring high-flow conditions.

At the adit in 2015 and 2016, all water samples exceeded the acute standards for Al, Cd, Mn, Pb, and Zn, and the chronic standard for Fe. The June 2016 upstream sample also exceeded acute standards for Cd, Cu, and Mn, and the upstream September 2015 and 2016 samples also exceeded the chronic standard for Cd. 2015 and 2016 downstream samples exceeded the acute standards for Cd and Zn and the chronic standards for Al and Pb. The June 2016 downstream sample also exceeded the acute standards for Cu and Mn, and the downstream September samples also had exceedances of the chronic standards for Cu, Fe, and Mn. Comparing metals results between upstream and downstream locations suggests that there is an increase in Fe, Pb, and Zn concentrations in Placer Gulch due to the Sunbank Mine Group.

#### 4.9.3.2 Sunbank Group Mine Leachate

No waste rock samples were collected at the Sunbank Group Mine during the CDMG investigation. However, three SPLP samples were analyzed from waste rock samples collected in August 2015 at locations AE44, AE45, and AE46 (**Table 4-3**). Leachate concentrations exceeded the acute standards for Cd, Cu, Pb, and Zn at all three locations. Additionally, at AE45 and AE46, the acute standards were exceeded for Al and Mn. At the AE45 location, waste rock SPLP concentrations of Al and Mn were among the highest of waste rock samples for the Animas River mining-related sources.

#### 4.9.3.3 Sunbank Group Mine Soils, Waste Rock, and Sediment

**Table 4-4** presents 2015 and 2016 soil and waste rock sample results for the Sunbank Group Mine. Samples were collected from three adit locations (AE44, AE45, and AE46), an upstream location in Placer Gulch (A22), and downstream location in Placer Gulch (A21).

Per **Table 4-5**, sediment samples were collected in 2015 and 2016 at two locations at the Sunbank Mine Group in Placer Gulch. Metals concentrations exceeded sediment screening levels for As, Cd, Cu, Pb, Mn, Hg, and Zn in all samples. Concentrations of Hg were significantly higher than sediments from all other mining-related sources, and concentrations of Pb and Zn noticeably increased between the upstream and downstream locations.

#### 4.9.4 Frisco/Bagley Tunnel

The Frisco/Bagley Tunnel is located approximately 0.5 miles west of Animas Forks on the north side of California Gulch. The site is located at an elevation of 11,440 feet NGVD29. A 4-wheel drive access road (County Road 9) passes through the mine area and splits a large waste rock pile in two, making it accessible to the public. CDMG and USGS estimated these two waste rock piles at 41,000 cy and 20,500 cy, respectively. A rock and mortar closure with a grate is installed at the adit portal located on top of the waste rock pile on the north side of the road. The adit discharge is channelized southwest across a waste rock pile and red staining is highly visible throughout the



channels, which flow into California Gulch. Vegetation kill is apparent at the site and within the adit flow channel. Additional adit flow ponds on top of the waste rock pile. Water seeps out base of waste rock pile, and the waste rock pile is being undercut by California Gulch. There is a mill structure onsite. **Figure 4-16** shows sample locations and features of this mining-related source.

The following sections describe results of analyses conducted for the Frisco/Bagley Tunnel surface water, SPLP, soils, waste rock, and sediments, as provided in **Tables 4-1 through 4-5**.

#### 4.9.4.1 Frisco/Bagley Tunnel Adit Discharge and Surface Water

In 2015 and 2016, three total water quality sampling locations were collected for the Frisco/Bagley Tunnel (**Table 4-1**). Samples were collected from an adit discharge channel (A12), upstream of the mine in California Gulch (A13), and downstream of the mine (CG9) (**Figure 4-16**).

In the adit discharge channel (A12), flows ranged from 18 to 83 gpm during high-flow conditions in June 2015 and 2016, and from 18 to 58 gpm during low-flow conditions in September 2015 and October 2016. pH at the adit ranged from 6.25 to 7.14 su in 2015 and 2016. Upstream of the Frisco/Bagley Tunnel at A13, flow was 25,192 gpm in June 2015, and flow ranged from 521 to 2,053 gpm in September 2015 and 2016, respectively. Downstream flows at CG9 were similar. Upstream (A13) pH in June 2015 and 2016 ranged from 6.20 to 6.57 su, which decreased and ranged from 5.31 to 5.43 su in September 2015 and 2016, indicating that seasonal changes in pH are occurring in this area. Downstream of the mine at CG9, June 2015 and 2016 samples had a pH range of 6.28 to 6.50 su, and a range of 5.27 to 5.48 su in September.

The Frisco/Bagley Tunnel adit channel samples all exceeded acute standards for Mn and Zn, and chronic standards for Al, Cd, and Fe. The upstream samples all exceeded acute standards for Al, Cd, Cu, and Zn. Also, except the June 2015 sample, all upstream samples exceeded the acute standard for Mn, and except the September 2016 sample, all upstream samples exceeded the chronic standard for Pb. The downstream samples all exceeded acute standards for Cd and Zn. Also, except the September 2015 sample, all downstream samples exceeded the acute standard for Al, except the September 2016 sample, all downstream samples exceeded the acute standard for Cu and the chronic standard for Pb, and except the June 2015 sample, all downstream samples exceeded the acute standard for Mn. The data from **Table 4-1** indicate that metals concentrations in California Gulch at this point were higher during fall low-flow conditions when compared to June high-flow conditions.

#### 4.9.4.2 Frisco/Bagley Tunnel CDMG and EPA/ESAT Waste Rock SPLP

Two leachate samples were collected by CDMG from waste rock and tailings at the Frisco/Bagley Tunnel (**Table 4-2**). These samples exceeded the acute standards for Cd, Cu, Pb, and Zn, and the tailings sample exceeded the chronic standard for Al. CDMG and USGS estimated 41,000 and 20,500 cy of waste rock material onsite, respectively.

Per **Table 4-3**, two SPLP samples were analyzed from waste rock samples collected in August 2015 at the Frisco/Bagley Tunnel (AE10 and AE10A). The AE10 sample exceeded the acute standards for Cd and Zn, and chronic standards for Mn and Pb. The AE10A sample exceeded the chronic standards for Cd, Mn, and Pb, and had the lowest waste rock SPLP concentrations for Zn waste rock samples among the Animas River mining-related sources.

#### 4.9.4.3 Frisco/Bagley Tunnel Soils, Waste Rock, and Sediment

**Table 4-4** presents 2015 and 2016 soil and waste rock sample results for the Frisco/Bagley Tunnel. Samples were collected from two waste rock locations (AE10 and AE10A), a location north of the mine (GC-OPP), an upstream location in California Gulch (A13), and a downstream location in California Gulch (CG9). The downstream sample had the highest Mn and Zn concentrations of any sample collected in the Upper Animas River.

Per **Table 4-5**, sediment samples were collected in 2015 and 2016 at three locations at the Frisco/Bagley Tunnel. Metals concentrations exceeded sediment screening levels for As, Cd, Cu, Pb, Mn, and Zn at all locations, and Fe exceeded sediment screening levels at the adit drainage in September 2016. Sediment concentrations of Fe and Zn at the adit drainage were the highest measured among Animas River mining-related sources, and metals concentrations typically increased between the upstream and downstream sample.

#### 4.9.5 Columbus Mine

The Columbus Mine adit is located across the stream in California Gulch from Animas Forks at an elevation of 11,240 feet NGVD29. The site is adjacent to County Road 9 and is accessible to the public. CDMG and USGS both estimated 24,000 cy of waste rock onsite. The site has a single discharging adit that infiltrates into the waste rock pile, which flows south for approximately 300 feet before emerging at the base of the waste rock and enters California Gulch. There are a series of seeps below both levels of the waste rock pile that may be from the adit discharge. The waste rock pile is both moderately eroded and being undercut at the creek. At the adit, a 3-foot by 3-foot grate is installed. There are four dilapidated buildings onsite. **Figure 4-17** shows sample locations and features of this mining-related source.

The following sections describe results of analyses conducted for the Columbus Mine surface water, SPLP, soils, waste rock, and sediments, as provided in **Tables 4-1 through 4-5**.

##### 4.9.5.1 Columbus Mine Adit Discharge and Surface Water

In 2015 and 2016, three total water quality sampling locations were collected for the Columbus Mine (**Table 4-1**). Samples were collected from an adit discharge (A11A), upstream of the mine in California Gulch (CG11), and downstream of the mine before confluence with the Upper Animas River (A10) (**Figure 4-17**).

At the adit discharge (A11A) in June 2015 and 2016, flow ranged from 27 to 37 gpm and pH ranged from 3.05 to 4.16 su. In October 2015 and 2016, flow at the adit ranged from 0.1 to 0.3 gpm and pH ranged from 2.85 to 2.89 su, indicating a notable seasonal change in adit discharge. Upstream of Columbus at CG11, flow was 21,799 gpm in June 2015 and pH ranged from 6.26 to 6.46 su in June 2015 and 2016, while flow ranged from 572 to 3,305 gpm and pH was 5.34 su in September 2015 and 2016. Downstream from the Columbus Mine at A10, pH was 6.18 su in June 2015 and flow was 16,137 gpm in June 2016, and flow ranged from 634 to 2387 gpm and pH ranged from 5.13 to 5.43 su in September 2015 and 2016.

The Columbus Mine adit samples all exceeded acute standards for Al, Cd, Cu, Mn, Pb, and Zn, and chronic standards for Fe. Adit samples from the Columbus Mine contained the highest concentrations of Cd and Zn measured in the Upper Animas basin. All upstream and downstream



samples exceeded acute standards for Cd, Cu, and Zn, and chronic standards for Pb. Except for the September 2015 and 2016 upstream samples, all samples also exceeded the acute standard for Al, and except for the June 2015 upstream sample, all samples exceeded the acute standard for Mn.

The data from **Table 4-1** indicate that adit metals concentrations were typically orders of magnitude higher than upstream and downstream concentrations in the West Fork Animas River, and that metals concentrations in the West Fork Animas River at the Columbus Mine were higher during September low-flow conditions than during June high-flow conditions.

#### 4.9.5.2 Columbus Mine CDMG and EPA/ESAT Waste Rock SPLP

One leachate sample was collected by CDMG from waste rock at the Columbus Mine (**Table 4-2**). This sample exceeded the acute standards for Cd, Cu, Pb, and Zn, and the chronic standard for Al. CDMG and USGS estimated there was 24,000 cy of waste rock material onsite.

Per **Table 4-3**, one SPLP sample was analyzed from waste rock samples collected in August 2015 at the Columbus Mine near the adit (AE13). This sample exceeded the acute standards for Cd, Cu, and Zn, and chronic standards for Mn and Pb.

#### 4.9.5.3 Columbus Mine Soils, Waste Rock, and Sediment

**Table 4-4** presents 2015 and 2016 waste rock sample results for the Columbus Mine. Samples were collected from the waste rock (AE13), an upstream location in California Gulch (CG11), and downstream location in California Gulch (A10).

Per **Table 4-5**, sediment samples were collected in 2015 and 2016 at two locations at the Columbus Mine. Metals concentrations exceeded sediment screening levels for As, Cd, Cu, Pb, Mn, and Zn at all locations, and Al and Hg exceeded sediment screening levels in the downstream sample in September 2015. The sediment concentration of Al in the downstream sample in September 2015 was the highest measured among Animas River mining-related sources.

## 4.10 Sampling Results at Mining-Related Sources – Animas Forks to Eureka

### 4.10.1 Campground 7

Campground 7 is located approximately 1.1 miles south of Animas Forks, on the west side of the Upper Animas River at the road fork below a bridge crossing the Upper Animas River.

Campground 7 is considered a dispersed campsite, an area that is suitable for camping or where camping is known to occur but may not be a formal campground. Campground 7 is near the former location of the Eclipse Smelter according to USGS (Church et al. 2007), at an elevation of approximately 10,800 feet. The site is accessible to the public and is used for recreational purposes. **Figure 4-18** shows relevant features of this mining-related source.

The following section describes results of analyses conducted for the Campground 7 location for soil/waste rock concentrations, as provided in **Table 4-4**. No surface water, leachability, or sediment samples are associated specifically with this location.

#### 4.10.1.1 Campground 7 Waste Rock

Per **Table 4-4**, a sample of soil/waste rock was collected in July 2016 from the Campground 7 location (CMP7). The sample exceeded the human health risk-based level for Pb.

#### 4.10.2 Silver Wing Mine

The Silver Wing Mine is located on the east side of the Upper Animas River, south of Animas Forks, at an elevation of 10,500 feet NGVD29. This mining-related source is generally not accessible to the public. CDMG and USGS estimated 10,000 cy of waste material onsite. Adit flow is directed into a settling pond, which was formerly directed through bioreactor tanks prior to discharge to the Upper Animas River. The bioreactor tanks are not functional, and flow currently bypasses the former tanks and is piped to the river. **Figure 4-19** shows relevant features of this mining-related source.

The following sections describe results of analyses conducted for Silver Wing Mine surface water, SPLP, soils, waste rock, and sediments, as provided in **Tables 4-1 through 4-5**.

##### 4.10.2.1 Silver Wing Mine Surface Water

In 2015 and 2016, four total water quality sampling locations were collected for the Silver Wing Mine (**Table 4-1**). Samples were collected from the adit discharge location (A29), a discharging pipe into the Animas River (A29A), upstream of the mine in the Upper Animas River (A28), and downstream of the mine in the Upper Animas River (A30) (**Figure 4-19**).

The flow rate was measured only once at the adit (A29) in June 2016 at 7.3 gpm. Flow at the discharge point into the Upper Animas River (A29A) was not measured in 2015 or 2016 so it is unknown if flow is lost between the adit and the pipe discharge point. Flow was measured in September 2015 at the upstream (A28) and downstream (A30) points to be 1,754 and 2,503 gpm, respectively. Flow was not reported at the upstream and downstream locations in the Upper Animas River in 2016. At the adit, pH ranged from 6.42 to 6.49 su in June 2015 and June 2016, respectively, and was 5.74 su in September 2015. pH was not reported at the adit in September 2016. At the discharging pipe, pH ranged from 6.96 to 7.08 su in June 2015 and 2016. In June 2015 and 2016, upstream pH ranged from 7.57 to 7.62 su, and downstream pH ranged from 7.52 to 7.54 su. In September 2015, a change in pH between upstream and downstream was observed (7.03 and 5.82 su, respectively).

At the adit and adit discharging pipe, water quality samples exceeded acute standards for Cd, Cu, and Zn, and exceeded the chronic standard for Al, Fe, and Mn. Except for the June 2015 sample, adit samples exceeded the chronic standard for As. There does not appear to be a significant increase in metals concentrations between high- and low-flow conditions at the adit.

Upstream of the Silver Wing Mine in the Upper Animas River, water samples exceeded acute standards for Cd and Zn, and the chronic standards for Al. At this location, acute standards were also exceeded for Cu and Mn during June and September 2015, respectively.

Downstream of the mine, acute standards were exceeded for Cd and Zn, and chronic standards for Al. The June 2015 and 2016 downstream samples also exceeded the acute standards for Cu and the chronic standard for Pb. The September 2015 sample also exceeded the acute standard for Mn

and the chronic standard for Cu. Between high-flow and low-flow conditions at both the upstream and downstream points, there is an increase in metals concentrations in the Upper Animas River.

#### 4.10.2.2 Silver Wing Mine Leachate

One leachate sample was collected by CDMG from waste rock at the Silver Wing Mine (**Table 4-2**). This sample exceeded the acute standards for Al, Cd, Cu, Mn, Pb, and Zn, and the chronic standard for Fe. CDMG and USGS estimated 10,000 cy of waste rock material onsite.

Per **Table 4-3**, two SPLP samples were analyzed from waste rock samples collected in August 2015 at the Silver Wing Mine near the adit (AE32A and AE32b). At AE32A, leachate concentrations exceeded acute standards for Cd, Cu, Pb, and Zn, and chronic standards for Al and Fe. At AE32b, leachate concentrations exceed acute standards for Al, Cd, Cu, Pb, and Zn, and chronic standards for Fe and Mn. At the AE32B location, the waste rock SPLP concentration of Cu was orders of magnitude higher than those typically found in the other Animas River mining-related sources.

#### 4.10.2.3 Silver Wing Mine Soils, Waste Rock, and Sediment

Per **Table 4-4**, two waste rock samples were collected in August 2015 from the Silver Wing Mine site (AE32A and AE32b).

Per **Table 4-5**, sediment samples were collected in August and September 2015 at two locations at the Silver Wing Mine. Metals concentrations exceeded sediment screening levels for As, Cd, Cu, Pb, Mn, and Zn at both locations. Concentrations of Al, Cu, and Mn typically increased between the upstream and downstream sample locations.

### 4.10.3 Tom Moore Mine

The Tom Moore Mine adit is located approximately 1.25 miles north of Eureka on County Road 2 at an elevation of 10,360 feet NGVD29. The mine is located across the Upper Animas River from the road and has very limited accessibility to the public. CDMG and USGS both estimated 4,000 cy of waste rock onsite. The waste rock pile is located immediately adjacent to the Upper Animas River, and erosion and undercutting of the waste rock is observed. A concrete foundation is present onsite. **Figure 4-20** shows relevant features of this mining-related source.

The following sections describe results of analyses conducted for Tom Moore Mine surface water, SPLP, soils, waste rock, and sediments, as provided in **Tables 4-1 through 4-5**.

#### 4.10.3.1 Tom Moore Mine Adit Discharge and Surface Water

In 2016, three total water quality sampling locations were collected for the Tom Moore Mine (**Table 4-1**). Samples were collected from the adit discharge location (DM22), upstream of the mine (A30A), and downstream of the mine (A30B) (**Figure 4-20**).

Flow was measured at the adit location (DM22) in September 2016 to be 21 gpm, and pH at this location was 7.31 su in June 2016. Downstream of the mine at A30B, flow was 7,096 gpm in September 2016. Upstream pH ranged from 6.94 to 7.29 su at A30A, and downstream pH ranged from 6.97 to 7.45 su, where the lower pH values corresponded to fall low-flow conditions.

At the Tom Moore Mine adit, acute standards were only exceeded for Zn, and chronic standards for Cd. Upstream and downstream metals concentrations exceeded acute standards for Cd and Zn,

and chronic standards for Al. At this point in the Upper Animas River, acute Cu standards were exceeded during June 2015 and 2016 high-flow conditions and acute Mn standards were exceeded during September low-flow conditions. Metals concentrations in the Upper Animas River were also generally higher during low-flow conditions.

#### **4.10.3.2 Tom Moore Mine CDMG and EPA/ESAT Waste Rock SPLP**

One leachate sample was collected by CDMG from soil/waste rock at the Tom Moore Mine (**Table 4-2**). This sample exceeded the acute standards for Al, Cd, Cu, Mn, Pb, and Zn, and the chronic standard for Fe. CDMG and USGS estimated 4,000 cy of waste rock material onsite.

Per **Table 4-3**, one SPLP sample was analyzed from waste rock samples collected in July 2016 at the Tom Moore Mine (WR-TM). This sample exceeded the acute standards for Cd, Cu, Mn, Pb, and Zn, and chronic standards for Al and Fe. Waste rock SPLP concentrations of Al, Cd, Mn, and Zn in this waste rock sample were significantly higher than those typically found in the Animas River mining-related sources.

#### **4.10.3.3 Tom Moore Mine Soils, Waste Rock, and Sediment**

Per **Table 4-4**, one waste rock sample was collected in August 2016 from the Tom Moore Mine at an onsite waste rock location (WR-TM).

Per **Table 4-5**, sediment samples were collected in 2016 at two locations at the Tom Moore Mine. Metals concentrations exceeded screening levels for As, Cd, Cu, Pb, Mn, and Zn at both locations. Metals concentrations in sediments did not typically increase between the upstream and downstream sample.

## **4.11 Sampling Results at Mining-Related Sources – Eureka Gulch**

### **4.11.1 Ben Franklin Mine**

This Ben Franklin Mine is located immediately below the confluence of the headwaters of Eureka Gulch at an elevation of 11,920 feet NGVD29. The site is adjacent to County Road 25 and is accessible to the public. A barbed wire fence is present surrounding a stope at the site. Currently, stream flow has been diverted through a culvert across the road to the main channel of Eureka Gulch to avoid flowing through the stope. The mine adit shows signs of seasonal discharge. The waste rock pile is located adjacent to Eureka Gulch and there is a moderate degree of erosion of this waste rock. USGS estimated 500 cy of waste rock onsite. A portion of the waste rock has been used to create a levee for the stream channel. Waste rock at the adit discharge smells of sulfur. Eureka Gulch flows on the north side of waste rock. There is stressed vegetation below the waste rock. There are no structures onsite. **Figure 4-21** shows relevant features of this mining-related source.

The following sections describe results of analyses conducted for Ben Franklin Mine surface water, SPLP, soils, waste rock, and sediments, as provided in **Tables 4-1 through 4-5**.

#### 4.11.1.1 Ben Franklin Mine Adit Discharge and Surface Water

In 2015 and 2016, four total water quality sampling locations were collected for the Ben Franklin Mine (**Table 4-1**). Samples were collected from the drainage of the waste rock pile (ARD1), upstream of the mine before culvert under road (EG3A), near the midpoint of the Ben Franklin Mine waste rock in Eureka Gulch (EG5), and downstream of the mine (A39A) (**Figure 4-21**).

Upstream of the mine at EG3A, flow was 35 gpm September 2015 and 4,657gpm in June 2016, while flow was 222 gpm in September 2016 at the mine midpoint location (EG5). At the upstream location, pH ranged from 6.24 to 7.25 su, with the lower pH occurring during spring high-flow conditions in 2016. At the mine midpoint location, pH ranged from 7.01 to 7.14 su, while pH was 7.59 su in June 2016 at the downstream location. At the waste rock pile drainage location (ARD1), pH ranged from 2.76 to 3.10 su.

At the waste rock pile drainage location, acute standards were exceeded for Al, Cd, Cu, Mn, Pb, and Zn, and chronic standards for Fe. These metals concentrations from the waste rock pile were orders of magnitude above those found upstream and downstream of the mine in Eureka Gulch. Upstream of the Ben Franklin Mine, June 2016 acute standards were exceeded for Cd, Cu, and Zn, while September 2015 exceeded the acute standard for Zn, and chronic standards for Cd, Cu, and Pb. Downstream in June 2016, acute standards were exceeded for Cd, Cu, and Zn, and chronic standards for Al, and Pb. In June 2016, the midpoint waste rock sample exceeded acute standards for Cd, Cu, and Zn, and chronic standards for Al and Pb. Metals concentrations were generally higher during spring high-flow conditions when compared to fall low-flow conditions at the upstream and midpoint sample locations.

#### 4.11.1.2 Ben Franklin Mine CDMG and EPA/ESAT Waste Rock SPLP

Two leachate samples were collected by CDMG from waste rock at the Ben Franklin Mine (**Table 4-2**). The prospect sample exceeded the acute standards for Cd, Cu, Mn, Pb, and Zn, and the mine sample exceeded the acute standards for Al, Cd, Cu, Mn, Pb, and Zn, and the chronic standard for Fe. CDMG and USGS estimated 500 cy of waste rock material onsite.

Per **Table 4-3**, one SPLP sample was analyzed from waste rock samples collected in August 2015 at the Ben Franklin Mine (BE4). This sample exceeded the acute standards for Cd, Cu, Mn, Pb, and Zn, and chronic standards for Al and Fe.

#### 4.11.1.3 Ben Franklin Mine Soils, Waste Rock, and Sediment

Per **Table 4-4**, waste rock and soil samples were collected in 2015 and 2016 from the Ben Franklin Mine at a waste rock location (BE4), an upstream location in Eureka Gulch (EG3A), and a location downstream from the onsite stope (EG5).

Per **Table 4-5**, sediment samples were collected in 2015 and 2016 at three locations at the Ben Franklin Mine. Metals concentrations exceeded sediment screening levels for As, Cd, Cu, Pb, Mn, and Zn at all locations. Hg was elevated above sediment screening levels in the upstream September 2015 sample, and the September 2016 downstream sample had the highest Pb and Mn concentrations of the Animas River mining-related sources. Metals concentrations in sediments typically increased between the upstream and downstream samples.

### 4.11.2 Terry Tunnel

The Terry Tunnel is located just south of County Road 25 at an elevation of 11,560 feet NGVD29. There is a road onto the waste rock pile which is accessible to the public. The Terry Tunnel is bulkheaded and buried, and water flows out of the bulkheaded tunnel into a drainage ditch that directs water around the reclaimed waste rock pile. The waste rock pile has been covered by native rock material; Eureka Gulch flows below the toe of the waste rock pile. There are no structures onsite. **Figure 4-22** shows relevant features of this mining-related source.

The following sections describe results of analyses conducted for Terry Tunnel surface water, SPLP, soils, waste rock, and sediments, as provided in **Tables 4-1 through 4-5**.

#### 4.11.2.1 Terry Tunnel Adit Discharge and Surface Water

In 2015 and 2016, three total water quality sampling locations were collected for the Terry Tunnel (**Table 4-1**). Samples were collected from the tunnel drainage (A38), upstream of the reclaimed waste rock pile (A39), and downstream of Terry Tunnel in Eureka Gulch (EG6) (**Figure 4-22**).

At the Terry Tunnel drainage (A38), flow was not measured in June or September 2016; pH ranged from 7.07 su to 7.16 su. Upstream at A39 and downstream of Terry Tunnel at EG6, pH ranged from 7.10 to 7.55 su in 2015 and 2016. Flow downstream of the Terry Tunnel was 7,133 gpm in June 2016 and was 98 and 373 gpm in September 2015 and September 2016, respectively.

At the tunnel drainage, metals concentrations in 2016 exceeded acute standards for Mn and Zn. Upstream of the reclaimed waste rock, metals concentrations in June 2016 exceeded acute standards for Cd, Cu, and Zn, and chronic standards for Al and Pb. The September 2015 and 2016 upstream samples exceeded acute standards for Cu and Zn, and chronic standards for Al and Cd.

Downstream of Terry Tunnel in June 2015 and 2016, acute standards were exceeded for Cd, Cu, and Zn, and the chronic standard for Al. Downstream of Terry Tunnel in September 2015 and 2016, metals concentrations were lower than in June of those years and acute standards were exceeded only for Zn. These results indicate that the Terry Tunnel did not meaningfully contribute to metals concentrations in Eureka Gulch at these points in time.

#### 4.11.2.2 Terry Tunnel CDMG and EPA/ESAT Waste Rock SPLP

No waste rock leachability samples were collected at the Terry Tunnel during the CDMG or recent ESAT investigations.

#### 4.11.2.3 Terry Tunnel Soils, Waste Rock, and Sediment

Per **Table 4-4**, soil samples were collected in 2016 from the Terry Tunnel at an upstream location in Eureka Gulch (A39) and a downstream location (EG6).

Per **Table 4-5**, sediment samples were collected in 2015 and 2016 at two locations at the Terry Tunnel. Metals concentrations exceeded sediment screening levels for As, Cd, Cu, Pb, Mn, and Zn at all locations.



## 4.12 Sampling Results at Mining-Related Sources – Cunningham Gulch

### 4.12.1 Pride of the West Mine

The Pride of the West Mine is located on the east side of Cunningham Creek off of County Road 4 at an elevation of 10,280 feet NGVD29. The site is gated but is still accessible to the public by walking. The primary adit has a metal frame cover and is chained and padlocked. The primary adit discharges water through a channel on top of a large waste rock pile, through a culvert, and down a gully on the waste rock pile into the stream. Two additional, nonflowing, grated adits are located north of the flowing adit. The waste rock pile is of unknown size but is large and spans along the canyon wall. In 1997, approximately 84,000 cy of tailings were removed. The degree of erosion of the waste rock is moderate, and the pile is being undercut by the stream. There are six structures onsite in various stages of repair. There is an onsite bunkhouse, which is advertised as a vacation rental. **Figure 4-23** shows relevant features of this mining-related source.

The following sections describe results of analyses conducted for the Pride of the West Mine surface water, SPLP, soils, waste rock, and sediments, as provided in **Tables 4-1 through 4-5**.

#### 4.12.1.1 Pride of the West Mine Adit Discharge and Surface Water

In 2016, three total water quality sampling locations were collected for the Pride of the West Mine (**Table 4-1**). Samples were collected from an upstream location in Cunningham Creek (CU4), a downstream location in Cunningham Creek (CU4A), and an adit location (A50) (**Figure 4-23**).

In September 2016, upstream (CU4) and downstream (CU4A) flows were 6,610 and 6,739 gpm, respectively. Adit flow at A50 was not reported. 2016 upstream pH ranged from 7.39 to 7.45, downstream pH ranged from 7.23 to 7.36 su, and adit pH ranged from 7.67 to 7.75 su.

Upstream and downstream sampling points both exceeded acute standards for Al in June 2016. Fe was also elevated during June 2016 high-flow conditions relative to the fall. At the adit, all samples in 2016 exceeded acute standards for Cd and Zn and chronic standards for Al, while June 2016 samples also had exceedances of chronic standards for Cu and Pb.

#### 4.12.1.2 Pride of the West Mine CDMG and EPA/ESAT Waste Rock SPLP

No waste rock samples were collected at the Pride of the West Mine during the CDMG investigation. However, two SPLP locations were analyzed from waste rock samples collected in July 2016 (WR-PWN and WR-PWS) (**Table 4-3**). The WR-PWN sample exceeded the acute standard for Cd, and the chronic standards for Al, Pb and Zn. The 10- and 60-sieve portions of the WR-PWS sample both exceeded acute standards for Cd, Cu, Pb, and Zn, and the chronic standard for Al.

#### 4.12.1.3 Pride of the West Mine Soils, Waste Rock, and Sediment

Per **Table 4-4**, waste rock and soil samples were collected in 2016 from the Pride of the West Mine at north and south waste rock locations (WR-PWN and WR-PWS), an upstream location in Cunningham Creek (CU4), and a downstream location (CU4A).

Per **Table 4-5**, sediment samples were collected in 2016 at three locations at the Pride of the West Mine. At the adit, metals concentrations exceeded sediment screening levels for As, Cd, Cu, Pb, Mn, and Zn. Upstream of the mine in Cunningham Creek, metals concentrations exceeded sediment screening levels for Pb, Mn, and Zn. Downstream of the mine, sediments exceeded sediment screening levels for Cd, Pb, Mn, and Zn. Metals concentrations in sediments typically increased between the upstream and downstream sample.

## 4.13 Sampling Results at Mining-Related Sources – Howardsville to Silverton

### 4.13.1 Campground 4

Campground 4 is located near the Animas River adjacent to a spur road off of County Road 2 below Howardsville, approximately 900 feet below the Howardsville bridge over the Upper Animas River. The Campground 4 location sits at an elevation of approximately 9,600 feet. Campground 4 is considered a dispersed campsite, an area that is suitable for camping or where camping is known to occur but may not be a formal campground. The Campground 4 area was identified as a mine tailings area by CDMG, described as Mill Tailings Site #20 in Herron et al. (2000). The site is adjacent to the spur road and is accessible to the public and used for recreational purposes. **Figure 4-24** shows relevant features of this mining-related source.

The following sections describe results of analyses conducted for the Campground 4 location for leachability and soil/waste rock concentrations, as provided in **Tables 4-2** and **4-4**. No surface water or sediment samples are associated specifically with this location.

#### 4.13.1.1 Campground 4 CDMG Waste Rock SPLP

One leachate sample was collected by CDMG from the tailings and waste rock at the Campground 4 area/mill tailings site #20 (**Table 4-2**). The leachability results exceeded the acute standards for Cd, Cu, Mn, Pb, and Zn, and the chronic standard for Al. CDMG estimated 1,200 cy of tailings/waste rock material onsite.

#### 4.13.1.2 Campground 4 Waste Rock

Per **Table 4-4**, a sample of soil/waste rock was collected in 2016 from the Campground 4 location (CMP4). The sample exceeded the human health risk-based level for Pb. In addition to elevated Cu and Zn, this sample had the highest Pb and Hg in waste rock and soils measured in the Upper Animas River.



## Section 5

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## Tables

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**Table 2-1**  
**Evaluation Summary of Existing Data Reports**  
*Preliminary Remedial Investigation Report, Bonita Peak Mining District*

Data Source (originating organization, report title, and date)	Report Description (data types, generation, and collection dates)	Data generated under an approved quality plan or sampling document?	Measurement performance criteria met?	Reporting limits low enough to meet the performance criteria?	Data comparable to other accepted data sets?	Data relevant to existing site conditions?	How will the data be used?	Limitations on Data Use
USGS Professional Paper 1651 (2007)	Mine waste material volumes data collected 1996–2000	Unknown	NA	NA	NA	Yes	Approximation of mine waste material volumes	Volumes reported are estimated
CDMG Reclamation Feasibility Reports (Herron et al. 1997, 1998, 1999, and 2000)	Mine waste leachability test data collected 1997–1999	Unknown	Unknown	Unknown	Unknown	Yes	Screening-level comparison to water quality standards to evaluate metals leachability	Use for background information only
EPA/ESAT, Sampling and Analysis Report (ESAT 2016)	Surface water, sediment, soil/waste rock, and leachability test data collected 2015	Yes	Yes	Yes	Yes	Yes	Comparison to water quality standards and risk-based screening levels	None
EPA/ESAT, Sampling and Analysis Report (ESAT 2017)	2016 surface water, sediment, soil/waste rock, and leachability test data collected 2016	Yes	Yes	Yes	Yes	Yes	Comparison to water quality standards and risk-based screening levels	None

Notes:

USGS – U.S. Geological Survey

CDMG – Colorado Division of Minerals and Geology

NA – not applicable

EPA – U.S. Environmental Protection Agency

ESAT – Environmental Services Assistance Team

Table 4-1  
Total and Dissolved Metals for 2015 and 2016 EPA/ESAT Surface Water Samples  
Bonita Peak Mining District, San Juan County, Colorado  
Preliminary Remedial Investigation Report

					Metal Concentrations (µg/L)																															
					Aluminum				Arsenic				Cadmium				Copper				Iron				Manganese				Lead				Zinc			
					T	D	T	D	T	D	T	D	T	D	T	D	T	D	T	D	T	D	T	D	T	D	T	D	T	D	T	D				
Mine Location	Station Name	Sample Date	pH	Flow (gpm)	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q		
Longfellow Mine	M02D	6/29/2016	6.61	15	286		33.4	J	3.85	J	2.64		0.5	U	0.1	U	8.91		7.2		650		179	J	80		51.9		1.45		0.213		10	U	10	U
	M02D	10/7/2016	6.83	4.9	183		22.4	J	2.5	U	1.67	J	0.5	U	0.1	U	5.04		4.14		577		146	J	88.1		64.7		0.931	J	0.185	J	10	U	10	U
Junction Mine	M02B	6/29/2016	6.15	12	1720		227		143		57.2		7.17		7.46		261		182		16600		13500		348		365		131		5.26		1640		1770	
	M02B	10/7/2016	3.86	2.9	7110		6320		303		213		25.1		26.1		777		794		64000		56100		1780		1740		304		300		6590		6510	
Koehler Tunnel	M02K1	6/29/2016	4.54	0.1	3870		3720		2.5	U	2.5	U	40.7		40.5		3170		3310		324		309		16600		16400		3.19		3.29		17700		18100	
	M02C	10/7/2016	6.12	4.5	12900		1950		3000		1020		86.2		89.4		3140		2100		177000		152000		37600		37300		152		1.51		41500		41400	
	M02E	6/29/2016	--	--	3500		2460		177		30.4		19.4		21.1		891		863		17600		13000		7220		7020		100		36.6		7870		7930	
	M02E	10/7/2016	3.60	9.0	8100		7590		234		67.4		47.2		42.8		1610		1410		40400		33800		20800		17200		59.8		73.4		22400		18700	
	M02	6/29/2016	5.76	150	2590		422		119		15.1		12.2		12.5		522		449		10000		6710		4120		4050		75.3		8.87		4590		4690	
	M02	10/7/2016	8.03	23	6770		6190		90.3		30.3		35.7		36.4		1290		1320		17100		15200		16200		15600		35.5		35.1		16800		16400	
Brooklyn Mine	M12	6/7/2016	4.55	--	3460		290		7.59	J	0.5	U	0.726	J	0.719		15.6		6.08		7400		136	J	488		301		14.6		0.198	J	174		156	
	M12	6/29/2016	5.08	438	3370		3030		2.5	U	0.5	U	3.94		4.02		33.9		34.4		911		410		1320		1300		3.3		2.52		861		887	
	M12	9/29/2016	4.17	165	9130		8700		2.5	U	0.5	U	6.07		6.2		53.4		54.4		1210		1040		2280		2280		3.88		4.02		1300		1370	
	M12A	6/29/2016	4.51	--	3850		3120		2.5	U	0.5	U	1.05		1.11		22.9		22.3		1590		362		799		763		7.04		1.44		282		276	
	M12A	9/30/2016	4.45	151	10200		9630		2.5	U	0.5	U	1.28		1.49		31.7		32.2		1200		627		1440		1440		1.66		1.55		347		363	
	M12B	6/29/2016	4.76	223	3940		3510		2.5	U	0.5	U	0.5	U	0.266		11.1		11.2		966		419		545		535		1.11		0.65		61		54.6	
	M12B	9/30/2016	4.55	151	11900		11000		2.5	U	0.5	U	0.5	U	0.307		19.6		20.1		1770		1050		1190		1190		0.81	J	0.631		81		81.5	
	M12C	6/29/2016	3.63	7.3	1890		1010		20.7		0.5	U	14.9		15.6		236		177		26400		4070		5240		5100		25.1		1.69		4670		4600	
	M12C	9/29/2016	3.84	1.1	3620		2920		39.3		1.63	J	19.1		18.7		348		300		58800		16300		6440		6430		116		20.7		5780		6060	
	M12C	9/30/2016	3.84	1.1	3020		2450		20.6		2.7		19		18.8		319		302		33700		16600		6380		6390		25		18.2		5690		5950	
	M12D	9/30/2016	3.72	2.2	2770		2170		20.1		1.4	J	18.9		19		328		317		27600		10400		6300		6300		24.7		19.5		5810		6100	
	M12F	10/7/2016	7.79	--	83.1		48.1	J	2.5	U	0.908	J	0.5	U	0.1	U	2.5	U	0.945	J	105	J	100	U	193		4.09	J	0.5	U	0.1	U	10	U	10	U
	M12G	10/7/2016	4.07	--	642		576		2.5	U	0.5	U	0.5	U	0.433		22.1		23.8		591		502		938		915		126		125		117		121	
Bandora Mine	M23	9/27/2016	5.98	7351	2070		554		2.5	U	0.5	U	0.5	U	0.349		2.5	U	1.33		162	J	100	U	200		200		0.5	U	0.246		32.5		40	
	M24A	9/28/2016	6.96	--	957		36	J	12.8		0.5	U	67.8		35.8		1070		3.15		74900		195	J	6770		4870		977		0.147	J	13500		8750	
	M24B	9/28/2016	6.71	24	210		37.8	J	2.5	U	0.507	J	49.3		48		233		19.3		16100		5300		5290		4940		201		3.69		11200		11200	
	M24C	9/28/2016	7.41	--	31.2	J	30.1	J	2.5	U	2.5	U	0.5	U	0.5	U	2.5	U	2.5	U	112	J	141	J	2100		2030		0.663	J	0.581	J	540		541	
	M24D	9/27/2016	6.87	--	200		20	U	2.5	U	0.5	U	42.4		35.2		189		2.23		11500		100	U	4780		4630		177		0.1	U	10700		9250	
	M25	6/29/2016	6.28	21553	696		49.7	J	2.5	U	0.5	U	0.5	U	0.336		2.5	U	1.28		100	U	100	U	90.7		89.8		0.5	U	0.1	U	58.4		64.1	
M25	9/27/2016	6.12	9317	1840		266		2.5	U	0.5	U	0.54	J	0.622		2.5	U	1.2		159	J	100	U	207		202		0.5	U	0.1	U	104		111		
Grand Mogul Mine	CC01C	6/29/2016	3.59	--	2010		1850		2.5	U	1.56	J	18.7		17.6		470		462		2410		2210		1720		1660		39.7		38.2		3650		3660	
	CC01C	9/28/2016	4.10	3.6	10300		9720		37.1		39		95.4		97		2620		2620		57900		55100		6120		6050		27.9		26.4		24500		25100	
	CC01C1	6/29/2016	3.17	--	4570		4190		3.85	J	5.54		41.7		35.1	J	1440		1360		10000		12700		3760		3570		33.7		33		8850		8550	
	CC01C1	9/28/2016	3.96	2.8	15000		14100		20.3		21.8		127		130		5080		5070		54600		52200		11400		11300		7.59		7.12		31300		31600	
	CC01C2	6/29/2016	3.42	73	2960		2750		2.5	U	0.617	J	23.1		21.5		733		708		3030		2850		2180		2090		28.1		26.9		4680		4660	
	CC01C2	9/28/2016	4.12	9.0	8090		7730		2.5	U	2.94		69.1		62.9		2220		2130		9380		8900		5730		5610		22.1		21.5		14900		14700	
	CC01F	6/29/2016	7.27	--	238		97.6		2.5	U	0.5	U	1.19		1.2		31.1		20.6		100	U	100	U	82.5		78.2		8.04		3.8		267		261	
	CC01F	9/28/2016	7.16	--	372		114		2.5	U	0.5	U	2.7		2.77		59		29.7		100	U	100	U	126</											



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					Metal Concentrations (µg/L)																															
					Aluminum				Arsenic				Cadmium				Copper				Iron				Manganese				Lead				Zinc			
					T	D	T	D	T	D	T	D	T	D	T	D	T	D	T	D	T	D	T	D	T	D	T	D	T	D	T	D				
Mine Location	Station Name	Sample Date	pH	Flow (gpm)	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q		
Natalie/Occident al Mine	CC14	6/10/2015	6.09	--	1830		1150		4.46	J	1.88	J	5.25		4.68		86.9		67.6		19800		18000		1980		1940		7.3		0.339		843		884	
	CC14	9/29/2015	6.32	--	920		664		2.5	U	2.5	U	1.82		1.78		7.78		3.51	J	19600		18100		2630		2680		3.41		0.557	J	732		751	
	CC14	6/9/2016	6.13	--	2440		1900		2.5	U	5	U	5.59		5.9		90.8		75.9		27200		27200		2670		2680		9.84		1.63	J	1130		1150	
	CC14	9/29/2016	5.39	407	955		791		2.53	J	2.94	J	1.87		1.87		7.17		3.16	J	18600		17600		2520		2480		3.17		0.536	J	704		673	
	CC15	6/9/2016	--	7277	643		91.6		2.5	U	0.5	U	0.5	U	0.271		8.71		4.97		796		100	U	84.3		81.2		0.579	J	0.1	U	61.6		64.6	
	CC15	9/29/2016	7.00	301	446		95.8		2.5	U	0.5	U	0.5	U	0.226		5.38		2.92		145	J	100	U	64.2		63.5		0.5	U	0.1	U	36		36.1	
	CC15A	6/9/2016	--	7206	751		177		2.5	U	0.5	U	0.787	J	0.831		15.8		10.2		2920		2530		325		331		1.28		0.1	U	165		171	
	CC15A	9/29/2016	6.80	1170	868		267		2.5	U	2.5	U	1.16		1.2		8.95		4.21	J	9330		8340		1410		1390		1.93		0.5	U	403		391	
Henrietta Mine	CC24G	6/30/2016	4.61	--	1840		1790		2.72	J	3.5		0.5	U	0.293		36.9		35.8		20900		20400		72.9		75.6		3.3		3.17		116		123	
	CC22D	6/8/2016	5.76	--	488		84.4		2.5	U	0.5	U	1.65		1.61		46.1		37.1		944		127	J	92.1		73.4		31.4		8.1		406		432	
	CC22D	9/29/2016	5.79	73	1130		124		2.5	U	0.5	U	1.7		1.74		42.6		28.9		1440		211	J	307		289		59.9		18.3		435		400	
	CC22B	6/8/2016	4.73	--	811		622		2.5	U	0.5	U	1.11		1.22		34		33.8		663		312		110		109		23.9		18.1		302		333	
	CC22B	9/29/2016	4.33	131	3600		3120		2.5	U	0.5	U	1.43		1.61		33.6		33.3		533		347		584		567		43.8		40.3		376		372	
	CC24B	6/8/2016	4.37	--	904		666		2.5	U	0.848	J	1.08		1.29		58.9		57.9		1210		769		124		119		25.6		18.9		330		342	
	CC24B	9/29/2016	3.93	166	2790		2460		2.5	U	0.5	U	2.03		2.32		106		107		1740		1450		506		498		44.5		44.2		549		571	
	Anglo Saxon Mine	CC37	6/7/2016	6.53	41	500		477		7.91	J	6.93	J	2.75		2.52		7.68		7.03		28200		28400		8940		9050		10.3		2.04		2930		3040
CC37		9/28/2016	6.53	41	458		433		7.17	J	6.78	J	2.26		2.36		5.21		4.09	J	28700		25700		8700		8580		8.44		0.964	J	2830		2850	
CC38		6/7/2016	7.43	--	1160		86.5		2.6	J	0.5	U	0.5	U	0.363		11.9		6.54		2260		556		640		592		31.1		2.73		179		162	
CC38		9/28/2016	7.25	37	438		61.4		2.96	J	2.5	U	2.11		1.97		18.8		2.58	J	11600		6300		7860		7770		8.73		0.5	U	1790		1640	
CC38B		6/7/2016	6.15	59	885		790		6.39	J	3.32	J	2.06		2.08		58.8		65.9		20500		16300		11600		11600		9.54		0.542	J	2290		2450	
CC38B		9/28/2016	6.67	36	638		211		5.93	J	3.36	J	1.95		1.81		24.4		7.69		21800		17300		12400		12100		3.89		0.5	U	2530		2480	
CC38C		6/7/2016	7.07	--	1530		104		2.5	U	0.5	U	0.5	U	0.206		19.9		5.06		2160		100	U	105		18.2		110		2.85		103		49.5	
CC38C		9/28/2016	7.32	15	266		95.8		2.5	U	0.5	U	2.2		2.46		20.2		10.9		107	J	100	U	91		89.9		24.4		9.58		533		555	
CC39		6/7/2016	5.26	--	2140		643		4.72	J	0.5	U	2.26		2.19		70.1		53.9		6800		2100		932		869		50.9		5.29		669		658	
CC39		9/27/2016	3.62	7970	6770		5930		6.93	J	2.6	J	5.72		5.78		108		99.7		14800		10000		4460		4400		44.7		20.5		2400		2330	
CC39B		6/7/2016	5.10	--	2230		913		5.76	J	0.5	U	2.41		2.33		69.3		58.7		6790		2330		917		834		58.8		8.64		657		679	
CC39B		9/28/2016	3.82	6993	6180		5760		4.78	J	2.5	U	5.43		5.49		55		59		13700		12500		4690		4700		13.7		13.5		2140		2170	
Yukon Tunnel	CC41	6/7/2016	5.16	--	2410		907		4.12	J	0.5	U	2.98		2.91		99.4		72.6		8110		2460		1060		978		43.1		5.73		858		854	
	CC41	9/27/2016	3.55	6939	6220		5520		6.49	J	2.5	U	6.63		6.36		141		96.3		12500		7480		5110		4920		27.2		17.1		2610		2420	
	CC43C	6/7/2016	6.82	--	533		171		2.5	U	2.5	U	0.5	U	0.5	U	11.6		3.98	J	2460		1190		793		768		2.76		0.5	U	109		100	
	CC43C	9/27/2016	6.68	--	486		168		2.5	U	2.5	U	0.5	U	0.5	U	12.2		2.94	J	2440		1110		1130		1090		2.65		0.5	U	121		108	
	CC43D	6/7/2016	2.98	--	30900		28200		2.5	U	0.81	J	21.4		18.4		3610		2770		42900		39300		6530		6170		3.89		4.11		5810		5720	
	CC43E	6/7/2016	5.37	--	3020		891		5.63	J	0.5	U	3		3.19		104		82.3		10000		2250		1100		977		59.4		4.52		912		919	
	CC43E	9/27/2016	3.88	7069	5630		5240		3.6	J	2.5	U	5.06		5.01		84.9		81.9		10100		7080		4170		4150		15.2		13.9		2070		2050	
	Boston Mine	A07D	6/28/2016	4.23	--	5970		5550		2.5	U	0.5	U	7.55		7		38.9		34.6		242	J	149	J	2160		2100		11.6		9.47		1130		1140
A07D		10/5/2016	4.11	9.0	16000		15100		2.5	U	0.5	U	19.1		19.5		92.5		92.5		100	U	100	U	4860		4810		7.22		7.47		2840		2830	
A07D1		6/28/2016	4.26	55	19300		18000		2.5	U	0.5	U	33.2		32.4		55.5		51.3		100	U	100	U	6080		5890		1.52		1.26		6020		5870	
A07D2		6/28/2016	4.31	--	2340		2150		2.5	U	0.5	U	25.5		23.8		96.2		90		100	U	100	U	824		793		22.5		18.7		3740		3680	
A07E		6/28/2016	4.18	--	4830		4570		2.5	U	0.5	U	5.02		4.93		35.4		33		234	J	141	J	1820		1780		11.6		9.77		715		718	
A07E		10/5/2016	3.86	49	13800		13000		2.5	U	0.5	U	12.3		13.3		64.6		68.8		311		304		5090		4950		14		15.4		2150		2120	

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					Aluminum				Arsenic				Cadmium				Copper				Iron				Manganese				Lead				Zinc			
					T	Q	D		T	Q	D		T	Q	D		T	Q	D		T	Q	D		T	Q	D		T	Q	D		T	Q	D	
Mine Location	Station Name	Sample Date	pH	Flow (gpm)	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q		
London Mine	DM6	6/28/2016	6.13	3.2	121		88.5		2.5	U	0.5	U	8.17		8.7		30.3		30		443		324		189		197		61.7		48.3		1540		1680	
	DM6	9/30/2016	3.21	0.7	1220		1100		2.5	U	1.36	J	84.4		71.4		260		218		6180		4870		1640		1550		226		202		17200		17200	
	DM7	6/8/2016	6.69	--	360		23.1	J	4.25	J	0.595	J	13.8		12.8		41.3		4.53		2150		100	U	277		234		13.3		0.1	J	2930		2870	
	DM7	6/28/2016	6.05	1.1	644		41.2	J	11.9		2.58		46.2		43.2		107		9.99		4700		255		1030		984		22.1		0.23		8130		8120	
	DM7	9/30/2016	6.41	--	929		37.9	J	14.8		2.86		49.4		42		123		6.57		7400		312		1230		1230		27.9		0.1	U	8170		8280	
	A07B1	6/28/2016	4.28	1329	7230		6790		2.5	U	0.5	U	11.3		10.8		43.5		39.8		148	J	103	J	2540		2480		11.2		9.57		1810		1790	
	A07B	9/30/2015	4.30	21	14000		13400		2.5	U	0.5	U	21.7		23		49.8		51.5		166	J	102	J	5890		6110		8.87		9.44		3990		4340	
	A07B	6/28/2016	4.323	1206	6860		6440		2.5	U	0.5	U	10.4		10.7		42.2		38.9		134	J	108	J	2380		2340		10.8		9.34		1690		1720	
	A07B	9/30/2016	4.08	186	17100		17000		2.5	U	0.5	U	26.4		24.1		61.6		56.6		170	J	161	J	5980		5920		10.5		9.35		4260		4280	
Ben Butler Mine	BB1	6/28/2016	3.97	--	546		502		2.5	U	0.5	U	10.7		10.6		192		189		373		303		92.8		89.6		830		819		2080		2050	
Mountain Queen Mine	A18	10/6/2016	7.30	--	520		87.5		2.5	U	2.5	U	2.53		2.53		46.4		27.9		123	J	100	U	498		476		0.996	J	0.5	U	374		360	
	A19A	9/30/2015	3.70	0.8	3310		3200		2.5	U	1.42	J	44.5		45.7		1270		1270		5110		5050		5750		5700		192		208		5630		6230	
	A19A	9/28/2016	--	2.7	3270		3180		2.5	U	1.32	J	43		37.9		1260		1150		5470		5100		4190		4030		139		137		5060		4920	
Vermillion Mine	CG4	9/30/2015	5.01	247	16300		15500		2.5	U	0.5	U	18.2		18.7		47.2		72.6		140	J	127	J	36400		36600		0.567	J	0.552		6030		6270	
	CG4	6/28/2016	6.58	6127	3820		2790		2.5	U	0.5	U	5.49		5.81		18.5		16		108	J	100	U	9020		9210		1.16		0.452		1550		1660	
	CG4	10/6/2016	5.47	1006	14900		12100		2.5	U	0.5	U	13.8		14.2		36.6		34.8		495		183	J	27300		26600		1.36		0.644		4380		4240	
	CG5	6/28/2016	5.48	--	628		602		2.5	U	0.5	U	7.84		7.67		61.3		60.5		100	U	100	U	472		479		47.7		44.8		1730		1900	
	CG6	9/30/2015	5.17	189	13700		12000		2.5	U	0.5	U	15.9		16.4		41.2		35.9		151	J	106	J	31600		31500		1.41		0.597		5260		5310	
	CG6	6/28/2016	6.46	7803	3620		2540		2.5	U	0.5	U	5.74		5.65		18.3		15.8		111	J	100	U	8750		8630		2.16		1.21		1560		1620	
	CG6	9/30/2016	4.97	785	11900		10400		2.5	U	0.5	U	12.2		11.1		31.8		25.6		100	U	100	U	25600		25700		0.889	J	0.414		3510		3700	
	CG6A	6/29/2016	6.57	5679	4500		2390		2.5	U	0.5	U	5.57		5.58		23.4		14.9		1150		100	U	8350		8360		26.2		1.4		1580		1690	
Sunbank Group Mine	A21	9/29/2015	5.54	76	2290		815		2.5	U	0.5	U	3.85		3.93		14.2		12.6		1020		801		1880		1900		34.1		32.6		1700		1780	
	A21	6/29/2016	6.94	4916	1050		125		2.5	U	0.5	U	3.88		3.55		42.3		27.3		100	U	100	U	3120		2980		9.02		2.35		1410		1340	
	A21	9/30/2016	5.93	515	1490		304		2.5	U	0.5	U	4.03		3.65		18.1		12.4		289		248	J	1550		1480		103		7.61		1610		1560	
	A22	9/29/2015	5.97	61	340		29.7	J	2.5	U	0.5	U	1.84		1.99		8.15		4.71		100	U	100	U	346		348		4.52		2.01		1050		1150	
	A22	6/29/2016	6.99	3576	1090		148		2.5	U	0.5	U	3.65		3.62		43		31.1		100	U	100	U	3370		3250		6.09	J	1.05		1360		1360	
	A22	9/30/2016	6.46	531	1160		76.1		2.5	U	0.5	U	3.11		2.96		14.1		7.3		100	U	100	U	1250		1190		4.32		0.863		1430		1380	
	A21A	9/29/2015	4.79	16.4	13600		13500		2.5	U	1.4	J	12.1		12.1		2.5	U	1.44		16400		16300		9460		9600		194		198		4590		4930	
	A21A	6/29/2016	5.51	--	14100		13200		2.5	U	1.29	J	11.9		10.9		2.5	U	0.774	J	19200		16500		8980		8750		253		216		4300		4270	
	A21A	9/30/2016	3.78	--	15100		15000		2.5	U	1.76	J	13.3		13		2.5	U	1.04		18000		17100		9160		8980		188		190		4710		4670	
Frisco/Bagley Tunnel	A12	6/9/2015	7.14	83	285		107		2.5	U	1.34	J	4.69		4.69		5.29		4.7		2390		2210		7950		8190		4.02		0.591		3500		3830	
	A12	10/1/2015	6.25	18	434		285		2.5	U	2.47		4.47		4.77		2.5	U	2.36		4390		3550		16500		16600		1.39	J	0.482		5470		6080	
	A12	6/7/2016	6.48	18	642		550		2.5	U	2.14		7.76		8.51		7.36		6.95		4450		4170		16300		16300		1.61		0.355		6640		6980	
	A12	9/28/2016	--	58	356		325		2.5	U	1.86	J	5.43		4.94		2.93	J	2.62		2450		2210		13900		13700		0.5	U	0.1	U	5090		5060	
	A13	6/9/2015	6.20	25192	1120		305		2.5	U	0.5	U	2.39		2.26		22.9		11.5		239	J	100	U	1960		1980		28.9		2.82		757		802	
	A13	9/29/2015	5.31	521	7530		5590		2.5	U	0.5	U	9.78		10.2		31.4		28.3		292		203	J	18200		18900		8.85		7.83		3500		3920	
	A13	6/7/2016	6.57	--	2060		966		2.5	U	0.5	U	2.87		2.49		28.2		8.33		633		100	U	3510		3280		106		2.44		950		859	
	A13	9/30/2016	5.43	2053	6270		4680		2.5	U	0.5	U	7.17		6.88		22.7		17.2		152	J	117	J	13400		13400		4.2		2.56		2360		2360	
	CG9	6/9/2015	6.28	23919	1020		267		2.5	U	0.5	U	2		2.07		17.9		10.3		206	J	100	U	1910		1880									

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					Metal Concentrations (µg/L)																															
					Aluminum				Arsenic				Cadmium				Copper				Iron				Manganese				Lead				Zinc			
					T		D		T		D		T		D		T		D		T		D		T		D		T		D		T		D	
Mine Location	Station Name	Sample Date	pH	Flow (gpm)	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Columbus Mine	A10	6/9/2015	6.18	--	991		247		2.5	U	0.5	U	2.62		3.02		23.1		16.2		199	J	100	U	2100		2080		14.4		2.81		967		969	
	A10	9/29/2015	5.43	634	6280		3800		2.5	U	0.5	U	11.1		11.6		41.2		39.4		401		306		17500		18000		8.13		7.22		4130		4560	
	A10	6/7/2016	--	16137	1480		774		2.5	U	0.5	U	2.54		2.72		20.5		12.9		195	J	100	U	3160		3100		37.3		3.67		934		932	
	A10	9/29/2016	5.13	2387	5480		3790		2.5	U	0.5	U	7.69		7.48		30.9		25.1		204	J	136	J	13000		12700		5.66		4.31		2670		2630	
	A11A	6/9/2015	3.05	37	3370		3160		8.65	J	6.38		194		193		2510		2510		11700		12200		1840		1900		1010		947		47000		51200	
	A11A	9/29/2015	2.89	0.1	31000		29500		12		12		1090		896		6800		6790		61100		61100		17600		17900		254		289		278000		302000	
	A11A	6/7/2016	4.16	27	3360		3450		5.91	J	5.43		180		173		2350		2310		11300		11600		1710		1720		911		913		40300		43100	
	A11A	9/30/2016	2.85	0.3	25600		24900		14		11		1030		938		6960		6300		54700		51600		12400		12100		302		254		229000		223000	
	CG11	6/9/2015	6.26	21799	1000		222		2.5	U	0.5	U	2.11		2.28		15.8		9.39		179	J	100	U	1910		1970		10.8		1.87		696		762	
	CG11	9/29/2015	5.34	572	6610		3830		2.5	U	0.5	U	9.54		10.2		31.5		27.9		440		324		17700		17600		7.29		5.96		3930		3930	
	CG11	6/7/2016	6.46	--	1480		587		2.5	U	0.5	U	2.29		2.17		24.9		8.96		306		100	U	2690		2550		89.9		2.74		765		759	J
CG11	9/30/2016	5.34	3305	5390		3510		2.5	U	0.5	U	6.89		6.28		22.4		17.1		173	J	163	J	12200		12100		4.15		3.23		2280		2380		
Silver Wing Mine	A28	6/9/2015	7.57	--	137		43.5	J	2.5	U	0.5	U	2.04		1.78		7.23		6.88		100	U	100	U	736		721		1.81		0.763		452		480	
	A28	9/30/2015	7.03	1754	1400		39.5	J	2.5	U	0.5	U	4.69		4.43		12.2		3.56		100	U	100	U	3870		3800		3.85		0.442		1360		1330	
	A28	6/28/2016	7.62	--	848		52		2.5	U	0.5	U	2.25		2.46		11.3		4.73		100	U	100	U	1850		1780		3.48		0.613		587		569	
	A30	6/9/2015	7.52	--	454		44.7	J	2.5	U	0.5	U	2.07		1.85		23.5		13.4		115	J	100	U	745		715		7.76		0.918		507		496	
	A30	9/30/2015	5.82	2503	1390		42.9	J	2.5	U	0.5	U	4.79		4.44		83.2		19.3		180	J	100	U	3810		3750		4.82		0.313		1440		1410	
	A30	6/7/2016	7.54	--	747		54.6		2.5	U	0.5	U	1.9		1.92		18.6		7.99		204	J	100	U	1250		1190		14.6		0.672		505		504	
	A29	6/9/2015	6.42	--	1380		428		99.7		2.5	U	14		14.1		6190		2320		10900		2470		3100		3120		25.8		0.5	U	3950		4010	
	A29	9/30/2015	5.74	--	1860		958		132		4.4		16.6		15.1		10200		4200		16000		6130		3520		3480		25.5		0.1	U	4320		4500	
	A29	6/7/2016	6.49	7.3	1590		762		161		2.87		16.1		16.4		6280		2730		13700		3870		3300		3170		22.7		0.1	U	4220		4260	
	A29	9/28/2016	--	--	1590		603		110		3.1		14.8		14.6		6970		2770		11700		2790		3290		3250		19.1		0.159	J	4020		3870	
	A29A	6/9/2015	6.96	--	825		31.5	J	39.7		2.5	U	13.4		13.5		3820		712		5570		100	U	3030		3040		12.8		0.5	U	3790		3830	
A29A	6/7/2016	7.08	--	1800		98.5		143		1.17	J	14.7		15.3		6660		509		15600		137	J	3070		3130		61.8		0.1	U	3900		3960		
Tom Moore Mine	A30A	6/8/2016	7.29	--	659		45.8	J	2.5	U	0.5	U	1.86		1.82		15.6		6.44		201	J	100	U	1200		1120		11.5		0.582		469		474	
	A30A	9/29/2016	6.94	--	1740		74.2		2.5	U	0.5	U	4.25		3.98		35.2		7.45		102	J	100	U	3760		3670		3.22		0.321		1130		1030	
	A30B	6/8/2016	7.45	--	602		47.3	J	2.5	U	0.5	U	1.68		1.71		14.5		5.98		204	J	100	U	1100		1010		12.1		0.532		433		433	
	A30B	9/29/2016	6.97	7096	1810		67.5		2.5	U	0.5	U	4.09		3.98		53.4		7.79		128	J	100	U	3670		3580		3.48		0.339		1120		1020	
	DM22	6/28/2016	7.31	--	29.6	J	23.3	J	2.5	U	0.5	U	1.14		1.18		2.5	U	0.515	J	100	U	100	U	409		411		0.826	J	0.284		627		673	
DM22	9/28/2016	--	21	27.1	J	23.9	J	2.5	U	0.5	U	0.77	J	0.811		2.5	U	0.598	J	100	U	100	U	165		156		0.5	U	0.1	U	572		619		
Ben Franklin Mine	ARD1	9/29/2015	3.10	--	7180		6370		2.5	U	0.558	J	57.5		55.6		1940		1970		3560		2390		22300		22300		840		861		19900		19500	
	ARD1	6/28/2016	2.76	--	3860		3630		2.5	U	0.5	U	43.8		41		1990		1880		5520		5190		12700		12300		745		720		12500		12300	
	ARD1	9/28/2016	3.12	--	9980		9650		2.5	U	2.5	U	79.7		72.9		2690		2420		4080		3940		26000		26100		747		686		23000		24300	
	EG3A	9/29/2015	7.25	35	63		31.7	J	2.5	U	0.5	U	0.551	J	0.588		11.4		9.78		100	U	100	U	116		107		4.18		2.45		217		215	
	EG3A	6/28/2016	6.24	4657	153		87.3		2.5	U	0.5	U	3.33		3.35		12.9		11.6		100	J	100	U	633		650		2.63		0.691		1120		1210	
	EG3A	9/29/2016	6.94	--	31.9	J	24.1	J	2.5	U	0.5	U	0.5	U	0.228		2.79	J	1.79		100	U	100	U	18.3		16.2		0.5	U	0.152	J	79.8		85.7	
	EG5	9/30/2015	7.14	--	31.8	J	25.6	J	2.5	U	0.5	U	0.5	U	0.535		6.27		5.53		100	U	100	U	53.2		53.2		1.68		1.12		221		228	
	EG5	6/28/2016	7.01	--	132		91.2		2.5	U	0.5	U	3.11		3.33		14.8		12.2		100	U	100	U	636		655		2.56		1.74		1120		1200	
	EG5	9/28/2016	7.70	222	96.5		64.4		2.5	U	0.5	U	1.18		1.18		12.2		8.05		100	U	100	U	144		144		3.11		1.48		493		529	
A39A	6/28/2016	7.59	--	133		99		2.5	U	0.5	U	3.25		3.19		16.2		13.8		100	U	100	U	607		593		3.06		2.14		1040		1030		

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					Metal Concentrations (µg/L)																															
					Aluminum				Arsenic				Cadmium				Copper				Iron				Manganese				Lead				Zinc			
					T		D		T		D		T		D		T		D		T		D		T		D		T		D		T		D	
Mine Location	Station Name	Sample Date	pH	Flow (gpm)	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Terry Tunnel	A38	6/28/2016	7.14	--	66.2		63.1		2.5	U	0.5	U	0.5	U	0.148	J	2.5	U	1.26		237	J	100	U	10600	10400		2.36		0.1	U	1180		1150		
	A38	9/28/2016	7.07	--	82.3		76.3		2.5	U	2.5	U	0.726	J	0.5	U	2.5	U	2.5	U	940		100	U	11000	10700		8.53		0.5	U	1340		1220		
	A39	9/30/2015	7.10	--	118		48.8	J-	2.5	U	0.5	U	1.2		1.08		22.8		14.6		100	U	100	U	256		250		5.01		2.23		385		393	
	A39	6/28/2016	7.55	--	133		88.6		2.5	U	0.5	U	3.06		3.06		15.6		13.7		100	U	100	U	589		568		3.13		2.12		1000		1010	
	A39	9/28/2016	7.51	--	180		109		2.5	U	0.5	U	1.73		1.61		29.7		17.9		100	U	100	U	310		305		7.6		2.09		618		630	
	EG6	6/10/2015	7.36	--	229		91		2.5	U	0.5	U	2.69		2.69		25.8		19.7		190	J	100	U	1340		1280		6.08		1.83		1110		1080	
	EG6	9/30/2015	7.22	98	20	U	20	U	2.5	U	0.5	U	0.71	J	0.794		3.98	J	4.22		100	U	100	U	96.8		94.3		0.869	J	0.796		430		429	
	EG6	6/28/2016	7.44	7133	113		80.5		2.5	U	0.5	U	2.07		1.94		11.4		9.09		100	U	100	U	417		415		2.19		1.05		671		716	
Pride of the West Mine	EG6	9/28/2016	7.48	373	112		54.5		2.5	U	0.5	U	1.22		1.19		13.9		9.34		100	U	100	U	251		248		3.85		0.76		430		456	
	A50	6/7/2016	7.75	--	201		36.8	J	2.5	U	0.5	U	11.8		12.2		54.5		16.6		209	J	100	U	401		394		42.2		7.77		2190		2130	
	A50	9/28/2016	7.67	--	137		39.3	J	2.5	U	0.5	U	7.51		7.39		26.3		9.88		122	J	100	U	239		238		17.6		4.15		1360		1350	
	CU4	6/7/2016	7.39	--	1380		57		2.5	U	0.5	U	0.5	U	0.1	U	2.8	J	0.723	J	1420		100	U	152		4.21	J	27.5		0.298		13.2	J	10	U
	CU4	9/28/2016	7.45	6610	23.3	J	20	U	2.5	U	0.5	U	0.5	U	0.1	U	6.62		0.628	J	100	U	100	U	4.47	J	3.63	J	1.9		0.149	J	10	U	10	U
	CU4A	6/7/2016	7.36	--	658		60.7		2.5	U	0.5	U	0.5	U	0.1	U	3.88	J	0.93	J	770		100	U	174		4.84	J	46.4		0.488		35.1		10	U
	CU4A	9/28/2016	7.23	6739	33.9	J	20	U	2.5	U	0.5	U	0.5	U	0.152	J	2.5	U	0.882	J	100	U	100	U	6		4.03	J	1.27		0.296		24.3		28.6	

Notes:

- value exceeds WQCC acute standards

- value exceeds WQCC chronic standards

Q - qualifier  
J - Indicates an estimated value. The associated numerical value is the approximate concentration of the analyte in the sample  
"--" - data not available  
U - Indicates compound was analyzed for, but not detected in sample. Value shown is quantitation limit of method  
T - total recoverable  
gpm - gallons per minute  
D - dissolved  
µg/L - micrograms per liter

**Table 4-2**  
**CDMG Waste Rock Volume and Leachability Metals**  
**Bonita Peak Mining District, San Juan County, Colorado**  
**Preliminary Remedial Investigation Report**

Mine Site	Location	CDMG Volume of Waste Material (CY)	USGS Volume of Waste Material (CY)	Aluminum	Cadmium	Copper	Iron	Manganese	Lead	Zinc
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Mineral Creek										
Longfellow Mine	Longfellow Mine	10,000	5,500	--	--	--	--	--	--	--
Junction Mine	Junction Mine	NA	NA	NA	NA	NA	NA	NA	NA	NA
Koehler Tunnel	Koehler Tunnel Waste Rock: Removed	--	--	--	--	--	--	--	--	--
Brooklyn Mine	Brooklyn Recent	--	15,000	34,452	455	4,534	592,762	69,771	2,748	70,610
	Brooklyn Upper	--		37,895	177	2,186	568,294	10,068	226	9,327
	Brooklyn Lower	--		18,895	110	1,478	115,585	20,941	190	18,129
Bandora Mine	Bandora Mine	5,500	5,500	BDL	54	10	14	842	124	7,920
Cement Creek										
Grand Mogul Mine	Grand Mogul - West (of stope)	8,000	9,000	13,600	60	5,560	59,900	4	1,760	12,700
	Grand Mogul - East	9,000		13,000	557	8,120	207,000	5	2,570	107,000
Natalie/Occidental Mine	Natalie/Occidental Mine	6,800	6,800	11,100	9	372	44,000	0	490	1,260
Henrietta Mine	Henrietta 7 Mine North Pile (8 level)	30,000	5,600	1,030	8	198	3,470	0	617	1,730
	Henrietta 7 Mine South Pile		30,000	12,500	104	3,070	209,000	1	2,490	19,700
		Henrietta 3 Mine	--	2,000	37,200	127	18,300	853,000	3	2,230	19,400
Mammoth Tunnel	Mammoth Tunnel	--	100	900	3	56	300	1	BDL	410
Anglo Saxon Mine	Anglo Saxon Mine	2,200	2,200	32,000	107	5,350	524,000	5	545	17,600
Yukon Tunnel	Yukon Tunnel	18,000	18,000	2,390	8	120	510	4	5	1,170
Animas River										
Boston Mine	Boston (Lower Burrows Gulch Shaft)	900	900	88	4	32	230	120	100	710
London Mine	London Mine	3,300	3,300	230	10	140	830	270	4,000	1,700
Ben Butler Mine	Ben Butler Mine	500	500	12,000	350	3,500	97,000	530	3,000	71,000
Mountain Queen Mine	Mountain Queen Shaft	5,100	1,900	220	20	280	2,300	64	6,500	3,300
	Mountain Queen Adit			280	28	390	230	460	2,000	5,100
Vermillion Mine	Vermillion Mine	5,100	5,100	2,300	84	590	7,200	1,400	2,500	18,000
Sunbank Group Mine	Sunbank Group Mine	NA	NA	NA	NA	NA	NA	NA	NA	NA
Frisco/Bagley Tunnel	Bagley Tunnel	41,000	20,500	76	8	38	81	1,000	380	2,100
	Bagley Mill Tailings			130	9	180	160	190	13,000	1,800
Columbus Mine	Columbus Adit	24,000	24,000	440	54	660	190	2	1,000	10,000
Silver Wing Mine	Silver Wing Mine	10,000	10,000	12,000	120	15,000	48,000	21,000	2,500	16,000
Tom Moore Mine	Tom Moore Mine	4,000	4,000	12,000	270	760	6,000	34,000	1,000	58,000
Ben Franklin Mine	Ben Franklin Prospect	NA	NA	80	2	32	258	106	10,676	432
	Ben Franklin Mine	500	500	32,293	154	5,106	243,286	39,544	1,804	37,768
Terry Tunnel	Terry Tunnel	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pride of the West	Pride of the West	NA	NA	NA	NA	NA	NA	NA	NA	NA
Campground 4	Campground 4	1,200	NA	264	38	169	272	5,608	222	7,702

**Notes:**

All results shown are from the CDMG leaching tests; USGS test data is not provided

CDMG - Colorado Division of Minerals and Geology

USGS - United States Geologic Survey

NA - mine site not identified within CDMG/USGS dataset

"--" - mine site identified but has no data within CDMG or USGS dataset

- sample exceeds WQCC acute criteria

- sample exceeds WQCC chronic criteria

CY - cubic yards

µg/L - micrograms per liter

BDL - Below Detection Limit

T - total recoverable metals

\*Although the metals results shown in this table are for total metals, the standards for dissolved metals are discussed in this report as a guideline for analysis and consistency to the surface water discussions

\*\*Since data is not available, hardness is calculated assuming (conservatively) calcium and magnesium concentrations of 5000 µg/L, which are the basis for the WQCC standards calculations

Table 4-3  
Total Metals Concentrations for 2015 and 2016 EPA/ESAT SPLP Samples  
Bonita Peak Mining District, San Juan County, Colorado  
Preliminary Remedial Investigation Report

Sample Location	Mine Location	Sample Date	Aluminum (µg/L)		Arsenic (µg/L)		Cadmium (µg/L)		Copper (µg/L)		Iron (µg/L)		Manganese (µg/L)		Lead (µg/L)		Mercury (µg/L)		Zinc (µg/L)	
Mineral Creek																				
WR-M02B	Longfellow Mine	7/28/2016	200	U	13.3		5	U	25	U	411		52.4		88.9		0.2	U	60	U
WR-M02D	Junction Mine	7/28/2016	235		14.1		6.4		186		701		351		1410		0.2	U	943	
WR-M02C (10 sieve)	Koehler Tunnel	7/28/2016	317		541		5	U	25	U	5140		74.2		142		0.2	U	60	U
WR-M02C (60 sieve)		7/28/2016	347		560		5	U	34.1		6950		118		122		0.2	U	118	
WR-M12	Brooklyn Mine	7/28/2016	528		10	U	5	U	57		1010		644		186		0.2	U	419	
WR1-M12		7/28/2016	5280		10	U	15.7		411		18100		4800		1940		0.25	J+	2800	
WR2-M12		7/28/2016	1810		10	U	11.6		158		2960		3210		271		0.061	J+	2270	
WR1-M24	Bandora Mine	7/28/2016	531		10	U	136		43.6		1940		1240		453		0.1	J+	16300	
WR2-M24		7/28/2016	200	U	10	U	24.8		709		2170		404		7780		0.057	J+	3510	
WR3-M24		7/28/2016	205		10	U	112		63.7		1270		510		817		0.046	J+	8380	
WR4-M24		7/28/2016	200	U	10	U	4	J	25	U	355		23		50.7		0.16	J+	1140	
Cement Creek																				
WR-CC01C	Grand Mogul Mine	7/27/2016	492		10	U	22.9		686		549		405		9720		0.24	J+	4990	
WR-CC01C2		7/27/2016	397		10	U	19.2		342		1560		393		7970		0.24	J+	4140	
WR-CC02A		7/27/2016	429		4.8	J	5	U	76.8		1060		307		303		0.2	U	678	
WR-CC14A	Natalie/Occidental Mine	7/27/2016	766		10	U	5	U	25	U	1720		50.8		84.3		0.2	U	60	U
WR-CC14B		7/27/2016	1710		16.5		5	U	25	U	5500		206		313		0.2	U	153	
WR-CC22	Henrietta Mine	7/27/2016	235		10	U	5	U	25	U	1120		79.3		300		0.2	U	60	U
WR-CC29	Mammoth Tunnel	--	--		--		--		--		--		--		--		--		--	
WR-CC37 (10 sieve)	Anglo Saxon Mine	7/27/2016	200	U	10	U	5	U	25	U	473		1380		52.6		0.2	U	153	
WR-CC37 (60 sieve)		7/27/2016	3870		6.8	J	5	U	37		33100		2340		365		0.2	U	280	
WR-CC38B (10 sieve)		7/27/2016	3090		10	U	5.7		341		6950		164		1590		0.2	U	1300	
WR-CC38B (60 sieve)		7/27/2016	3470		4	J	6.8		410		7690		180		2030		0.52		1660	
WR-CC43	Yukon Tunnel	7/27/2016	8030		4.6	J	6.2		501		14200		991		1630		0.2	U	1200	
Animas River																				
WR-BSN	Boston Mine	7/26/2016	200	U	10	U	6.4		25	U	644		40.1		110		0.081	J+	876	
WR1-LND	London Mine	7/26/2016	373		10	U	4.9	J	106		1270		50.7		284		0.15	J+	409	
WR2-LND		7/26/2016	200	U	10	U	7.9		29.7		100	U	511		395		0.1	J+	1510	
AE18		8/5/2015	39.3	J	10	U	12		62.2		54.7	J	103		3870	J-	0.19	J-	2370	
WR-BB	Ben Butler Mine	7/26/2016	200	U	10	U	43.2		104		1230		140		7930		0.11	J+	7450	
AE1	Mountain Queen Mine	8/5/2015	89.9	J	10	U	12.4		173		503		34.6		10200	J-	0.2	UJ	2050	
AE2		8/5/2015	60	J	10	U	5	U	12	J	47	J	222		24.5	J-	0.2	UJ	81.8	
AE9A	Vermillion Mine	7/27/2016	443		18.9		0.13	J	26.1		2480		15	U	1120		2	J+	85.1	
AE44	Sunbank Group Mine	8/6/2015	200	U	10	U	0.5	J	5	J	100	U	609		26	J-	0.2	U	49.1	J
AE45		8/6/2015	2550		10	U	9.2		217		133		4980		235	J-	0.2	UJ	1480	
AE46		8/6/2015	985		10	U	7.2		210		51	J	4210		49	J-	0.2	UJ	1340	
AE10	Frisco/Bagley Tunnel	8/5/2015	200	U	10	U	12.9		1.9	J	100	UJ	1300		9	J-	0.2	U	2850	J
AE10A		8/5/2015	200	U	10	U	0.9	J	3.6	J	100	U	1490		8	J-	0.2	U	12.3	J
AE13	Columbus Mine	8/4/2015	200	U	10	U	11.4		6.1	J	100	U	1110	J-	4.7	J	0.36		1680	J-
AE32A	Silver Wing Mine	8/4/2015	1630		7.6	J	11.6		1920		7750		736		4660		0.2	U	2490	
AE32B		8/4/2015	965		4.2	J	9.7		10000	J	1310		1140	J-	296	J	0.13	J	1830	J-
WR-TM	Tom Moore Mine	7/27/2016	1890		95.7		87.5		163		2790		3810		566	J	0.14	J+	17200	
BE4	Ben Franklin Mine	8/4/2015	505		10	U	7.7		251		1170		2680		1300		0.2	U	2250	
--	Terry Tunnel	--	--		--		--		--		--		--		--		--		--	
WR-PWN	Pride of the West Mine	7/27/2016	91	J	10	U	10.7		6.8	J	251		314		169	J	0.16	J+	303	
WR-PWS (10 Sieve)		7/27/2016	100	J	10	U	7.5		17.2	J	340		295		276	J	0.11	J+	330	
WR-PWS (60 Sieve)		7/27/2016	384		10	U	10.9		21.5	J	849		474		339	J	0.16	J+	576	

Notes:

J - Indicates an estimated value. The associated numerical value is the approximate concentration of the analyte in the sample

J- - Indicates an estimated value. The associated numerical value is the approximate concentration of the analyte in the sample, likely to have a low bias

J+ - Indicates an estimated value. The associated numerical value is the approximate concentration of the analyte in the sample, likely to have a high bias

U - Indicates compound was analyzed for, but not detected in sample. Value listed is quantitation limit of method

UJ - The analyte was analyzed for, but was not detected. The reported value is approximate and may be inaccurate or imprecise

"U" samples are shown as their respective method reporting limit

µg/L - micrograms per liter

T - total recoverable

"--" - no data available

SPLP - synthetic precipitation leachate procedure

\*Although the metals results shown in this table are for total metals, the provided standards for dissolved metals are discussed in this report as a guideline for analysis and consistency to the surface water discussions

NA - not applicable

"10-sieve" - soil sample was passed through a number 10 sieve

"60-sieve" - soil sample was passed through a number 60 sieve

- sample exceeds WQCC acute criteria

- sample exceeds WQCC chronic criteria



**Table 4-4**  
**Total Recoverable Metals Concentrations for 2015 and 2016 EPA/ESAT Waste Rock and Soil Samples**  
**Bonita Peak Mining District, San Juan County, Colorado**  
**Preliminary Remedial Investigation Report**

Sample Location	Mine Location	Waste Rock/Soil Sample Location	Sample Date	Aluminum (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Iron (mg/kg)	Lead (mg/kg)	Manganese (mg/kg)	Mercury (mg/kg)	Zinc (mg/kg)							
Human Health Risk-Based Levels - Campground Soils <sup>A</sup>					122				2,081										
Human Health Risk-Based Levels - Waste Rock <sup>A</sup>					1,419														
Mineral Creek																			
WR-M02B	Longfellow Mine	Longfellow Mine Waste Rock	7/28/2016	5920	J 3160		4.8	J-	669		45700	J 3680		528	J 0.56		1340		
WR-M02D	Junction Mine	Junction Mine Waste Rock	7/28/2016	8630	J 1720		5.4	J-	487		75900	J 10200		388	J 7.6		1980		
WR-M02C	Koehler Tunnel	Koehler Tunnel Waste Rock (10 sieve)	7/28/2016	6300	J 13700		3.3	J-	539		160000	J 3740		1700	J 3		910		
WR-M02C		Koehler Tunnel Waste Rock (60 sieve)	7/28/2016	7250	J 22200		5	UJ	470		203000	J 2930		1330	J 1.8		911		
M02E		Junction Mine / Koehler Tunnel Pond	10/7/2016	11700		125		2.5		175		28200		217		668		405	
M02		Junction Mine / Koehler Tunnel Downstream	10/7/2016	20400		14.6		0.056	U	30.2		33900		53.7		981		0.092	J 135
WR-M12	Brooklyn Mine	Brooklyn Mine Adit Waste Rock	7/28/2016	7610	J 86.4		0.18	J-	47.4		47200	J 1920		571	J 0.14		145		
WR1-M12		Brooklyn Mine Waste Rock #1	7/28/2016	6060		72.5		1.8	J	123		51400		2950	J 422		903		
WR2-M12		Brooklyn Mine Waste Rock #2	7/28/2016	11600		137		0.51	J	117		65100		1310	J 847		0.0034	U 311	
M12C		Brooklyn Adit	9/30/2016	10400		103	J 0.052	U	99.2	J 56200		3370		456		1.2	J+ 763	J	
M12D		Brooklyn Drainage Channel	9/30/2016	6960		39.6	J 1.1		28.8	J 48500		405		1750		0.067	J+ 314	J	
M12E		Brooklyn Drainage Channel	10/7/2016	22600		7.2		0.048	U	23		41900		100		1900		0.011	J 186
M12A		Brooklyn Drainage Channel Downstream	9/30/2016	9880	J 36.8	J 0.057	U	24.5		32300	J 62.5		764		0.035	J 88.3	J		
M12B		Brooklyn Mine Upstream in Browns Gulch	9/30/2016	8260	J 34.5	J 0.049	UJ	15.9		27400	J 48.1		251		0.05	J 55.6	J		
M12		Brooklyn Mine Downstream in Browns Gulch	9/29/2016	15700	J 16.4	J 1.9	J- 56.3		40900	J 241		3520		0.075	J 446	J			
WR1-M24	Bandora Mine	Bandora Mine Waste Rock #1	7/28/2016	6580		85		86.3	J	1410		50200		14700	J 15700		0.37		12800
WR2-M24		Bandora Mine Waste Rock #2	7/28/2016	8160		108		10.7	J	1710		64700		24400	J 1040		0.49		11100
WR3-M24		Bandora Mine Waste Rock #3	7/28/2016	4640		150		147	J	1610		23500		23200	J 15100		0.71		66800
WR4-M24		Bandora Mine Waste Rock #4	7/28/2016	12700		33.9		160	J	2790		126000		2450	J 72100		0.0049	U 16600	
M24D		Bandora Mine Drainage into South Fork	9/27/2016	21300		8.9		21.1		197		31300	J 349		6020	J 0.039	J 4120		
M23		Bandora Mine Upstream	9/27/2016	14600		4		0.21	J	13.9		23700	J 19		380	J 0.026	J 88.7		
M25		Bandora Mine Downstream	9/27/2016	18200		27.9		1.1		12		17300	J 55.3		709	J 0.039	J 174		
Cement Creek																			
WR-CC01C	Grand Mogul Mine	Grand Mogul Mine Waste Rock 1	7/27/2016	4970		106		15.2	J	2050		40800		19900	J 977		1.4		17900
WR-CC01C2		Grand Mogul Mine Waste Rock 2	7/27/2016	3550		81		20.1	J	758		30800		12800	J 670		1.5		14700
WR-CC02A		Grand Mogul Mine Western Waste Rock	7/27/2016	4390	J 72.9		4.7	J-	225		24300	J 5140		382	J 0.45		3510		
CC01F		Grand Mogul Mine Upstream	9/28/2016	12300		23	J 0.054	U	59.5	J 27200		462	J 1670		0.062	J+ 173	J		
CC01C		Grand Mogul Mine below Waste Rock 1	9/28/2016	10400		41.4	J 0.91		191	J 32700		1150	J 1560		0.31	J+ 280	J		
CC01C1		Grand Mogul Mine below Waste Rock 2	9/28/2016	11400		36.6	J 3.9		192	J 26000		1080	J 2460		0.1	J+ 737	J		
CC01C2		Grand Mogul Mine before Confluence with CC	9/28/2016	25300		36.3	J 54.5		995	J 33600		1650	J 35900		0.041	J+ 5560	J		
CC01H		Grand Mogul Mine after Confluence with CC	9/27/2016	16800		41.3	J 6.5		549	J 34000		896	J 6960		0.059	J+ 629	J		
CC02I		Grand Mogul Western Waste Rock Channel	9/27/2016	15000	J 28.4		3.2	J	131		36100	J 930		3910		0.055	J 567		
CC01U		Grand Mogul Mine Downstream in CC	9/27/2016	13000	J 50.5		2.5	J	241		39400	J 711		4130		0.038	J 642		
WR-CC14A	Natalie/Occidental Mine	Natalie/Occidental Mine Waste Rock 1	7/27/2016	11200	J 28.9		0.15	J-	48.3		38300	J 484		614	J 0.0033	U 310			
WR-CC14B		Natalie/Occidental Mine Waste Rock 2	7/27/2016	7390	J 35.9		0.29	J-	71.4		59800	J 845		712	J 0.18		223		
CC15		Natalie/Occidental Mine Upstream	9/29/2016	9570	J 14.8	J- 0.049	U	25.2	J 41900	J 78.6	J 453	J 0.012	J 53.7	J					
CC15A		Natalie/Occidental Mine Downstream	9/29/2016	8220	J 20.5	J- 0.049	U	29.9	J 37700	J 259	J 359	J 0.027	J 146	J					

**Table 4-4**  
**Total Recoverable Metals Concentrations for 2015 and 2016 EPA/ESAT Waste Rock and Soil Samples**  
**Bonita Peak Mining District, San Juan County, Colorado**  
**Preliminary Remedial Investigation Report**

Sample Location	Mine Location	Waste Rock/Soil Sample Location	Sample Date	Aluminum (mg/kg)		Arsenic (mg/kg)		Cadmium (mg/kg)		Copper (mg/kg)		Iron (mg/kg)		Lead (mg/kg)		Manganese (mg/kg)		Mercury (mg/kg)		Zinc (mg/kg)	
Human Health Risk-Based Levels - Campground Soils <sup>A</sup>						122								2,081							
Human Health Risk-Based Levels - Waste Rock <sup>A</sup>						1,419															
WR-CC22	Henrietta Mine	Henrietta Mine Waste Rock	7/27/2016	7330	J	109		5.2	J-	264		27200	J	6700		366	J	0.31		4320	
CC22D		Henrietta Mine Upstream	9/29/2016	6880	J	63.3	J	3.5	J	61.4	J	42100	J	568	J	289	J	0.096	J	898	J
CC22B		Henrietta Mine Midpoint	9/29/2016	8670	J	77.5	J	0.84		46.7	J	46500	J	617		204	J	0.12		352	
CC24B		Henrietta Mine Downstream	9/29/2016	5430	J	59.8	J	0.053	U	28	J	26900	J	165	J	190	J	0.028	J	35	J
WR-CC29	Mammoth Tunnel	Mammoth Tunnel Waste Rock	--	--		--		--		--		--		--		--		--		--	
WR-CC37	Anglo Saxon Mine	Anglo Saxon Mine Lower Waste Rock (10 sieve)	7/27/2016	10400	J	41.8		0.42	J-	71.4		87200	J	785		3780	J	0.0035	U	283	
WR-CC37		Anglo Saxon Mine Lower Waste Rock (60 sieve)	7/27/2016	11200	J	45		0.53	J-	96.1		122000	J	959		3810	J	0.12		414	
WR-CC38B		Anglo Saxon Mine Upper Waste Rock (10 sieve)	7/27/2016	4230	J	143		4.3	J-	283		61000	J	3340		300	J	0.42		1650	
WR-CC38B		Anglo Saxon Mine Upper Waste Rock (60 sieve)	7/27/2016	4850	J	232		2.3	J-	485		77400	J	4650		177	J	0.56		2240	
CC39B		Anglo Saxon Mine Upstream	9/28/2016	9290	J	42.8	J	2.7		122	J	70500	J	626		764	J	0.042	J	904	J
CC38C		Anglo Saxon Mine In Porcupine Gulch	9/28/2016	11200	J	73.5	J	1.7		93.9	J	40500	J	1480		1150	J	0.031	J	546	J
CC38D		Anglo Saxon Mine In Porcupine Gulch	9/28/2016	9870	J	48.8	J	3.7		76.5	J	42700	J	890		926	J	0.073	J	638	J
CC38		Anglo Saxon Mine In Porcupine Gulch	9/28/2016	11000	J	46.3	J	0.66		54.3	J	40300	J	540		585	J	0.047	J	285	J
CC39		Anglo Saxon Mine Downstream	9/27/2016	9170	J	36.4	J	1		61.7	J	57400	J	414		650	J	0.02	J	577	J
WR-CC43	Yukon Tunnel	Yukon Tunnel Waste Rock	7/27/2016	9750	J	51.8		3.5	J-	2580		69800	J	3160		711	J	0.26		844	
CC41		Yukon Tunnel Upstream	9/27/2016	9410	J	45.2	J	2.1		77.9	J	56600	J	621		575	J	0.041	J	502	J
CC43E		Yukon Tunnel Downstream	9/27/2016	8380	J	57.2	J	0.82		48.9	J	53100	J	343		583	J	0.032	J	765	J
CC42		Yukon Tunnel in Illinois Gulch	9/27/2016	8230	J	7.3	J	0.47	J	58.2	J	27200	J	422		385	J	0.29		101	J
CC43D		Yukon Tunnel Pond	9/27/2016	14800	J	31.8	J	0.29	J	93.3	J	65700	J	205		960	J	0.028	J	177	J
Animas River																					
A07E	Boston Mine	Boston Mine Upstream	10/5/2016	13600	J	114		3.3		175	J	106000	J	505	J	7540	J	0.054	J	434	J
WR-BSN		Boston Mine Waste Rock	7/26/2016	3270		245		15.8	J	81.8		25900		4660	J	122		1.7		4450	
A07D		Boston Mine Downstream	10/5/2016	21700	J	59.2		3.2		59.2	J	23000	J	487	J	2710	J	0.051	J	818	J
WR1-LND	London Mine	London Mine Waste Rock 1	7/26/2016	3240		94		17.8	J	166		28900		3300	J	161		0.6		2250	
WR2-LND		London Mine Waste Rock 2	7/26/2016	4980		169		33.3	J	143		25000		5490	J	713		0.53		7690	
AE18		London Mine Waste Rock 3	8/5/2015	1130	J	119	J	34.7	J	197	J	14600	J	5660	J	107	J	0.66		9680	J
A07B		London Mine Downstream	9/30/2016	48300		34.7		7		208		36800		561		10700		0.056	J	546	J
WR-BB	Ben Butler Mine	Ben Butler Mine Waste Rock	7/26/2016	6720		207		29.3	J	435		35500		24000	J	194		0.77		20200	
BB2		Ben Butler Mine Downstream	10/5/2016	14700	J	60.1		0.99		21.9	J	22900	J	473	J	910	J	0.028	J	328	J
AE1	Mountain Queen Mine	Mountain Queen Upper Shaft	8/5/2015	1920	J	227	J	95.8	J	664	J	32000	J	35700	J	54.3	J	1.5		12400	J
AE2		Mountain Queen Adit	8/5/2015	1010	J	106	J	2.5	J	117	J	15700	J	1950	J	258	J	1.8		621	J
AE9A	Vermillion Mine	Vermillion Mine Waste Rock	7/27/2016	2610		147		23.8	J	213		25800		10400	J	60.4		1.1		8520	
CG6		Vermillion Mine Downstream	9/30/2016	25400		29.9	J	1.6	J	156	J-	40100	J	162		7020	J	0.038	J	813	
AE44	Sunbank Group Mine	Sunbank Group Mine Upper Adit	8/6/2015	5310	J	148	J	1.1	J	422	J	47500	J	2040	J	3080	J	0.2		496	J
AE45		Sunbank Group Mine	8/6/2015	6350	J	109	J	2.7	J	270	J	55100	J	2210	J	8240	J	0.24		640	J
AE46		Sunbank Group Mine Waste Rock	8/6/2015	7580	J	170	J	0.68	J	246	J	102000	J	631	J	12800	J	0.26		295	J
A22		Sunbank Group Mine Upstream	9/30/2016	21200		44.8	J	9.8	J	318	J-	24000	J	1500		19600	J	0.16		1600	
A21		Sunbank Group Mine Downstream	9/30/2016	17000		79.3		5.7		518		37000		3390		4270		0.86		1460	J



Table 4-4  
Total Recoverable Metals Concentrations for 2015 and 2016 EPA/ESAT Waste Rock and Soil Samples  
Bonita Peak Mining District, San Juan County, Colorado  
Preliminary Remedial Investigation Report

Sample Location	Mine Location	Waste Rock/Soil Sample Location	Sample Date	Aluminum (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Iron (mg/kg)	Lead (mg/kg)	Manganese (mg/kg)	Mercury (mg/kg)	Zinc (mg/kg)
Human Health Risk-Based Levels - Campground Soils <sup>A</sup>					122				2,081			
Human Health Risk-Based Levels - Waste Rock <sup>A</sup>					1,419							
AE10	Frisco/Bagley Tunnel	Bagley Tunnel Waste Rock - North	8/5/2015	2910	J 174	J 10	J 337	J 33800	J 7040	J 4040	J 1.2	J 1980
AE10A		Bagley Tunnel Waste Rock - South	8/5/2015	3810	J 150	J 14.9	J 143	J 37600	J 3400	J 2640	J 0.82	J 3200
A13		Bagley Tunnel Upstream	9/30/2016	15800	J 41.2	J 15.9	J 466	J- 28900	J 6000	J 14800	J 2.6	J 2100
CG9		Bagley Tunnel Downstream	9/30/2016	16900	J 176	J 216	J 2890	J- 69700	J 1730	J 55900	J 0.2	J 30200
GC-OPP		Bagley Tunnel - North of Mine	7/27/2016	17800	J 30.4	J- 0.98	J 26.9	J 23700	J 151	J 1700	J 0.0036	J 327
AE13	Columbus Mine	Columbus Mine Waste Rock	8/4/2015	6000	J 91.9	J 6.4	J 512	J 41700	J 6060	J 1160	J 0.74	J 1750
CG11		Columbus Mine Upstream	9/30/2016	15500	J 41.7	J 5.9	J 182	J- 29300	J 1300	J 6080	J 1.2	J 857
A10		Columbus Mine Downstream	9/29/2016	12800	J 60.2	J 1.3	J 141	J+ 40500	J 1870	J 2350	J 0.64	J 404
CMP7	Campground 7	Campground 7	7/26/2016	13300	J 86.9	J- 10.6	J 339	J 23500	J 11800	J 1560	J 0.29	J 5290
AE32A	Silver Wing Mine	Silver Wing Mine	8/4/2015	1480	J 702	J 10.5	J 3830	J 43400	J 7010	J 357	J 0.17	J 1340
AE32b		Silver Wing Mine	8/4/2015	1310	J 729	J 8.6	J 2530	J 38600	J 4710	J 289	J 0.51	J 1970
WR-TM	Tom Moore Mine	Tom Moore Mine	7/27/2016	4690	J 361	J 7.6	J 106	J 42400	J 8180	J 837	J 0.14	J 3080
BE4	Ben Franklin Mine	Ben Franklin Mine	8/4/2015	3610	J 57.3	J 6.4	J 475	J 49100	J 6770	J 1130	J 0.47	J 2870
EG3A		Ben Franklin Mine Upstream	9/29/2016	17300	J 17.4	J 0.71	J 96.9	J+ 55600	J 605	J 1620	J 0.23	J 282
EG5		Ben Franklin Mine Downstream	9/28/2016	18100	J 42.4	J 4.9	J 192	J 65400	J 730	J 5830	J 0.046	J 1050
A39	Terry Tunnel	Terry Tunnel Upstream	9/28/2016	17700	J 18.6	J 12.2	J 456	J 60100	J 1010	J 9450	J 0.055	J 3640
EG6		Terry Tunnel Downstream	9/28/2016	16000	J 31.7	J 11	J 439	J 67000	J 1770	J 15100	J 0.11	J 3450
WR-PWN	Pride of the West Mine	Pride of the West Mine North	7/27/2016	7420	J 27.8	J 39.7	J 906	J 25200	J 13900	J 5450	J 0.0033	J 9920
WR-PWS		Pride of the West Mine South (10 sieve)	7/27/2016	9090	J 85.7	J 46.8	J 1640	J 42700	J 16300	J 5860	J 0.27	J 12100
WR-PWS		Pride of the West Mine South (60 sieve)	7/27/2016	10300	J 113	J 54.9	J 1540	J 50600	J 26700	J 6580	J 0.55	J 13100
CU4		Pride of the West Upstream	9/28/2016	10500	J 23.4	J 2.2	J 105	J 21800	J 1760	J 2210	J 0.015	J 665
CU4A		Pride of the West Downstream	9/28/2016	13000	J 9.2	J 2	J 47.2	J 30200	J 820	J 1260	J 0.012	J 458
CMP4	Campground 4	Campground 4	7/26/2016	8550	J 62.9	J- 94.3	J 2510	J 37400	J 44200	J 910	J 6	J 17300

Notes:

Waste rock samples are indicated by a "WR" in the sample location name

CC - Cement Creek

U - Indicates compound was analyzed for, but not detected in sample

UJ - The analyte was analyzed for, but was not detected. The reported value is approximate and may be inaccurate or imprecise

J - Indicates an estimated value. The associated numerical value is the approximate concentration of the analyte in the sample

J- - Indicates an estimated value. The associated numerical value is the approximate concentration of the analyte in the sample, likely to have a low bias

A - human health risk-based levels are presented and discussed in Appendix B of the Focused Feasibility Study.

mg/kg - milligrams per kilogram

"--" - no data available

"U" samples are reported as the method detection limit

- level exceeds the lead human health risk-based value of 2,081 mg/kg for campgrounds. See Appendix B of the Focused Feasibility Study.
- level exceeds the arsenic human health risk-based value of 122 mg/kg for campgrounds. See Appendix B of the Focused Feasibility Study.
- level exceeds the arsenic human health risk-based value of 1,419 mg/kg for waste rock. See Appendix B of the Focused Feasibility Study.

**Table 4-5**  
**Metals Concentrations for 2016 EPA/ESAT Sediment Samples**  
**Bonita Peak Mining District, San Juan County, Colorado**  
**Preliminary Remedial Investigation Report**

Sample Location	Mine Location	Sample Location	Sample Date	Aluminum (mg/kg)		Arsenic (mg/kg)		Cadmium (mg/kg)		Copper (mg/kg)		Iron (mg/kg)		Lead (mg/kg)		Manganese (mg/kg)		Mercury (mg/kg)		Zinc (mg/kg)	
Sediments Ecological Risk-Based Screening Levels				26000		9.79		0.99		31.6		188400		35.8		631		0.18		121	
Mineral Creek																					
M02E	Junction Mine	Junction Mine / Koehler Tunnel Pond	10/7/2016	8150		3080		12.4		972		184000		458		257		0.35		1700	
M12C	Brooklyn Mine	Brooklyn Mine Adit Discharge	9/30/2016	6850		62.6		0.059	U	52.8		38500		2950		299		0.66		228	
M12B		Brooklyn Mine Upstream in Browns Gulch	9/30/2016	12100		60.1		0.7		40.7		40000		126		662		0.033	J	184	
M12		Brooklyn Mine Downstream in Browns Gulch	9/29/2016	12900		25.6		0.32	J	27.5		39700		115		535		0.039	J	102	
M12E		Brooklyn Mine Discharge Channel 1	10/7/2016	2020		279		0.039	U	102		390000		101		320		0.018	J	139	
M12D		Brooklyn Mine Discharge Channel 2	9/30/2016	37200		113		1.7		140		109000		1340		5390		0.0085	U	892	
M12A		Brooklyn Mine Discharge Channel 3	9/30/2016	9870		49.5		0.13	J	31		41100		51.4		474		0.043	J	71.9	
M23	Bandora Mine	Bandora Mine Upstream	9/27/2016	8490		5.1		0.23	J	18.1		18500		9.4		631		0.0043	U	109	
M25		Bandora Mine Downstream	9/27/2016	12900		5.8		2.1		46.5		19700		36.1		559		0.0045	U	402	
Cement Creek																					
CC01C	Grand Mogul Mine	Grand Mogul Mine at toe of Waste Rock	9/28/2016	4310		458		0.99		168		198000		612		2750		0.11	J	333	
CC01C1		Grand Mogul Mine at toe of Waste Rock	9/28/2016	4210		455		1.3		202		59600		959		10700		0.079	J	348	
CC01C2		Grand Mogul Mine upstream of Cement Creek	9/28/2016	18700		386		49.8		1230		79600		2070		42300		0.043	J	3770	
CC01F		Upstream of Grand Mogul Mine	9/28/2016	13400		27.1		10.9		1200		32000		1400		5770		0.026	J	2550	
CC01H		Cement Creek after Confluence with Grand Mogul East Drainage Channel	9/27/2016	13000		39.6		5		710		34800		1240		5150		0.041	J	1150	
CC02I		Grand Mogul Western Waste Rock Drainage Channel	9/27/2016	11000		51		1.3	J	132		26100		384		2710		0.0053	J	419	
CC01U		Downstream of Grand Mogul and Queen Anne in Cement Creek	9/27/2016	9910		39.1		1.5	J	131		25000		326		3610		0.013	J	471	
CC15	Natalie/Occidental Mine	Upstream of Natalie/Occidental Mine	9/29/2016	10400		11.8		0.056	U	34.2		52300		44.3		424		0.016	J	86.3	
CC15A		Downstream of Natalie/Occidental Mine	9/29/2016	8730		11.8		0.059	U	48.4		98300		93.6		444		0.011	J	111	
CC22D	Henrietta Mine	Upstream of Henrietta Mine	9/29/2016	9110		46.6		1.4		155		31800		664		353	J	0.089	J	613	
CC22B		Midpoint of Henrietta Mine	9/29/2016	12900		58.2		1.6		166		37800		807		365		0.16	J	511	
CC24B		Downstream of Henrietta Mine	9/29/2016	6400		52.2		1		47.2		40500		466		221		0.12	J	299	
CC38	Anglo Saxon Mine	Porcupine Gulch Immediately Before Cement Creek Confluence	9/28/2016	16400		156		5.5	J	482		926000		687		3870		0.044	J	6180	
CC38C		Porcupine Gulch Upstream of Anglo Saxon Mine	9/28/2016	18600		55.8		3.5		182		58800		2080		2500		0.059	J	2040	
CC38D		Porcupine Gulch Between Upper and Lower Anglo Saxon Adit	9/28/2016	9170		118		5.4		431		178000		897		2870		0.021	J	1760	
CC39		Cement Creek below Anglo Saxon Mine	9/27/2016	9010		41.6		0.98		46.1		93700		307		620		0.0044	U	299	
CC39B		Cement Creek above Anglo Saxon Mine	9/28/2016	8800		36.3		2.6		141	J	86700		359		668		0.0081	J	799	
CC41	Yukon Tunnel	Cement Creek above Yukon Tunnel	9/27/2016	7700		56.4		0.86		26.1		52000		493		345		0.043	J	312	
CC42		Illinois Gulch at mouth to Cement Creek	9/27/2016	16800		64.9		4.8		416		83800		134		18600		0.01	J	1310	
CC42F		Illinois Gulch Above Yukon Tunnel Discharge Pipe	9/27/2016	11100		11.5		0.35	J	52.1		31400		119		811		0.0044	U	142	
CC43E		Cement Creek Below Yukon Tunnel	9/27/2016	8500		75.1		1.2		38.3		70300		390		426		0.063	J	402	
Animas River																					
A07E	Boston Mine	Upstream of Boston Mine	10/5/2016	20500	J	73.2		2.2		94.3		28600	J	734		6920		0.056	J	359	
A07D		Downstream of Boston Mine	10/5/2016	18000	J	95.5		5.9		126		43900	J	884		16600		0.047	J	681	
A07B	London Mine	London Mine Downstream	9/30/2016	25200		28.1		9		126		27500		372		10100		0.029	J-	553	
A07B		London Mine Downstream	9/30/2015	27500		59.3		10.8		301		58800		889	J	16900		0.024		889	
A07B		London Mine Downstream	8/5/2015	16100	J	43.8	J	12.9	J	235	J	39400	J	760	J	14200	J	0.038	J	716	J
BB2	Ben Butler Mine	Below Ben Butler Waste Rock	10/5/2016	14500	J	88.7		11.2		397		26100	J	1130		5750		0.042	J	2640	
A19	Mountain Queen Mine	Mountain Queen Mine Upstream	8/5/2015	7460	J	62.6	J	0.88	J	114	J	36100	J	1130	J	1960	J	0.034	J	163	J
A18		Mountain Queen Mine Downstream	8/5/2015	14900	J	26.3	J	2.1	J	327	J	44400	J	195	J	1910	J	0.083	J	376	

**Table 4-5**  
**Metals Concentrations for 2016 EPA/ESAT Sediment Samples**  
**Bonita Peak Mining District, San Juan County, Colorado**  
**Preliminary Remedial Investigation Report**

Sample Location	Mine Location	Sample Location	Sample Date	Aluminum (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Copper (mg/kg)	Iron (mg/kg)	Lead (mg/kg)	Manganese (mg/kg)	Mercury (mg/kg)	Zinc (mg/kg)
<i>Sediments Ecological Risk-Based Screening Levels</i>				26000	9.79	0.99	31.6	188400	35.8	631	0.18	121
CG4	Vermillion Mine	Vermillion Mine Upstream	10/6/2016	17800	17	1.3	123	32900	77.5	5010	0.0042	U
CG4		Vermillion Mine Upstream	8/5/2015	15900	J	17.2	J	152	J	30900	J	0.016
CG6		Vermillion Mine Downstream	9/30/2016	19600		15.3	J-	106		34200		0.019
CG6		Vermillion Mine Downstream	8/5/2015	18500	J	23.3	J	177	J	34100	J	0.014
A22	Sunbank Group Mine	Sunbank Group Mine Upstream	9/30/2016	9580		82.3		446		24100		0.51
A22		Sunbank Group Mine Upstream	9/29/2015	7690	J-	46.6		771		24000		0.639
A22		Sunbank Group Mine Upstream	8/6/2015	5440	J	39.8	J	896	J	17800	J	1.1
A21		Sunbank Group Mine Downstream	9/30/2016	14400		73.2		644		29200		12.8
A21		Sunbank Group Mine Downstream	9/29/2015	26800	J-	44		1560		32600	J	0.701
A21		Sunbank Group Mine Downstream	8/6/2015	6940	J	40.1	J	911	J	18900	J	1.2
A13	Frisco/Bagley Tunnel	Bagley Tunnel Upstream	9/30/2016	15200		32.9		238		24700		0.12
A13		Bagley Tunnel Upstream	9/29/2015	20400		29		239		33200	J	0.033
A12		Bagley Tunnel Adit Drainage	9/28/2016	23700		61.6	J-	28.4		171		209000
CG9		Bagley Tunnel Downstream	9/30/2016	15700		69.3		10.4		473		36100
CG11	Columbus Mine	Columbus Mine Upstream	9/30/2016	11400		35.9		8		162		21900
A10		Columbus Mine Downstream	9/29/2016	8170		18.3		1.2		57.2		18700
A10		Columbus Mine Downstream	9/29/2015	44600		41.7		7.46		477		28400
A10		Columbus Mine Downstream	8/4/2015	10200	J	30.9	J	7	J	295	J	23300
A28	Silver Wing Mine	Silver Wing Mine Upstream	9/30/2015	10100	J-	63		12.2		280		30900
A28		Silver Wing Mine Upstream	8/4/2015	8590	J	36.2	J	5.7	J	195	J	19700
A30		Silver Wing Mine Downstream	9/30/2015	13900	J-	37.8		10.9		355		21200
A30		Silver Wing Mine Downstream	8/4/2015	9750	J	50.3	J	14.2	J	324	J	26700
A30A	Tom Moore Mine	Tom Moore Mine Upstream	9/29/2016	8750		68.1		5.2		312		26000
A30B		Tom Moore Mine Downstream	9/29/2016	9780		38.5		7.1		158		24500
EG3A	Ben Franklin Mine	Ben Franklin Mine Upstream	9/29/2016	18000		18.3		5.4		146		43300
EG3A		Ben Franklin Mine Upstream	9/29/2015	12300		17.8	J	5.18		242		44100
EG3A		Ben Franklin Mine Upstream	8/4/2015	16400	J	16.7	J	7.3	J	179	J	40600
EG5		Ben Franklin Mine Downstream	9/28/2016	14100		69.3		10.9		472		55500
EG5		Ben Franklin Mine Downstream	9/30/2015	21800		19.7	J	19.2		318		76700
EG5		Ben Franklin Mine Downstream	8/4/2015	14600	J	21.6	J	34.4	J	637	J	47800
A39	Terry Tunnel	Terry Tunnel Upstream	9/28/2016	14800		32.1		11.5		432		61200
EG6		Terry Tunnel Downstream	9/28/2016	16200		28.7		16.3		419		46800
EG6		Terry Tunnel Downstream	9/30/2015	12900		18.1	J	14.4		334		38600
EG6		Terry Tunnel Downstream	8/4/2015	14000	J	23.9	J	17.3	J	535	J	42500
CU4	Pride of the West Mine	Pride of the West Mine Upstream	9/28/2016	13900		4		0.63	J	10.5		33100
CU4A		Pride of the West Mine Downstream	9/28/2016	13400		6.8		2		20.2		29500
A50		Pride of the West Mine Adit	9/28/2016	6790		31.4		28.9		837		21400

Notes:

J - Indicates an estimated value. The associated numerical value is the approximate concentration of the analyte in the sample

U - Indicates compound was analyzed for, but not detected in sample

J- - Indicates an estimated value. The associated numerical value is the approximate concentration of the analyte in the sample, likely to have a low bias

mg/kg - milligrams per kilogram

"--" - no data available

"U" samples are reported as the method detection limit

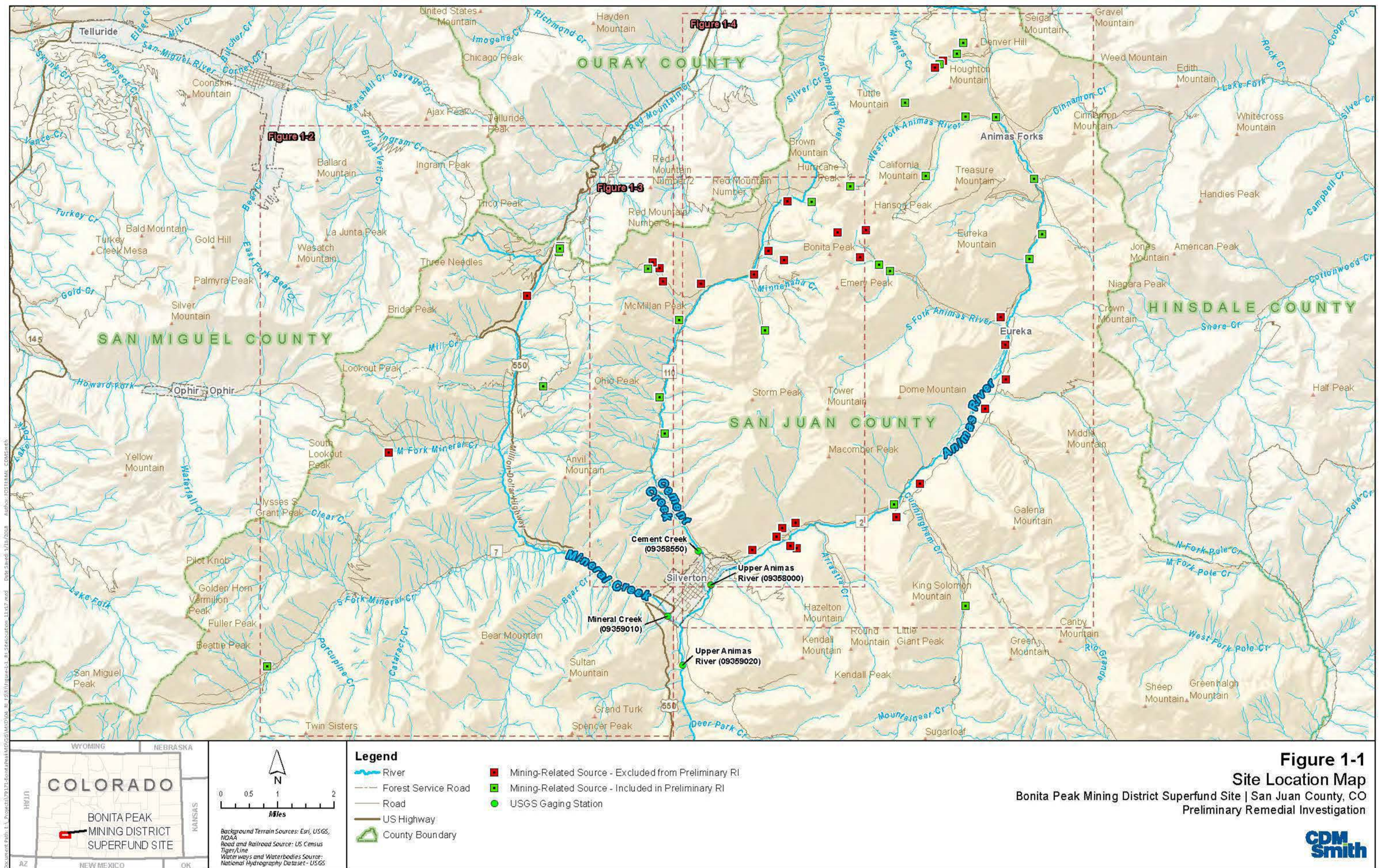
- level exceeds the ecological risk-based screening levels for sediments

## Figures

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**Legend**

- Mining-Related Source - Excluded from Preliminary RI
- Mining-Related Source - Included in Preliminary RI
- Mountain Peak
- Forest Service Road
- Road
- US Highway
- Streams

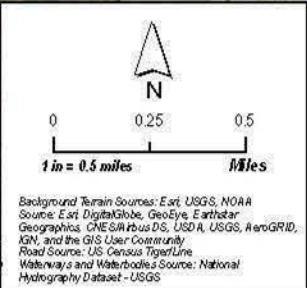
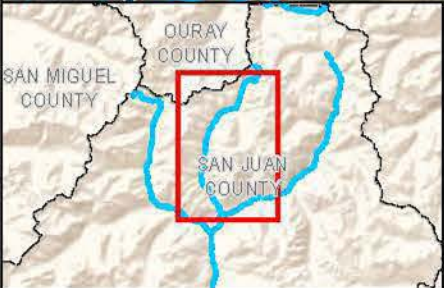
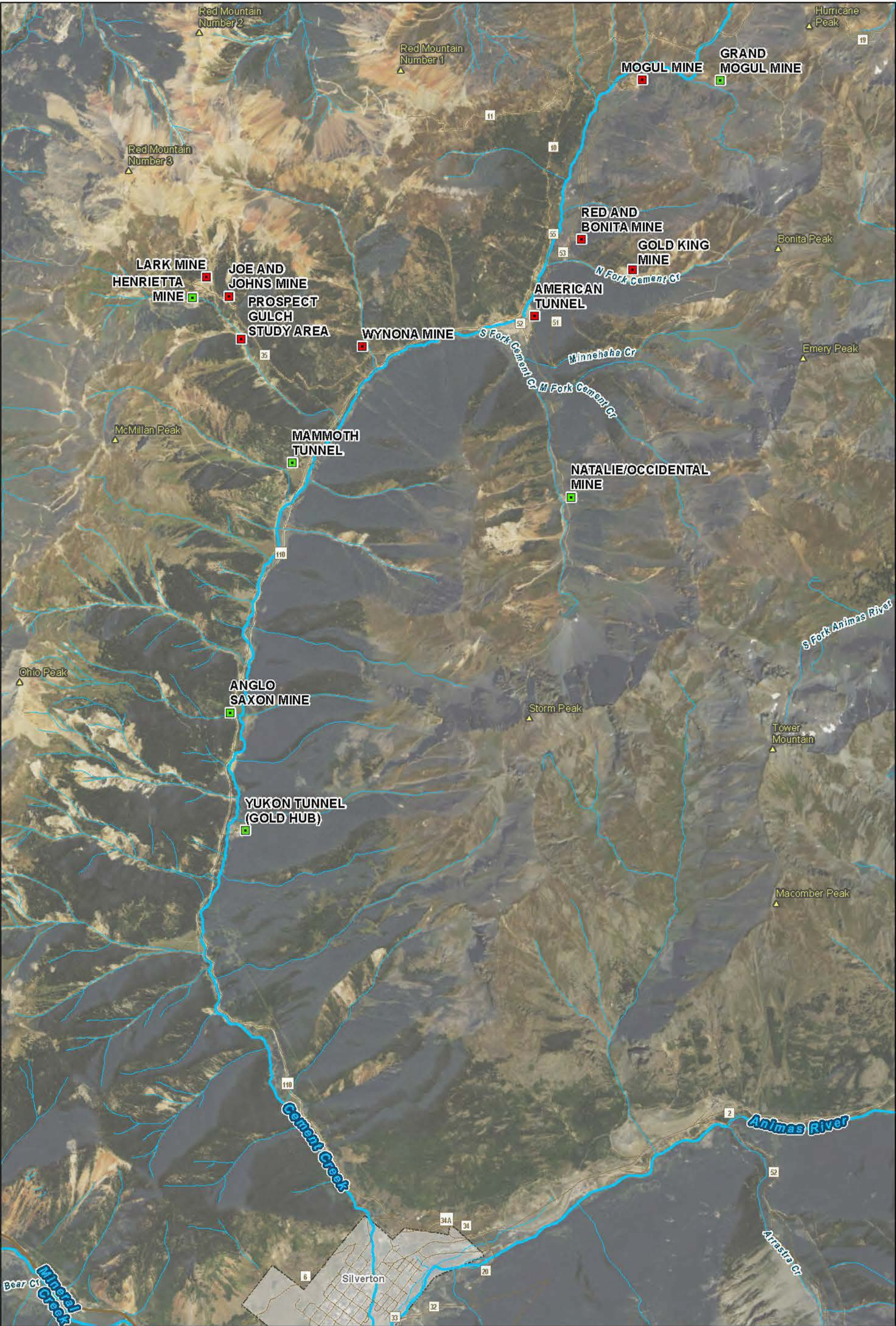
**Figure 1-2**  
Mining-Related Sources -  
Mineral Creek Drainage Basin

Bonita Peak Mining District Superfund Site | San Juan County, CO  
Preliminary Remedial Investigation



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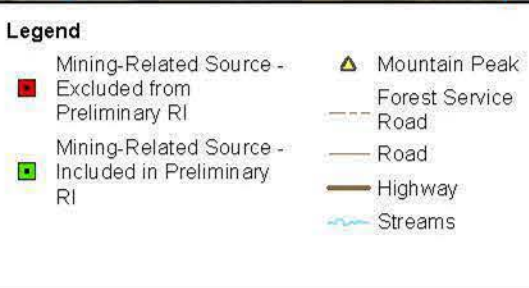
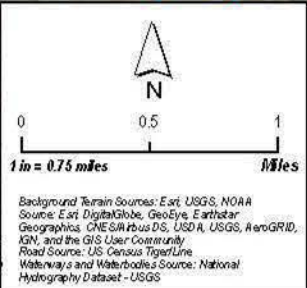
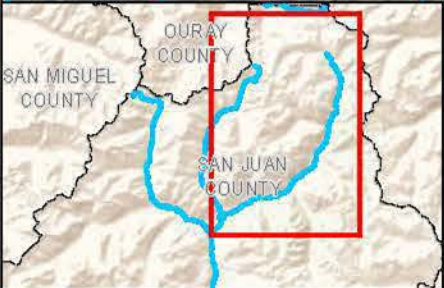
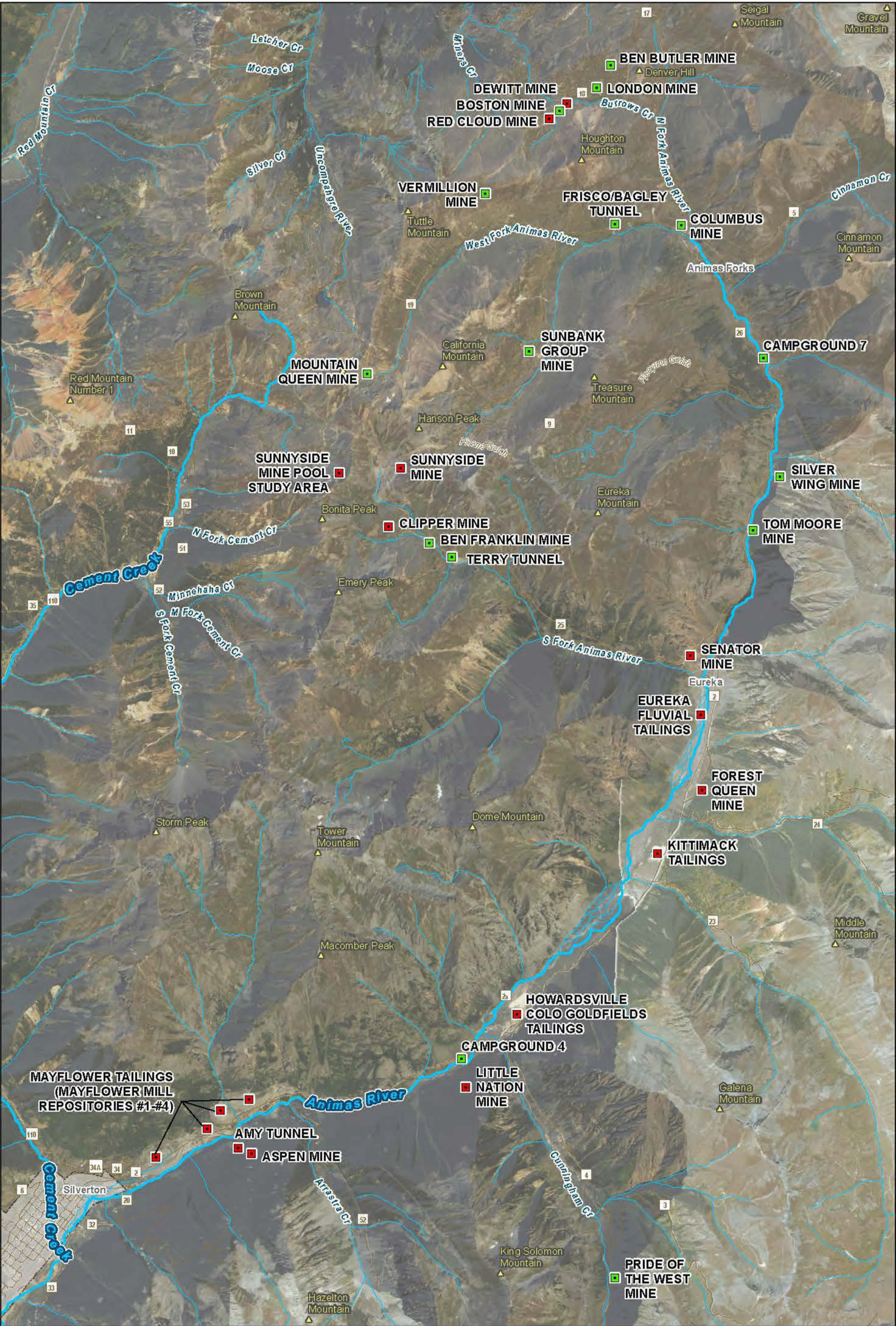




**Figure 1-3**  
**Mining-Related Sources -**  
**Cement Creek Drainage Basin**

Bonita Peak Mining District Superfund Site | San Juan County, CO  
Preliminary Remedial Investigation



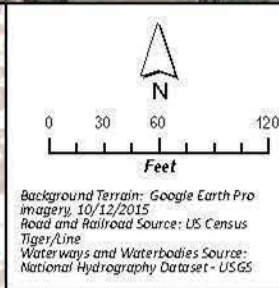


**Figure 1-4**  
**Mining-Related Sources -**  
**Upper Animas Area Drainage Basin**

Bonita Peak Mining District Superfund Site | San Juan County, CO  
Preliminary Remedial Investigation

**CDM Smith**





#### Legend

##### Samples

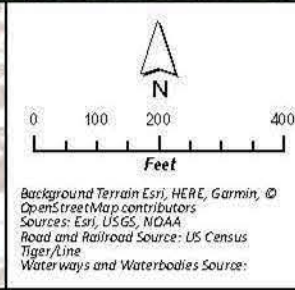
- Surface Water
- Sediment
- ▲ Waste Rock and Soil Sample

#### Note:

MIW = mining-influenced water

**Figure 4-1**  
**Longfellow Mine, Junction Mine, and Koehler Tunnel**  
 Bonita Peak Mining District Superfund Site | San Juan County, CO  
 Preliminary Remedial Investigation





**Legend**  
**Samples**

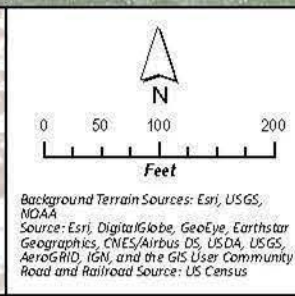
- Surface Water
- Sediment
- ▲ Waste Rock and Soil

**Note:**  
MIW = mining-influenced water

**Figure 4-2**  
**Brooklyn Mine**  
Bonita Peak Mining District Superfund Site | San Juan County, CO  
Preliminary Remedial Investigation







**Legend**

**Samples**

- Surface Water
- Sediment
- ▲ Waste Rock and Soil

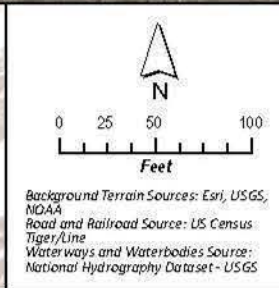
**Note:**  
MIW = mining-influenced water

**Figure 4-3**  
**Bandora Mine**  
 Bonita Peak Mining District Superfund Site | San Juan County, CO  
 Preliminary Remedial Investigation



Document Path: E:\Projects\7071\Bontapine\MapDocs\MapDocs\Bontapine\Bontapine.mxd Date Saved: 7/13/2018 Author: JOSTER.M. CDMSmith





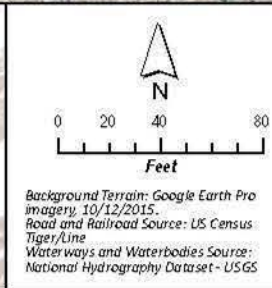
**Legend**

**Samples**

- Surface Water
- Sediment
- ▲ Waste Rock and Soil Sample

**Figure 4-4**  
**Grand Mogul Mine**  
Bonita Peak Mining District Superfund Site | San Juan County, CO  
Preliminary Remedial Investigation





#### Legend

##### Samples

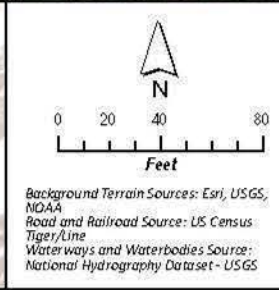
- Surface Water
- Sediment
- ▲ Waste Rock and Soil Sample

##### Note:

MIW = mining-influenced water

**Figure 4-5**  
Natalie/Occidental Mine  
Bonita Peak Mining District Superfund Site | San Juan County, CO  
Preliminary Remedial Investigation





**Legend**

**Samples**

- Surface Water
- Sediment
- ▲ Waste Rock and Soil Sample

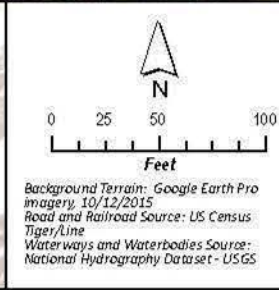
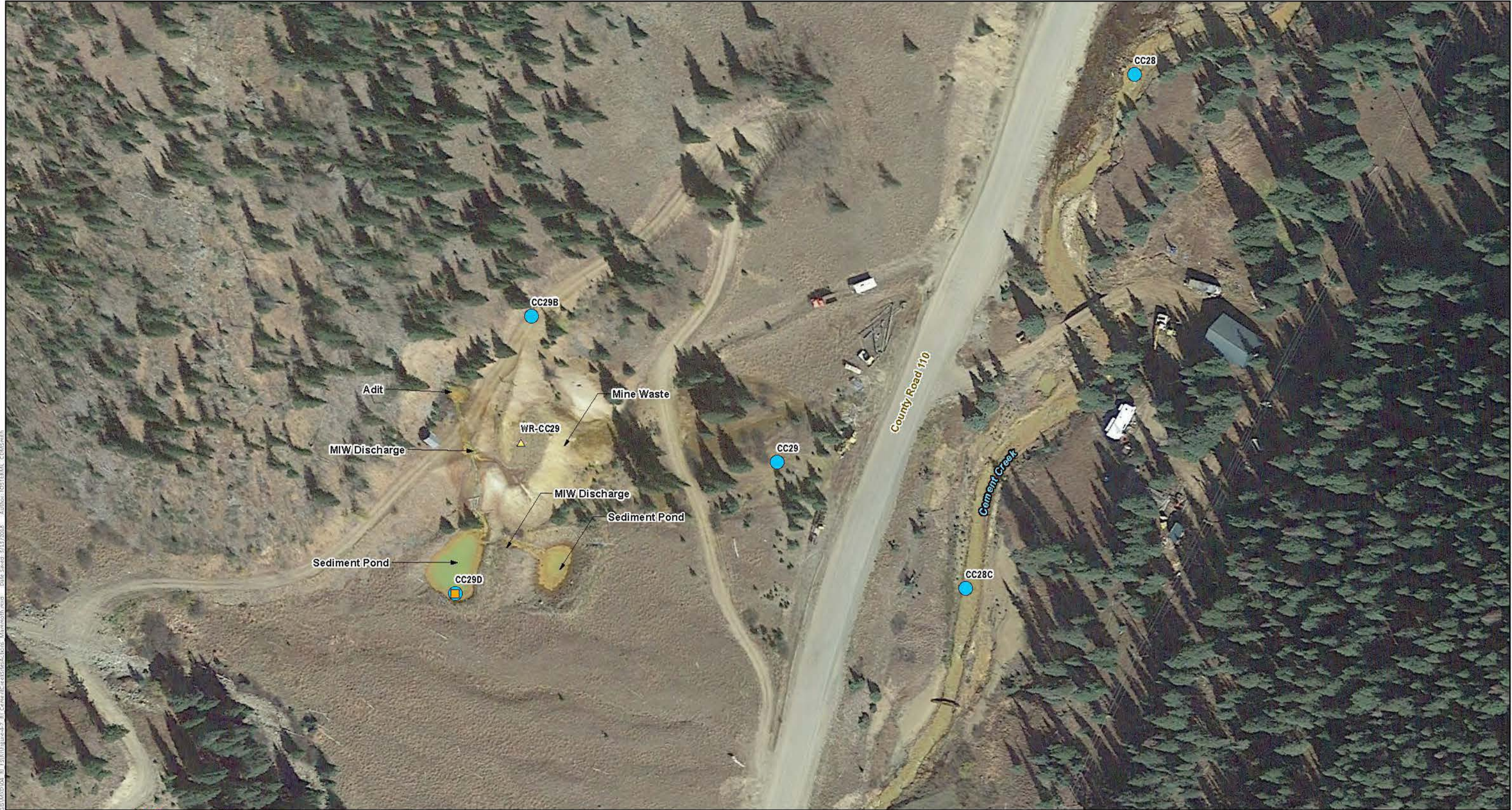
**Note:**

MIW = mining-influenced water

**Figure 4-6**  
**Henrietta Mine**  
Bonita Peak Mining District Superfund Site | San Juan County, CO  
Preliminary Remedial Investigation







**Legend**

**Samples**

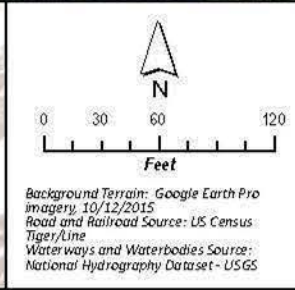
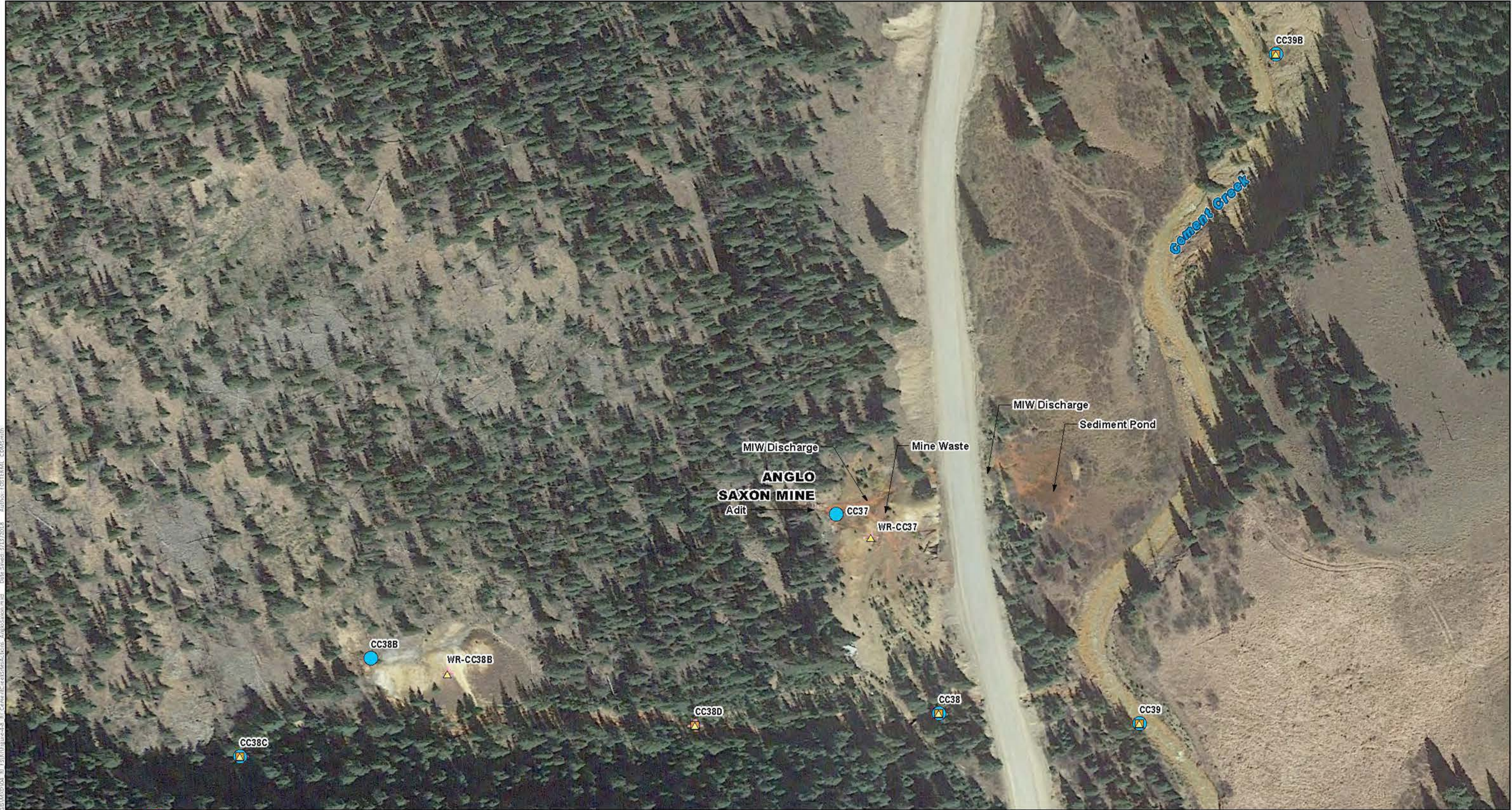
- Surface Water
- Sediment
- ▲ Waste Rock and Soil Sample

**Note:**  
MIW = mining-influenced water

**Figure 4-7**  
**Mammoth Tunnel**  
Bonita Peak Mining District Superfund Site | San Juan County, CO  
Preliminary Remedial Investigation







**Legend**

**Samples**

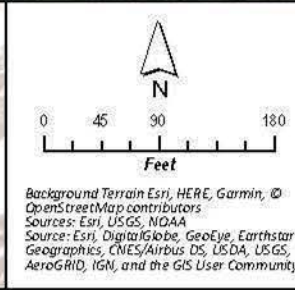
- Surface Water
- Sediment
- ▲ Waste Rock and Soil Sample

**Note:**  
MIW = mining-influenced water

**Figure 4-8**  
**Anglo Saxon Mine**  
 Bonita Peak Mining District Superfund Site | San Juan County, CO  
 Preliminary Remedial Investigation







**Legend**

**Samples**

- Surface Water
- Sediment
- ▲ Waste Rock and Soil Sample

**Note:**  
MIW = mining-influenced water

**Figure 4-9**  
**Yukon Tunnel**  
Bonita Peak Mining District Superfund Site | San Juan County, CO  
Preliminary Remedial Investigation

**CDM Smith**





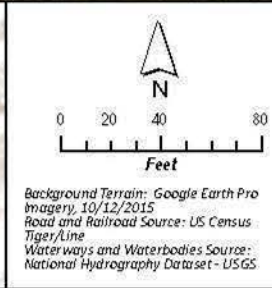
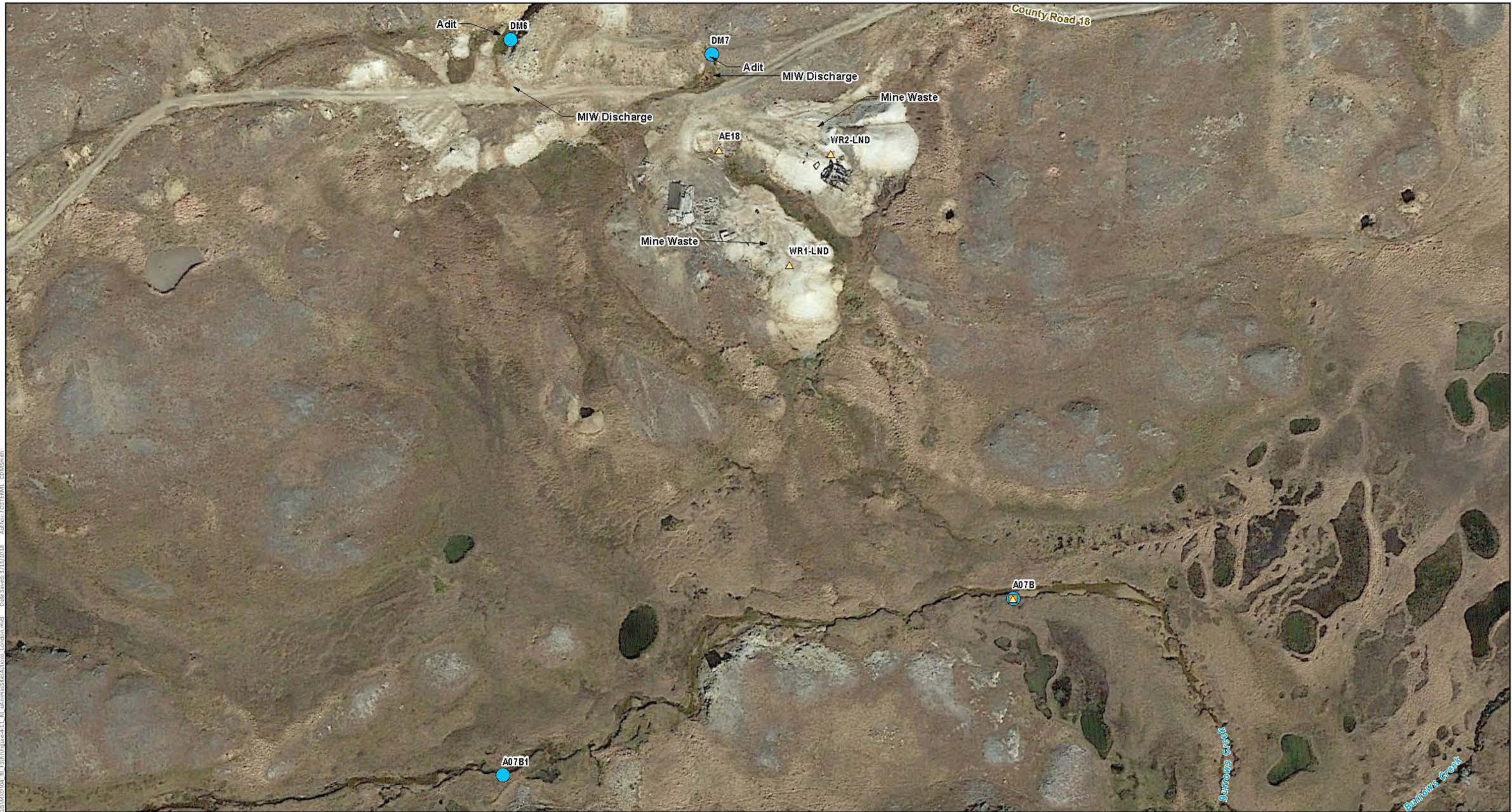
Background Terrain Sources: Esri, USGS, NOAA  
Road and Railroad Source: US Census Tiger/Line  
Waterways and Waterbodies Source: National Hydrography Dataset - USGS

- Legend**
- Samples**
- Surface Water
  - Sediment
  - ▲ Waste Rock and Soil

**Figure 4-10**  
**Boston Mine**  
Bonita Peak Mining District Superfund Site | San Juan County, CO  
Preliminary Remedial Investigation

**CDM Smith**





### Legend

#### Samples

- Surface Water
- Sediment
- ▲ Waste Rock and Soil Sample

#### Note:

MIW = mining-influenced water

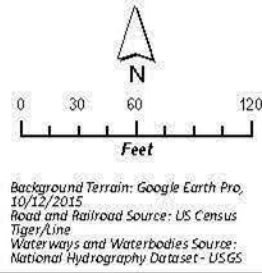
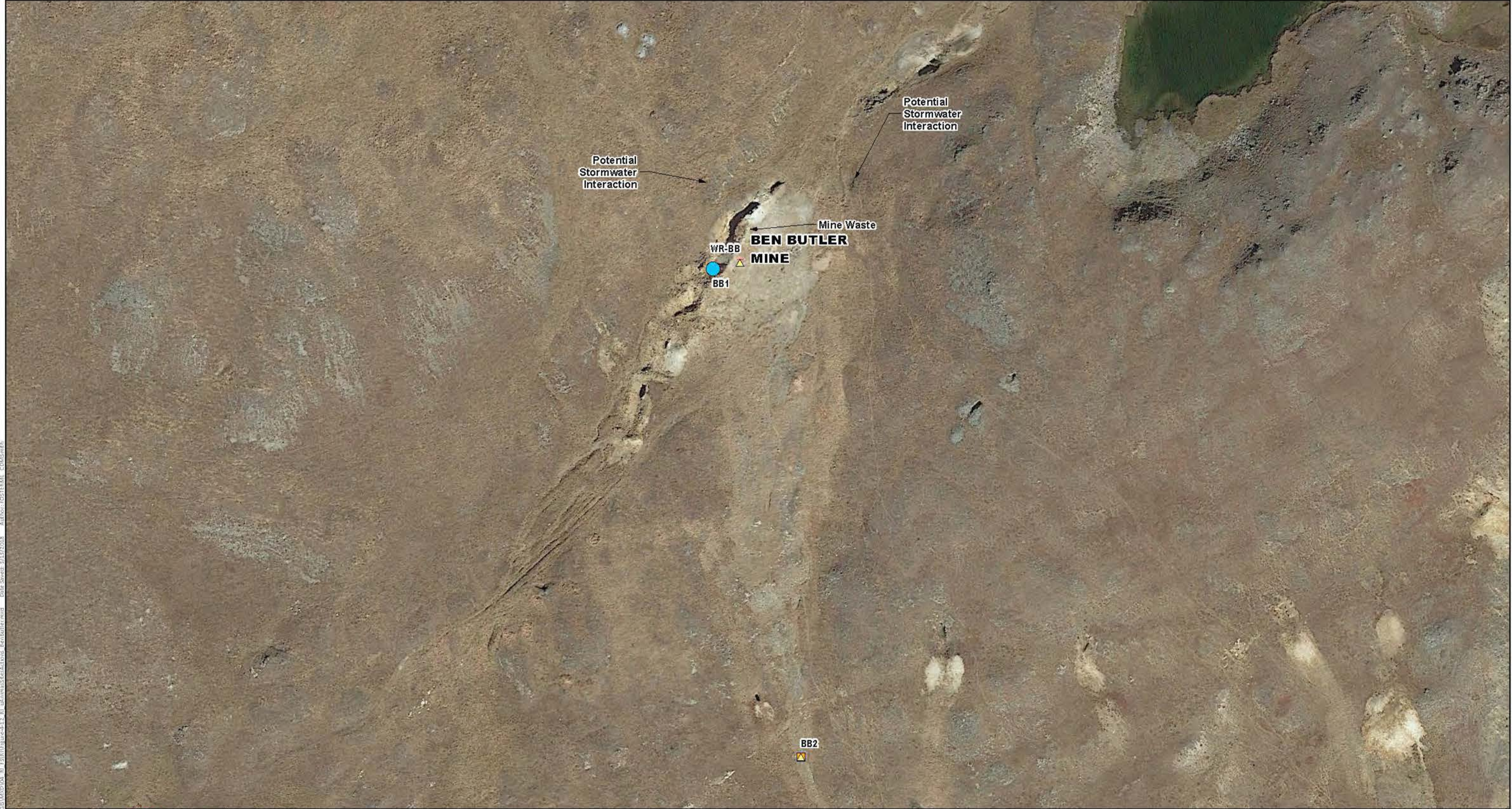
### Figure 4-11

#### London Mine

Bonita Peak Mining District Superfund Site | San Juan County, CO  
 Preliminary Remedial Investigation







- Legend**
- Samples**
- Surface Water
  - Sediment
  - ▲ Waste Rock and Soil

**Figure 4-12**  
**Ben Butler Mine**  
Bonita Peak Mining District Superfund Site | San Juan County, CO  
Preliminary Remedial Investigation







Background Terrain Sources: Esri, USGS, NOAA  
Road and Railroad Source: US Census Tiger/Line  
Waterways and Waterbodies Source: National Hydrography Dataset - USGS

#### Legend

##### Samples

- Surface Water
- Sediment
- Waste Rock and Soil

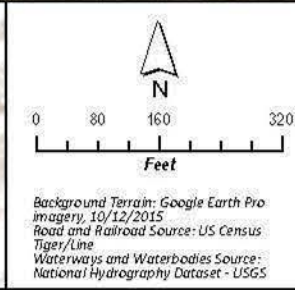
##### Note:

MIW = mining-influenced water

**Figure 4-13**  
**Mountain Queen Mine**  
Bonita Peak Mining District Superfund Site | San Juan County, CO  
Preliminary Remedial Investigation







**Legend**

**Samples**

- Surface Water
- Sediment
- ▲ Waste Rock and Soil

**Note:**

MIW = mining-influenced water

**Figure 4-14**  
**Vermillion Mine**  
Bonita Peak Mining District Superfund Site | San Juan County, CO  
Preliminary Remedial Investigation







Background Terrain: Google Earth Pro Imagery, 10/12/2015  
 Road and Railroad Source: US Census Tiger/Line  
 Waterways and Waterbodies Source: National Hydrography Dataset - USGS

#### Legend

##### Samples

- Surface Water
- Sediment
- ▲ Waste Rock and Soil Sample

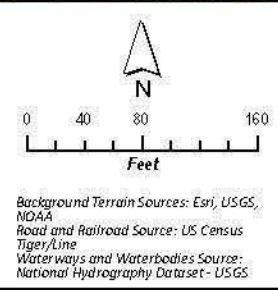
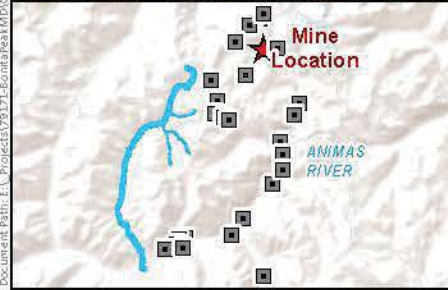
##### Note:

MIW = mining-influenced water

**Figure 4-15**  
**Sunbank Group Mine**  
 Bonita Peak Mining District Superfund Site | San Juan County, CO  
 Preliminary Remedial Investigation







**Legend**

**Samples**

- Surface Water
- Sediment
- ▲ Waste Rock and Soil

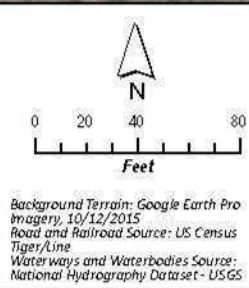
**Note:**  
 MIW = mining-influenced water

**Figure 4-16**  
**Frisco/Bagley Tunnel**  
 Bonita Peak Mining District Superfund Site | San Juan County, CO  
 Preliminary Remedial Investigation



Document Path: E:\Project\70371-Bonita Peak Mining District\GIS\MapDocs\04\_RJ\_1516\Figure-4-16\_RJ\_1516\Frisco/Bagley Tunnel.mxd Date Saved: 3/13/2018 Author: JOSTERM CDM Smith





#### Legend

##### Samples

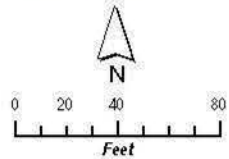
- Surface Water
- Sediment
- ▲ Waste Rock and Soil

##### Note:

MIW = mining-influenced water

**Figure 4-17**  
**Columbus Mine**  
 Bonita Peak Mining District Superfund Site | San Juan County, CO  
 Preliminary Remedial Investigation





Background Terrain: Google Earth Pro  
Imagery: 10/12/2015  
Road and Railroad Source: US Census  
Tiger/Line  
Waterways and Waterbodies Source:  
National Hydrography Dataset - USGS

#### Legend

##### Samples

- ▲ Waste Rock and Soil

#### Figure 4-18

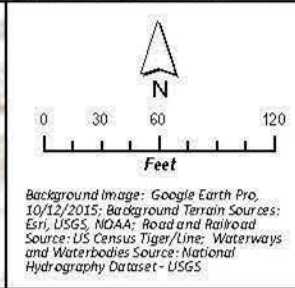
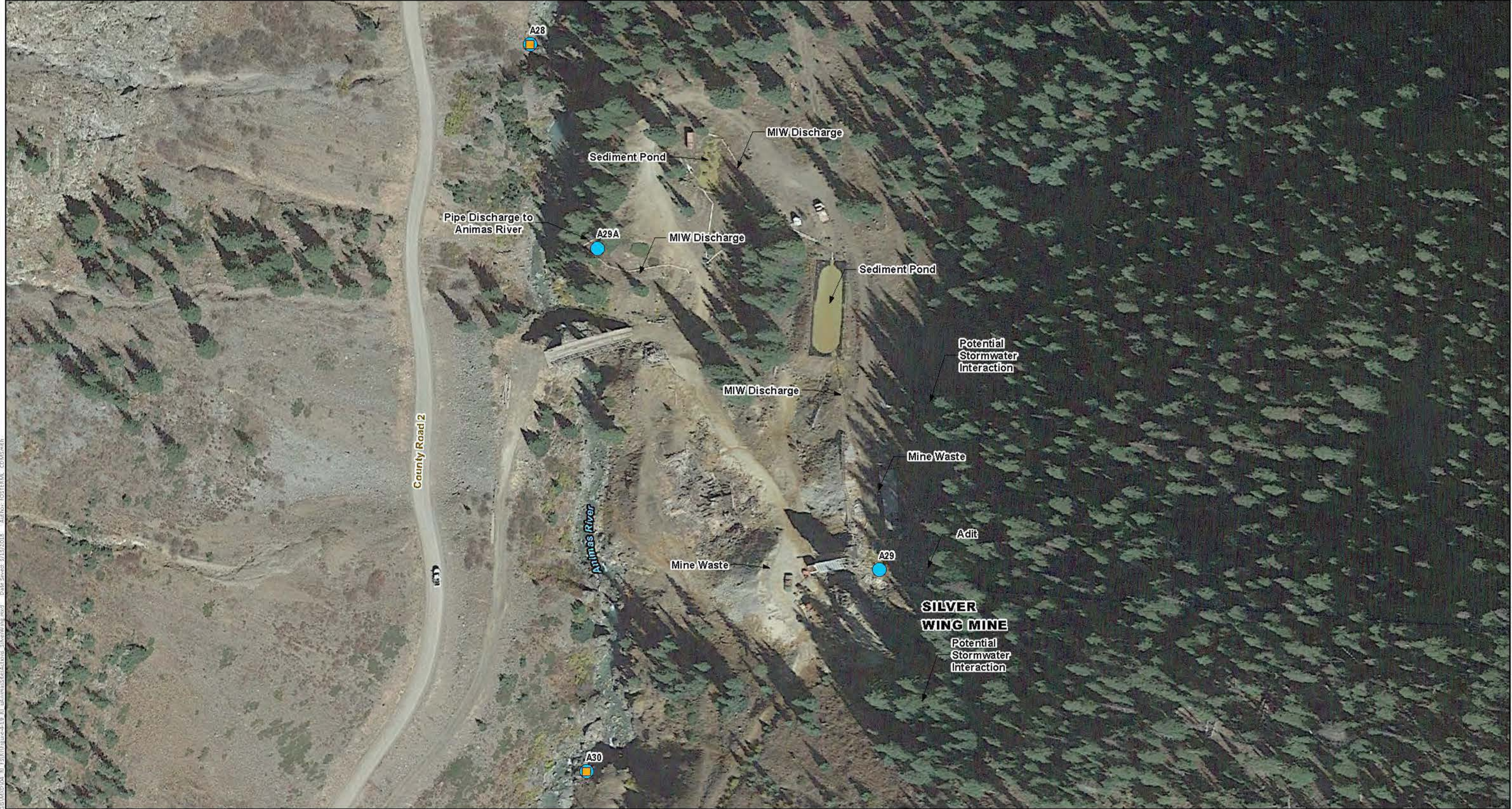
##### Campground 7

Bonita Peak Mining District Superfund Site | San Juan County, CO

Preliminary Remedial Investigation







**Legend**

**Samples**

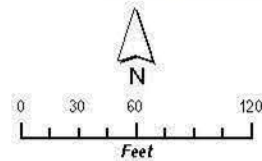
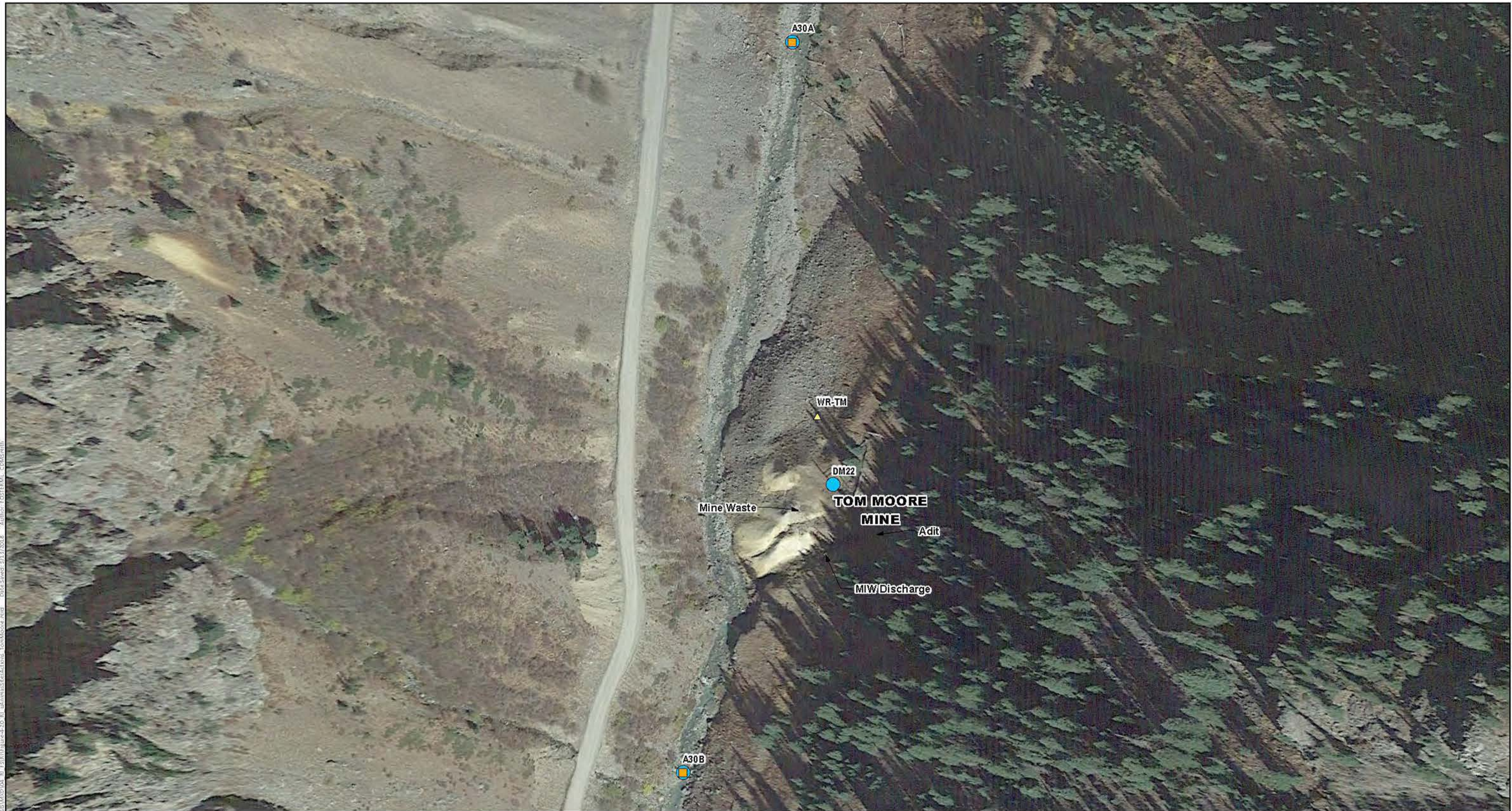
- Surface Water
- Sediment

**Note:**  
MIW = mining-influenced water

**Figure 4-19**  
**Silver Wing Mine**  
Bonita Peak Mining District Superfund Site | San Juan County, CO  
Preliminary Remedial Investigation







Background Terrain: Google Earth Pro  
Imagery: 10/12/2015  
Road and Railroad Source: US Census  
Tiger/Line  
Waterways and Waterbodies Source:  
National Hydrography Dataset - USGS

#### Legend

##### Samples

- Surface Water
- Sediment
- ▲ Waste Rock and Soil

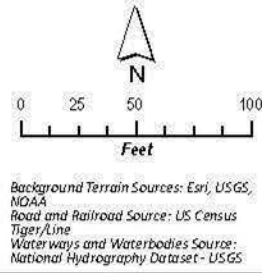
##### Note:

MIW = mining-influenced water

**Figure 4-20**  
**Tom Moore Mine**  
Bonita Peak Mining District Superfund Site | San Juan County, CO  
Preliminary Remedial Investigation







#### Legend

##### Samples

- Surface Water
- Sediment
- ▲ Waste Rock and Soil

##### Note:

MIW = mining-influenced water

**Figure 4-21**  
**Ben Franklin Mine**  
Bonita Peak Mining District Superfund Site | San Juan County, CO  
Preliminary Remedial Investigation





Background Terrain: Google Earth Pro  
Imagery: 10/12/2015  
Road and Railroad Source: US Census  
Tiger/Line  
Waterways and Waterbodies Source:  
National Hydrography Dataset - USGS

#### Legend

##### Samples

- Surface Water
- Sediment
- ▲ Waste Rock and Soil

##### Note:

MIW = mining-influenced water

**Figure 4-22**

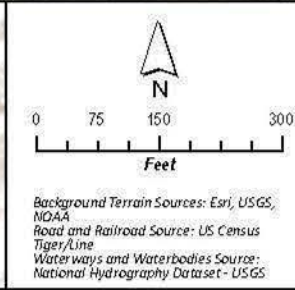
**Terry Tunnel**

Bonita Peak Mining District Superfund Site | San Juan County, CO

Preliminary Remedial Investigation







**Legend**

**Samples**

- Surface Water
- Sediment
- ▲ Waste Rock and Soil

**Note:**

MIW = mining-influenced water

**Figure 4-23**  
**Pride of the West Mine**  
Bonita Peak Mining District Superfund Site | San Juan County, CO  
Preliminary Remedial Investigation







**Legend**  
**Samples**

Background Terrain Sources: Esri, USGS, NOAA  
Source: Esri, DigitalGlobe, GeoEye, Earthstar  
Geographics, CNES/Airbus DS, USDA, USGS,  
AeroGRID, IGN, and the GIS User Community  
Road and Railroad Source: US Census

**Figure 4-24**  
**Campground 4**  
Bonita Peak Mining District Superfund Site | San Juan County, CO  
Preliminary Remedial Investigation



## Attachment A

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Total and Dissolved Metals, Anions, Alkalinity, and  
Hardness Data for 2015 and 2016 EPA/ESAT  
Surface Water Samples

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Attachment A  
Total and Dissolved Metals, Anions, Alkalinity, and Hardness Data for 2015 and 2016 EPA/ESAT Surface Water Samples  
Bonita Peak Mining District, San Juan County, Colorado  
Preliminary Remedial Investigation Report

					Metal Concentrations (µg/L)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
					Aluminum				Antimony				Arsenic				Beryllium				Cadmium				Calcium				Chromium				Copper				Iron				Magnesium																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
					T	Q	D	Result	T	Q	D	Result	T	Q	D	Result	T	Q	D	Result	T	Q	D	Result	T	Q	D	Result	T	Q	D	Result	T	Q	D	Result	T	Q	D	Result	T	Q	D	Result																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
Mine Site	Station Name	Sample Date	pH	Flow (gpm)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										

Attachment A  
Total and Dissolved Metals, Anions, Alkalinity, and Hardness Data for 2015 and 2016 EPA/ESAT Surface Water Samples  
Bonita Peak Mining District, San Juan County, Colorado  
Preliminary Remedial Investigation Report

					Metal Concentrations (µg/L)																																							
					Aluminum				Antimony				Arsenic				Beryllium				Cadmium				Calcium				Chromium				Copper				Iron				Magnesium			
					T	D			T	D			T	D			T	D			T	D			T	D			T	D			T	D			T	D						
Mine Site	Station Name	Sample Date	pH	Flow (gpm)	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q		
Yukon Tunnel	CC41	6/7/2016	5.16	--	2410		07		2.5	U	0.5	U	4.12	J	0.5	U	2	U	2	U	2.98		2.91		33000		33000		5	U	1	U	.4		72.6		8110		2460		2960		2720	
	CC41	/27/2016	3.55	6939	6220		5520		2.5	U	2.5	U	6.49	J	2.5	U	2	U	2	U	6.63		6.36		172000		162000		5	U	5	U	141		6.3		12500		7480		10200		660	
	CC43C	6/7/2016	6.82	--	533		171		2.5	U	2.5	U	2.5	U	2.5	U	2	U	2	U	0.5	U	0.5	U	228000		233000		5	U	5	U	11.6		3.98	J	2460		1190		6810		7120	
	CC43C	/27/2016	6.68	--	486		168		2.5	U	2.5	U	2.5	U	2.5	U	2	U	2	U	0.5	U	0.5	U	223000		215000		5	U	5	U	12.2		2.94	J	2440		1110		6770		6500	
	CC43D	6/7/2016	2.98	--	30900		28200		2.5	U	0.5	U	2.5	U	0.81	J	3.11	J	2.41	J	21.4		18.4		3500		1700		5	U	3.82		3610		2770	J	42900		39300		23400		21900	
	CC43E	6/7/2016	5.37	--	3020		891		2.5	U	0.5	U	5.63	J	0.5	U	2	U	2	U	3		3.19		34900		34700		5	U	1	U	104		82.3		10000		2250		3280		2760	
	CC43E	/27/2016	3.88	7069	5630		5240		2.5	U	2.5	U	3.6	J	2.5	U	2	U	2	U	5.06		5.01		167000		160000		5	U	5	U	84.9		81.9		10100		7080		420		210	
Boston Mine	A07D	6/28/2016	4.23	--	5970		5550		2.5	U	0.5	U	2.5	U	0.5	U	2	U	2	U	7.55		7		7830		7130		5	U	1	U	38.9		34.6		242	J	149	J	1130		1060	
	A07D	10/5/2016	4.11	.0	16000		15100		2.5	U	0.5	U	2.5	U	0.5	U	2	U	2	U	19.1		19.5		15500		14700		5	U	1	U	2.5		2.5		100	U	100	U	2950		2790	
	A07D1	6/28/2016	4.26	55	19300		18000		2.5	U	0.5	U	2.5	U	0.5	U	3.41	J	3.31	J	33.2		32.4		14200		13100		5	U	1	U	55.5		51.3		100	U	100	U	2340		2170	
	A07D2	6/28/2016	4.31	--	2340		2150		2.5	U	0.5	U	2.5	U	0.5	U	2	U	2	U	25.5		23.8		3300		3090		5	U	1	U	6.2		0		100	U	100	U	334		310	
	A07E	6/28/2016	4.18	--	4830		4570		2.5	U	0.5	U	2.5	U	0.5	U	2	U	2	U	5.02		4.93		7080		6700		5	U	1	U	35.4		33		234	J	141	J	1030		86	
	A07E	10/5/2016	3.86	49	13800		13000		2.5	U	0.5	U	2.5	U	0.5	U	2	U	2	U	12.3		13.3		14900		14300		5	U	1	U	64.6		68.8		311		304		2770		2620	
	DM6	6/28/2016	6.13	3.2	121		88.5		2.5	U	1.67		2.5	U	0.5	U	2	U	2	U	8.17		8.7		170		8920		5	U	1	U	30.3		30		443		324		529		527	
London Mine	DM6	/30/2016	3.21	0.7	1220		1100		2.5	U	0.911	J	2.5	U	1.36	J	2	U	2	U	84.4		71.4		26200		24900		5	U	1	U	260		218		6180		4870		1680		1580	
	DM7	6/8/2016	6.69	--	360		23.1	J	3.18	J	1.64		4.25	J	0.595	J	2	U	2	U	13.8		12.8		22400		22800		5	U	1	U	41.3		4.53		2150		100	U	1520		1490	
	DM7	6/28/2016	6.05	1.1	644		41.2	J	4.77	J	2.89		11.9		2.58		2	U	2	U	46.2		43.2		54500		52000		5	U	1	U	107		.9		4700		255		3480		3390	
	DM7	/30/2016	6.41	--	29		37.9	J	4.06	J	2.25		14.8		2.86		2	U	2	U	49.4		42		57800		56800		5	U	1	U	123		6.57		7400		312		3880		3780	
	A07B1	6/28/2016	4.28	1329	7230		6790		2.5	U	0.5	U	2.5	U	0.5	U	2	U	2	U	11.3		10.8		140		8610		5	U	1	U	43.5		39.8		148	J	103	J	1340		1250	
	A07B	/30/2015	4.3	21	14000		13400		2.5	U	0.5	U	2.5	U	0.5	U	5.81		5.98		21.7		23		32600		31400		5	U	1	U	49.8		51.5		166	J	102	J	4760		4530	
	A07B	6/28/2016	4.323	1206	6860		6440		2.5	U	0.5	U	2.5	U	0.5	U	2	U	2	U	10.4		10.7		030		8550		5	U	1	U	42.2		38.9		134	J	108	J	1310		1240	
Ben Butler Mine	A07B	/30/2016	4.08	186	17100		17000		2.5	U	0.5	U	2.5	U	0.5	U	4.92	J	4.86	J	26.4		24.1		25300		24500		5	U	1	U	61.6		56.6		170	J	161	J	3950		3830	
	BB1	6/28/2016	3.97	--	546		502		2.5	U	0.5	U	2.5	U	0.5	U	2	U	2	U	10.7		10.6		5230		5000		5	U	1	U	192		189		373		303		451		428	
Mountain Queen Mine	A18	10/6/2016	7.3	--	520		87.5		2.5	U	2.5	U	2.5	U	2.5	U	2	U	2	U	2.53		2.53		114000		108000		5	U	5	U	46.4		27.9		123	J	100	U	15700		14900	
	A19A	/30/2015	3.7	0.8	3310		3200		2.5	U	0.5	U	2.5	U	1.42	J	2	U	2	U	44.5		45.7		15800		15000		5	U	1	U	1270		1270		5110		5050		2010		2000	
	A19A	/28/2016	--	2.7	3270		3180		2.5	U	0.5	U	2.5	U	1.32	J	2	U	2	U	43		37.9		15200		14100		5	U	1	U	1260		1150		5470		5100		1790		1720	
Vermillion Mine	CG4	/30/2015	5.01	247	16300		15500		2.5	U	0.5	U	2.5	U	0.5	U	21.7		22		18.2		18.7		64700		60200		5	U	1	U	47.2		72.6		140	J	127	J	13900		13600	
	CG4	6/28/2016	6.58	6127	3820		2790		2.5	U	0.5	U	2.5	U	0.5	U	5.41		4.6	J	5.49		5.81		31800		31100		5	U	1	U	18.5		16		108	J	100	U	5610		5470	
	CG4	10/6/2016	5.47	1006	14900		12100		2.5	U	0.5	U	2.5	U	0.5	U	19.5		16.8		13.8		14.2		49800		45900		5	U	1	U	36.6		34.8		495		183	J	11100		10200	
	CG5	6/28/2016	5.48	--	628		602		2.5	U	0.5	U	2.5	U	0.5	U	2	U	2	U	7.84		7.67		3730		3680		5	U	1	U	61.3		60.5		100	U	100	U	446		436	
	CG6	/30/2015	5.17	189	13700		12000		2.5	U	0.5	U	2.5	U	0.5	U	18.3		17		15.9		16.4		67200		63500		5	U	1	U	41.2		35.9		151	J	106	J	12500		12500	
	CG6	6/28/2016	6.46	7803	3620		2540		2.5	U	0.5	U	2.5	U	0.5	U	5.31		4.24	J	5.74		5.65		31600		30600		5	U	1	U	18.3		15.8		111	J	100	U	5400		5210	
	CG6	/30/2016	4.97																																									



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					Metal Concentrations (µg/L)																																							
					Aluminum				Antimony				Arsenic				Beryllium				Cadmium				Calcium				Chromium				Copper				Iron				Magnesium			
					T	D			T	D			T	D			T	D			T	D			T	D			T	D			T	D			T	D						
Mine Site	Station Name	Sample Date	pH	Flow (gpm)	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Columbus Mine	A10	6/9/2015	6.18	--	1		247		2.5	U	0.5	U	2.5	U	0.5	U	2	U	2	U	2.62		3.02		10400		10400		5	U	1	U	23.1		16.2		19	J	100	U	1460		1460	
	A10	/29/2015	5.43	634	6280		3800		2.5	U	0.5	U	2.5	U	0.5	U	8.46		6.56		11.1		11.6		65300		62500		5	U	1	U	41.2		39.4		401		306		8820		8480	
	A10	6/7/2016	--	16137	1480		774		2.5	U	0.5	U	2.5	U	0.5	U	2	U	2	U	2.54		2.72		11800		11900		5	U	1	U	20.5		12.9		195	J	100	U	1810		1830	
	A10	/29/2016	5.13	2387	5480		3790		2.5	U	0.5	U	2.5	U	0.5	U	8.57		7.01		7.69		7.48		43200		41100		5	U	1	U	30.9		25.1		204	J	136	J	6130		5980	
	A11A	6/9/2015	3.05	37	3370		3160		2.5	U	0.5	U	8.65	J	6.38		2	U	2	U	194		193		4340		4830		5	U	1	U	2510		2510		11700		12200		1460		1390	
	A11A	/29/2015	2.89	0.1	31000		29500		2.5	U	0.5	U	12		12		8.11		8.33		1090		896		38200		36400		5	U	3.93		6800		6790		61100		61100		12600		11900	
	A11A	6/7/2016	4.16	27	3360		3450		2.5	U	0.5	U	5.91	J	5.43		2	U	2	U	180		173		4230		4390		5	U	1	U	2350		2310		11300		11600		1460		1510	
	A11A	/30/2016	2.85	0.3	25600		24900		2.5	U	2.5	U	14		11		6.22		6.13		1030		38		30100		28400		6.12	J	5	U	6960		6300		54700		51600		650		400	
	CG11	6/9/2015	6.26	2179	1000		222		2.5	U	0.5	U	2.5	U	0.5	U	2	U	2	U	2.11		2.28		10100		80		5	U	1	U	15.8		.39		179	J	100	U	1450		1410	
	CG11	/29/2015	5.34	572	6610		3830		2.5	U	0.5	U	2.5	U	0.5	U	8.81		6.5		.54		10.2		66600		62200		5	U	1	U	31.5		27.9		440		324		8780		8550	
CG11	6/7/2016	6.46	--	1480		587		2.5	U	0.5	U	2.5	U	0.5	U	2	U	2	U	2.29		2.17		10300		10500		5	U	1	U	24.9		8.96		306		100	U	1560		1570		
CG11	/30/2016	5.34	3305	5390		3510		2.5	U	0.5	U	2.5	U	0.5	U	7.68		6.25		6.89		6.28		40800		40300		5	U	1	U	22.4		17.1		173	J	163	J	5970		5790		
Silver Wing Mine	A28	6/9/2015	7.57	--	137		43.5	J	2.5	U	0.5	U	2.5	U	0.5	U	2	U	2	U	2.04		1.78		12100		12900		5	U	1	U	7.23		6.88		100	U	100	U	1290		1220	
	A28	/30/2015	7.03	1754	1400		39.5	J	2.5	U	0.5	U	2.5	U	0.5	U	2	U	2	U	4.69		4.43		56000		51600		5	U	1	U	12.2		3.56		100	U	100	U	5470		5180	
	A28	6/28/2016	7.62	--	848		52		2.5	U	0.5	U	2.5	U	0.5	U	2	U	2	U	2.25		2.46		18500		18000		5	U	1	U	11.3		4.73		100	U	100	U	2140		2060	
	A30	6/9/2015	7.52	--	454		44.7	J	2.5	U	0.5	U	2.5	U	0.5	U	2	U	2	U	2.07		1.85		11800		13100		5	U	1	U	23.5		13.4		115	J	100	U	1250		1210	
	A30	/30/2015	5.82	2503	1390		42.9	J	2.5	U	0.5	U	2.5	U	0.5	U	2	U	2	U	4.79		4.44		57000		52900		5	U	1	U	83.2		19.3		180	J	100	U	5550		5200	
	A30	6/7/2016	7.54	--	747		54.6		2.5	U	0.5	U	2.5	U	0.5	U	2	U	2	U	1.9		1.92		12800		13400		5	U	1	U	18.6		7.9		204	J	100	U	1410		1460	
	A29	6/9/2015	6.42	--	1380		428		2.5	U	2.5	U	.7		2.5	U	2	U	2	U	14		14.1		117000		129000		5	U	5	U	6190		2320		10900		2470		4890		4800	
	A29	/30/2015	5.74	--	1860		58		3.43	J	1.16		132		4.4		2	U	2	U	16.6		15.1		134000		123000		5	U	1	U	10200		4200		16000		6130		5440		5130	
	A29	6/7/2016	6.49	7.3	1590		762		4.15	J	1.16		161		2.87		2	U	2	U	16.1		16.4		131000		141000		5	U	1.32	J	6280		2730		13700		3870		5390		5580	
	A29	/28/2016	--	--	1590		603		2.5	U	0.748	J	110		3.1		2	U	2	U	14.8		14.6		138000		131000		5	U	1	U	6970		2770		11700		2790		5360		5240	
A29A	6/9/2015	6.96	--	825		31.5	J	2.5	U	2.5	U	39.7		2.5	U	2	U	2	U	13.4		13.5		117000		126000		5	U	5	U	3820		712		5570		100	U	4940		4870		
A29A	6/7/2016	7.08	--	1800		8.5		5.38		0.944	J	143		1.17	J	2	U	2	U	14.7		15.3		127000		132000		5	U	1	U	6660		509		15600		137	J	5150		5400		
Tom Moore Mine	A30A	6/8/2016	7.29	--	659		45.8	J	2.5	U	0.5	U	2.5	U	0.5	U	2	U	2	U	1.86		1.82		12500		12800		5	U	1	U	15.6		6.44		201	J	100	U	1410		1360	
	A30A	/29/2016	6.94	--	1740		74.2		2.5	U	0.5	U	2.5	U	0.5	U	2.27	J	2	U	4.25		3.98		44900		42500		5	U	1	U	35.2		7.45		102	J	100	U	4430		4330	
	A30B	6/8/2016	7.45	--	602		47.3	J	2.5	U	0.5	U	2.5	U	0.5	U	2	U	2	U	1.68		1.71		13900		14100		5	U	1	U	14.5		5.98		204	J	100	U	1530		1530	
	A30B	/29/2016	6.97	7096	1810		67.5		2.5	U	0.5	U	2.5	U	0.5	U	2.37	J	2	U	4.09		3.98		45600		42700		5	U	1	U	53.4		7.79		128	J	100	U	4410		4290	
Ben Franklin Mine	DM22	6/28/2016	7.31	--	29.6	J	23.3	J	2.5	U	0.5	U	2.5	U	0.5	U	2	U	2	U	1.14		1.18		71200		68800		5	U	2.92		2.5	U	0.515	J	100	U	100	U	1970		1910	
	DM22	/28/2016	--	21	27.1	J	23.9	J	2.5	U	0.5	U	2.5	U	0.5	U	2	U	2	U	0.77	J	0.811		78400		75900		5	U	1.53	J	2.5	U	0.598	J	100	U	100	U	2250		2150	
	ARD1	/29/2015	3.1	--	7180		6370		2.5	U	0.5	U	2.5	U	0.558	J	2	U	2	U	57.5		55.6		37900		33700		5	U	1	U	1940		1970		3560		2390		10300		470	
	ARD1	6/28/2016	2.76	--	3860		3630		2.5	U	0.5	U	2.5	U	0.5	U	2	U	2	U	43.8		41		25800		24200		5	U	1	U	19 0		1880		5520		5190		5080		4820	
	ARD1	/28/2016	3.12	--	80		650		2.5	U	2.5	U	2.5	U	2.5	U	2	U	2	U	79.7		72.9		38300		37300		5	U	5	U	2690		2420		4080		3940		11300		11000	
	EG3A	/29/2015	7.25	35	63	</																																						

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			Metal Concentrations (µg/L)																								Chloride (mg/L)		Fluoride (mg/L)		Sulfate as SO4 (mg/L)		Total Alkalinity (mg CaCO3 /L)		Nitrate/Nitrite as N (mg/L)		Hardness (mg/L)									
			Manganese				Lead				Nickel				Selenium				Silver				Strontium				Thallium				Zinc															
Mine Site	Station Name	Sample Date	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q								
Longfellow Mine	M02D	6/29/2016	80		51.9		1.45		0.213		2.5	U	0.5	U	5	U	1	U	2.5	U	0.5	U	273		259		5	U	1	U	10	U	10	U	0.7	J	0.1	U	16.6		20.2		0.1	U	35	
	M02D	10/7/2016	88.1		64.7		0.931	J	0.185	J	2.5	U	0.5	U	5	U	1	U	2.5	U	0.5	U	361		344	J	5	U	1	U	10	U	10	U	0.4	J	0.1	U	19.9		23.3		0.1	U	41	
Junction Mine	M02B	6/29/2016	348		365		131		5.26		3.75	J	4.03		5	U	1	U	2.5	U	0.5	U	1240		1180		5	U	1	U	1640		1770		0.8		0.4		120		5	U	0.1	U	103	
	M02B	10/7/2016	1780		1740		304		300		16.6		17		5	U	1	U	2.5	U	0.5	U	3180		3000	J	5	U	1	U	6590		6510		4	U	1.7	J	336		5	U	1	U	179	
Koehler Tunnel	M02K1	6/29/2016	16600		16400		3.19		3.29		71.9		77.8		5	U	5	U	2.5	U	2.5	U	6330		5980		5	U	5	U	17700		18100		2.8	J	2		642		5	U	0.4	U	513	
	M02C	10/7/2016	37600		37300		152		1.51		182		185		5	U	5	U	2.5	U	2.5	U	13100		12400	J	5.79	J	6.27	J	41500		41400		4	U	3.6		1630		5	U	1	U	1140	
	M02E	6/29/2016	7220		7020		100		36.6		32.3		32.4		5	U	1	U	2.5	U	0.5	U	3160		2950		5	U	1	U	7870		7930		3.1	J	0.8		385		5	U	0.4	U	309	
	M02E	10/7/2016	20800		17200		59.8		73.4		2.5		80.5		5	U	5	U	2.5	U	2.5	U	7320		6360	J	5	U	5	U	22400		18700		4	U	2.3		45		5	U	1	U	617	
	M02	6/29/2016	4120		4050		75.3		8.87		17.6		18.8		5	U	1	U	2.5	U	0.5	U	2430		2340		5	U	1	U	4590		4690		1.6		0.4		272		5	U	0.2	U	229	
	M02	10/7/2016	16200		15600		35.5		35.1		70.5		72.5		5	U	5	U	2.5	U	2.5	U	5910		5600	J	5	U	5	U	16800		16400		4	U	1.4	J	735		5	U	1	U	555	
Brooklyn Mine	M12	6/7/2016	488		301		14.6		0.198	J	2.5	U	1.44		5	U	1	U	2.5	U	0.5	U	154		139		5	U	1	U	174		156		0.7	J	0.1	J	34.7		5	U	0.1	U	36	
	M12	6/29/2016	1320		1300		3.3		2.52		6.04		6.55		5	U	1	U	2.5	U	0.5	U	384		366		5	U	1	U	861		887		0.8		0.3		118		5	U	0.1	U	4	
	M12	/29/2016	2280		2280		3.88		4.02		12.1		11.4		5	U	1	U	2.5	U	0.5	U	59		579		5	U	1	U	1300		1370		0.8	U	0.6		231		5	U	0.2	U	158	
	M12A	6/29/2016	79		763		7.04		1.44		4.17	J	4.28		5	U	1	U	2.5	U	0.5	U	397		368		5	U	1	U	282		276		0.8		0.3		6.3		5	U	0.1	U	76	
	M12A	/30/2016	1440		1440		1.66		1.55		8.86		8.4		5	U	1	U	2.5	U	0.5	U	612		598		5	U	1	U	347		363		0.8	J	0.6		205		5	U	0.2	U	134	
	M12B	6/29/2016	545		535		1.11		0.65		2.97	J	3.37		5	U	1	U	2.5	U	0.5	U	334		315		5	U	1	U	61		54.6		0.8		0.3		84.7		5	U	0.1	U	64	
	M12B	/30/2016	1190		1190		0.81	J	0.631		7.84		7.48		5	U	1	U	2.5	U	0.5	U	570		546		5	U	1	U	81		81.5		0.9	J	0.6		197		5	U	0.2	U	119	
	M12C	6/29/2016	5240		5100		25.1		1.69		7.88		.21		5	U	1	U	2.5	U	0.5	U	2570		2420		5	U	1	U	4670		4600		3.9		1.4		591		5	U	0.4	U	286	
	M12C	/29/2016	6440		6430		116		20.7		12.9		11.8		5	U	1	U	2.5	U	0.5	U	2440		2410		5	U	1	U	5780		6060		0.8	U	1		392		--		--		306	
	M12C	/30/2016	6380		6390		25		18.2		12.9		12.1		5	U	1	U	2.5	U	0.5	U	2340		2270		5	U	1	U	5690		5950		1.6	U	0.9		402		5	U	0.4	U	293	
	M12D	/30/2016	6300		6300		24.7		19.5		11.7		11.2		5	U	1	U	2.5	U	0.5	U	2410		2320		5	U	1	U	5810		6100		1.6	U	0.9		380		5	U	0.4	U	297	
	M12F	10/7/2016	193		4.09	J	0.5	U	0.1	U	2.5	U	0.5	U	5	U	1	U	2.5	U	0.5	U	2630		2470	J	5	U	1	U	10	U	10	U	0.8	U	0.4		229		58.9		0.2	U	262	
	M12G	10/7/2016	38		15		126		125		2.71	J	3.79		5	U	1	U	2.5	U	0.5	U	188		176	J	5	U	1	U	117		121		0.4	U	0.2		51.7		5	U	0.1	U	39	
Bandora Mine	M23	/27/2016	200		200		0.5	U	0.246		4.96	J	4.97		5	U	1	U	2.5	U	0.5	U	149		138		5	U	1	U	32.5		40		0.4	J	0.2		79.9		5	U	0.1	J	73	
	M24A	/28/2016	6770		4870		77		0.147	J	10.5		7.7		5	U	1	U	2.5	U	0.5	U	603		549		5	U	1	U	13500		8750		0.8	U	0.9		259		32.6		0.2	U	238	
	M24B	/28/2016	5290		4940		201		3.69		8.79		8.14		5	U	1	U	2.5	U	0.5	U	588		543		5	U	1	U	11200		11200		--		--		--		--		--	236		
	M24C	/28/2016	2100		2030		0.663	J	0.581	J	2.5	U	2.5	U	5	U	5	U	2.5	U	2.5	U	816		750		5	U	5	U	540		541		1.6	U	0.7	J	275		104		0.4	U	346	
	M24D	/27/2016	4780		4630		177		0.1	U	8.83		8.14		5	U	1	U	2.5	U	0.5	U	588		542		5	U	1	U	10700		250		0.8	U	0.8		257		29.3		0.2	U	236	
	M25	6/29/2016	0.7		89.8																																									

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			Metal Concentrations (µg/L)																												Chloride (mg/L)		Fluoride (mg/L)		Sulfate as SO4 (mg/L)		Total Alkalinity (mg CaCO3 /L)		Nitrate/Nitrite as N (mg/L)		Hardness (mg/L)					
			Manganese				Lead				Nickel				Selenium				Silver				Strontium				Thallium				Zinc															
T	Q	D	T	Q	D	T	Q	D	T	Q	D	T	Q	D	T	Q	D	T	Q	D	T	Q	D	T	Q	D	T	Q	D	T	Q	D	T	Q	D	T	Q	D								
Mine Site	Station Name	Sample Date	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q						
Yukon Tunnel	CC41	6/7/2016	1060		78		43.1		5.73		2.85	J	2.12		5	U	1	U	2.5	U	0.5	U	332		323		5	U	1	U	858		854		0.8		0.4		105		5	U	0.1	J	3	
	CC41	/27/2016	5110		4920		27.2		17.1		10.6		.09		5	U	5	U	2.5	U	2.5	U	1970		1860		5	U	5	U	2610		2420		1.6	U	1.8		554		5	U	0.4	U	444	
	CC43C	6/7/2016	793		768		2.76		0.5	U	2.5	U	2.5	U	5	U	5	U	2.5	U	2.5	U	4910		4780		5	U	5	U	109		100		--		--		--		--		611			
	CC43C	/27/2016	1130		1090		2.65		0.5	U	2.5	U	2.5	U	5	U	5	U	2.5	U	2.5	U	4710		4610		5	U	5	U	121		108		--		--		--		--		564			
	CC43D	6/7/2016	6530		6170		3.89		4.11		.39		30.7		5	U	1.43	J	2.5	U	0.5	U	1300		1240		5	U	1	U	5810		5720		6.4	J	4.4		563		5	U	1	U	319	
	CC43E	6/7/2016	1100		77		59.4		4.52		2.89	J	2.17		5	U	1	U	2.5	U	0.5	U	387		362		5	U	1	U	12		19		0.8		0.4		106		5	U	0.1	J	8	
	CC43E	/27/2016	4170		4150		15.2		13.9		.19		7.68		5	U	5	U	2.5	U	2.5	U	2080		2050		5	U	5	U	2070		2050		1.6	U	1.7		535		5	U	0.4	U	437	
Boston Mine	A07D	6/28/2016	2160		2100		11.6		.47		4.73	J	4.45		5	U	1	U	2.5	U	0.5	U	13.5		12.3		5	U	1	U	1130		1140		0.7	J	0.2		58.8		5	U	0.1	U	22	
	A07D	10/5/2016	4860		4810		7.22		7.47		10.7		10.6		5	U	1	U	2.5	U	0.5	U	21		19.9		7.76	J	1	U	2840		2830		0.4	U	0.6		155		5	U	0.1	J	48	
	A07D1	6/28/2016	6080		5890		1.52		1.26		15.6		14.4		5	U	1	U	2.5	U	0.5	U	19.1		17.5		5	U	1	U	6020		5870		0.9		0.7		168		5	U	0.1	U	42	
	A07D2	6/28/2016	824		793		22.5		18.7		2.5	U	1.95		5	U	1	U	2.5	U	0.5	U	13.6		12.5		5	U	1	U	3740		3680		0.8		0.1	J	28		5	U	0.2			
	A07E	6/28/2016	1820		1780		11.6		.77		3.9	J	3.5		5	U	1	U	2.5	U	0.5	U	12.9		12		5	U	1	U	715		718		0.7	J	0.2		51.2		5	U	0.1	U	21	
	A07E	10/5/2016	5090		4950		14		15.4		8.9		.06		5	U	1	U	2.5	U	0.5	U	19.2		18.2		8.15	J	1	U	2150		2120		0.4	U	0.6		143		5	U	0.2		46	
	DM6	6/28/2016	189		197		61.7		48.3		2.5	U	0.5	U	5	U	1	U	2.5	U	0.5	U	50.6		48.4	J	5	U	1	U	1540		1680		1		0.1	U	25.1		5	U	0.1	U	24	
London Mine	DM6	/30/2016	1640		1550		226		202		5.27		3.9		5	U	1	U	2.5	U	0.5	U	257		225		5	U	1	U	17200		17200		0.8	U	0.4		135		5	U	0.2	U	69	
	DM7	6/8/2016	277		234		13.3		0.1	J	2.5	U	0.5	U	5	U	1	U	2.5	U	0.5	U	290		292		5	U	1	U	2930		2870		1		0.4		51		16		0.1	U	63	
	DM7	6/28/2016	1030		84		22.1		0.23		2.5	U	0.57	J	5	U	1	U	2.5	U	0.5	U	765		730	J	5	U	1	U	8130		8120		1.7		0.8		137		33.7		0.1	U	144	
	DM7	/30/2016	1230		1230		27.9		0.1	U	2.5	U	0.739	J	5	U	1	U	2.5	U	0.5	U	845		784		5	U	1	U	8170		8280		1.4	J	1.1		153		34.9		0.2	U	157	
	A07B1	6/28/2016	2540		2480		11.2		.57		5.82		5.51		5	U	1	U	2.5	U	0.5	U	19.6		18.1		13.5		1	U	1810		1790		0.7	J	0.4		72		5	U	0.1	U	27	
	A07B	/30/2015	5890		6110		8.87		.44		13.5		13.9		5	U	1	U	2.5	U	0.5	U	--		--		2.5	U	0.5	U	39 0		4340		1.6	U	1.9		217	J	5	U	0.4	U	7	
	A07B	6/28/2016	2380		2340		10.8		.34		6.65		5.23		5	U	1	U	2.5	U	0.5	U	22.7		20.9		12.3		1	U	1690		1720		0.8		0.4		68.2		5	U	0.1	U	26	
	A07B	/30/2016	5980		5920		10.5		.35		14.4		13.7		5	U	1	U	2.5	U	0.5	U	66		64.8		5	U	1	U	4260		4280		0.4	U	1.8		191		5	U	0.1	J	77	
Ben Butler Mine	BB1	6/28/2016	2.8		89.6		830		819		2.5	U	0.627	J	5	U	1	U	6.01		6.2		25.5		24		5	U	1	U	2080		2050		1.2		0.1	U	30.3		5	U	0.5		14	
Mountain Queen Mine	A18	10/6/2016	498		476		0.9 6	J	0.5	U	2.5	U	2.5	U	5	U	5	U	2.5	U	2.5	U	1020		70		5	U	5	U	374		360		0.8	U	0.8		328		27.4		0.2	J	332	
	A19A	/30/2015	5750		5700		192		208		4.91	J	4.74		5	U	1	U	2.5	U	0.889	J	--		--		2.5	U	0.5	U	5630		6230		0.8	U	1.4		128	J	5	U	0.2	U	46	
	A19A	/28/2016	4190		4030		139		137		4.69	J	4.29		5	U	1	U	2.5	U	0.679	J	55.4		53.5		10		1	U	5060		4920		--		--		--		--		--	42		
Vermillion Mine	CG4	/30/2015	36400		36600		0.567	J	0.552		19.2		19.9		5	U	1	U	2.5	U	0.5	U	--		--		2.5	U	0.5	U	6030		6270		4	U	12.3		487	J	5	U	1	U	207	
	CG4	6/28/2016	020		210		1.16		0.452		4.32	J	4.39		5	U	1	U	2.5	U	0.5	U	198		190		5	U	1	U	1550		1660		0.7	J	2.2		128		5	U	0.1	J	100	
	CG4	10/6/2016	27300		26600		1.36		0.644		14.7		14.5		5	U	1	U	2.5	U	0.5	U	209		197		5	U	1	U	4380		4240		0.8	U	.2		277		5	U	0.2	U	157	
	CG5	6/28/2016	472		479		47.7		44.8		2.5	U	1.16		5	U	1	U	2.5	U	0.5	U	11.1		10.7		5	U	1	U	1730		1900		0.7	J	0.1	U	19.3		5	U	0.1	U	11	
	CG6	/30/2015	31600		31500		1.41		0.597		17.4		16.4		5	U	1	U	2.5																											

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			Metal Concentrations (µg/L)																								Chloride (mg/L)		Fluoride (mg/L)		Sulfate as SO4 (mg/L)		Total Alkalinity (mg CaCO3 /L)		Nitrate/Nitrite as N (mg/L)		Hardness (mg/L)									
			Manganese				Lead				Nickel				Selenium				Silver				Strontium																Thallium				Zinc			
			T		D		T		D		T		D		T		D		T		D		T		D		T		D		T		D		T		D		T		D					
Mine Site	Station Name	Sample Date	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q				
Columbus Mine	A10	6/9/2015	2100		2080		14.4		2.81		2.5	U	1.83		5	U	1	U	2.5	U	0.5	U	--		--		2.5	U	0.5	U	67		69		--		--		--		--		32			
	A10	/29/2015	17500		18000		8.13		7.22		7.9		8.38		5	U	1	U	2.5	U	0.5	U	--		--		2.5	U	0.5	U	4130		4560		1.6	U	5.4		279	J	5	U	0.4	U	191	
	A10	6/7/2016	3160		3100		37.3		3.67		2.5	U	1.87		5	U	1	U	2.5	U	0.5	U	52.7		52.6		5	U	1	U	34		32		0.7	J	0.8		41.8		5	U	0.1	U	37	
	A10	/29/2016	13000		12700		5.66		4.31		7.42		6.68		5	U	1	U	2.5	U	0.5	U	237		232		5	U	1	U	2670		2630		0.4	U	4.2		170		5	U	0.1	U	127	
	A11A	6/9/2015	1840		1900		1010		47		7.64		8.34		5	U	3.71		2.5	U	0.5	U	--		--		2.5	U	0.5	U	47000		51200		--		--		--		--		18			
	A11A	/29/2015	17600		17900		254		289		66.5		65.8		17.4		15.8		2.5	U	0.5	U	--		--		2.5	U	0.676	J	278000		302000		8	U	2	U	1440	J	5	U	2	U	140	
	A11A	6/7/2016	1710		1720		11		13		7.65		7.7		5	U	1.17	J	2.5	U	0.5	U	15.9		16.2		5	U	1	U	40300		43100		1.3	J	0.2	J	178		5	U	0.3	J	17	
	A11A	/30/2016	12400		12100		302		254		58.5		52.6		19.1		12.5		2.5	U	2.5	U	5		0.4		5	U	5	U	229000		223000		4	U	1.1	J	50		5	U	1	U	110	
	CG11	6/9/2015	1910		1970		10.8		1.87		2.5	U	1.72		5	U	1	U	2.5	U	0.5	U	--		--		2.5	U	0.5	U	696		762		--		--		--		--		31			
	CG11	/29/2015	17700		17600		7.29		5.96		8.98		8.94		5	U	1	U	2.5	U	0.5	U	--		--		2.5	U	0.5	U	3930		3930		1.6	U	6		303	J	5	U	0.4	U	191	
CG11	6/7/2016	2690		2550		89.9		2.74		2.5	U	1.68		5	U	1	U	2.5	U	0.5	U	45.7		45.8		5	U	1	U	765		759	J	0.7	J	0.7		35.9		5	U	0.1	U	33		
CG11	/30/2016	12200		12100		4.15		3.23		6.68		5.52		5	U	1	U	2.5	U	0.5	U	239		226		5	U	1	U	2280		2380		0.4	J	4		165		5	U	0.1	U	124		
Silver Wing Mine	A28	6/9/2015	736		721		1.81		0.763		2.5	U	0.826	J	5	U	1	U	2.5	U	0.5	U	--		--		2.5	U	0.5	U	452		480		--		--		--		--		--		37	
	A28	/30/2015	3870		3800		3.85		0.442		2.5	U	0.525	J	5	U	1	U	2.5	U	0.5	U	--		--		2.5	U	0.5	U	1360		1330		0.8	U	1.2		160	J	23.5		0.2	U	150	
	A28	6/28/2016	1850		1780		3.48		0.613		2.5	U	0.921	J	5	U	1	U	2.5	U	0.5	U	116		112		11		1	U	587		569		0.7	J	0.4		48.1		11.1		0.1	J	53	
	A30	6/9/2015	745		715		7.76		0.918		2.5	U	0.778	J	5	U	1	U	2.5	U	0.5	U	--		--		12		0.5	U	507		496		--		--		--		--		38			
	A30	/30/2015	3810		3750		4.82		0.313		2.73	J	0.5	U	5	U	1	U	2.5	U	0.5	U	--		--		15.5	J+	0.5	U	1440		1410		0.8	U	1.2		163	J	23.2		0.2	U	154	
	A30	6/7/2016	1250		1190		14.6		0.672		2.5	U	0.595	J	5	U	1	U	2.5	U	0.5	U	65.8		64.5		5	U	1	U	505		504		0.7	J	0.4		29.8		.78	J	0.1	J	39	
	A29	6/9/2015	3100		3120		25.8		0.5	U	2.5	U	2.5	U	5	U	5	U	2.5	U	2.5	U	--		--		2.5	U	2.5	U	3950		4010		--		--		--		--		341			
	A29	/30/2015	3520		3480		25.5		0.1	U	2.5	U	0.5	U	5	U	1	U	2.5	U	0.5	U	--		--		15	J+	0.5	U	4320		4500		4	U	3.6		407	J	25.1		1	U	329	
	A29	6/7/2016	3300		3170		22.7		0.1	U	2.5	U	0.5	U	5	U	1	U	2.5	U	0.5	U	1620		1710		5	U	1	U	4220		4260		1.4	J	3.4		350		31.2		0.2	U	375	
	A29	/28/2016	3290		3250		19.1		0.159	J	2.5	U	0.5	U	5	U	1	U	2.5	U	0.5	U	1730		1670		5	U	1	U	4020		3870		--		--		--		--		--		349	
A29A	6/9/2015	3030		3040		12.8		0.5	U	2.5	U	2.5	U	5	U	5	U	2.5	U	2.5	U	--		--		12		2.5	U	3790		3830		--		--		--		--		--		335		
A29A	6/7/2016	3070		3130		61.8		0.1	U	2.5	U	0.5	U	5	U	1	U	2.5	U	0.5	U	1580		1610		5	U	1	U	3900		3960		0.7	J	1.7		171		27.6		0.1	U	352		
Tom Moore Mine	A30A	6/8/2016	1200		1120		11.5		0.582		2.5	U	0.557	J	5	U	1	U	2.5	U	0.5	U	64.9		65.9		5	U	1	U	469		474		0.7	J	0.4		29.3		10		0.1	J	38	
	A30A	/29/2016	3760		3670		3.22		0.321		2.5	U	1.43		5	U	1	U	2.5	U	0.5	U	264		257		5	U	1	U	1130		1030		0.4	U	1.3		120		16.8		0.2		124	
	A30B	6/8/2016	1100		1010		12.1		0.532		2.5	U	0.5	U	5	U	1	U	2.5	U	0.5	U	75.1		74.3		5	U	1	U	433		433		0.7	J	0.3		31.3		11.4		0.1	J	42	
	A30B	/29/2016	3670		3580		3.48		0.339		2.5	U	1.25		5	U	1	U	2.5	U	0.5	U	267		259		5	U	1	U	1120		1020		0.4	U	1.3		120		16.7		0.2		124	
	DM22	6/28/2016	409		411		0.826	J	0.284		2.5	U	0.5	U	5	U	1	U	2.5	U	0.5	U	694		662	J	5	U	1	U	627		673		0.8		1		85.3		100		0.1	U	180	
	DM22	/28/2016	165		156		0.5	U	0.1	U	2.5	U	0.5	U	5	U	1	U	2.5	U	0.5	U	774		719		5	U	1	U	572		619		--		--		--		--		--		198	
Ben Franklin Mine	ARD1	/29/2015	22300		22300		840		861		12.8		11.8		5	U	1.12	J	2.5	U	1.71		--		--		2.5	U	0.5	U	19 00		19500		4	U	1.1	J	351	J	5	U	1	U	123	
	ARD1	6/28/2016	12700		12300		74																																							

## Attachment B

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### Total Recoverable Metals Concentrations for 2015 and 2016 EPA/ESAT Waste Rock and Soil Samples



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Attachment B

Total Recoverable Metals Concentrations for 2015 and 2016 EPA/ESAT Waste Rock and Soil Samples

Bonita Peak Mining District, San Juan County, Colorado

Preliminary Remedial Investigation Report

Sample Location	Waste Rock/Soil Sample Location	Sample Date	Aluminum		Antimony		Arsenic		Barium		Beryllium		Cadmium		Calcium		Chromium		Cobalt		Copper	
Mineral Creek																						
WR-M02B	Longfellow Mine Waste Rock	7/28/2016	5920	J	49.2	J-	3160		133		0.3	U	4.8	J-	10500	J	3.8		4.9		669	
WR-M02D	Junction Mine Waste Rock	7/28/2016	8630	J	30.1	J-	1720		145		0.55	J	5.4	J-	1410	J	16.5		5		487	
WR-M02C	Koehler Tunnel Waste Rock (10 sieve)	7/28/2016	6300	J	18.5	J-	13700		101		1.8	U	3.3	J-	28500	J	6.2		8.9		539	
WR-M02C	Koehler Tunnel Waste Rock (60 sieve)	7/28/2016	7250	J	21.3	J-	22200		135		0.29		5	UJ	65300	J	10.9		9	J	470	
M02E	Junction Mine / Koehler Tunnel Pond	10/7/2016	11700		2.5	J	125		100		0.044	U	2.5		20800		3.4		7.1		175	
M02	Junction Mine / Koehler Tunnel Downstream	10/7/2016	20400		0.04	UJ	14.6		166		0.053	U	0.056	U	4250		6.5		10.5		30.2	
WR-M12	rooklvn Mine Adit Waste Rock	7/28/2016	7610	J	2.7	J-	86.4		92.4		0.12	J	0.18	J-	3	UJ	9.9		2.2		47.4	
WR1-M12	rooklvn Mine Waste Rock #1	7/28/2016	6060		12.7		72.5		91.5		0.14		1.8	J	1440		3.1		4.4		123	
WR2-M12	rooklvn Mine Waste Rock #2	7/28/2016	11600		5.5		137		103		0.22		0.51	J	1930		5.3		4.8		117	
M12C	rooklvn Adit	9/30/2016	10400		3.5	J	103	J	64.8	J	0.05	U	0.052	U	1280	J	2.9		3.3		99.2	J
M12D	rooklvn Drainage Channel	9/30/2016	6960		1.6	J	39.6	J	127	J	0.047	U	1.1		679	J	10.5		15.6		28.8	J
M12E	rooklvn Drainage Channel	10/7/2016	22600		0.034	UJ	7.2		106		0.046	U	0.048	U	2700		4.6		9.3		23	
M12A	rooklvn Drainage Channel Downstream	9/30/2016	9880	J	0.041	UJ	36.8	J	161	J-	0.054	U	0.057	U	3360	J	3.4		14.3	J	24.5	
M12B	rooklvn Mine Upstream in Irons Gulch	9/30/2016	8260	J	0.035	UJ	34.5	J	103	J-	0.047	U	0.049	UJ	3.3	UJ	1.1	J	4.8	J	15.9	
M12	rooklvn Mine Downstream in Irons Gulch	9/29/2016	15700	J	0.037	UJ	16.4	J	170	J-	0.049	U	1.9	J-	3240	J	10.5		19.1	J	56.3	
WR1-M24	andora Mine Waste Rock #1	7/28/2016	6580		59.3		85		149		1.6		86.3	J	2970		3.9		20.4		1410	
WR2-M24	andora Mine Waste Rock #2	7/28/2016	8160		176		108		1110		0.47		10.7	J	18700		5.1		3.7		1710	
WR3-M24	andora Mine Waste Rock #3	7/28/2016	4640		118	J	150		58.1	J	0.58		147	J	9250		2.1		4.2	J	1610	
WR4-M24	andora Mine Waste Rock #4	7/28/2016	12700		4.5		33.9		184		4		160	J	1400		7.1		117		2790	
M24D	andora Mine Drainage into South Fork	9/27/2016	21300		0.85	J	8.9		93.8	J	0.79		21.1		5220	J	5.4		11.1	J	197	
M23	andora Mine Upstream	9/27/2016	14600		0.13	J	4		76.7	J	0.3	J	0.21	J	4920	J	5.9		5.8	J	13.9	
M25	andora Mine Downstream	9/27/2016	18200		0.31	J	27.9		141	J	0.47	J	1.1		12800	J	6.7		5.8	J	12	
Cement Creek																						
WR-CC01C	Grand Mogul Mine Waste Rock 1	7/27/2016	4970		65.8	J	106		64.9	J	0.17	J	15.2	J	596		3.8		1	J	2050	
WR-CC01C2	Grand Mogul Mine Waste Rock 2	7/27/2016	3550		64.6	J	81		66.1	J	0.27		20.1	J	2.9	U	2.2		0.59	J	758	
WR-CC02A	Grand Mogul Mine Western Waste Rock	7/27/2016	4390	J	28.4	J-	72.9		132		0.21		4.7	J-	3	UJ	1.6		0.47		225	
CC01F	Grand Mogul Mine Upstream	9/28/2016	12300		0.039	UJ	23	J	57.7		0.052	U	0.054	U	1260		5.8		10.2		59.5	J
CC01C	Grand Mogul Mine below Waste Rock 1	9/28/2016	10400		3.3	J	41.4	J	30.7		0.052	U	0.91		1010		4		4.9		191	J
CC01C1	Grand Mogul Mine below Waste Rock 2	9/28/2016	11400		0.048	UJ	36.6	J	99.5		0.064	U	3.9		1720		4.1		5.3		192	J
CC01C2	Grand Mogul Mine before Confluence with CC	9/28/2016	25300		0.046	UJ	36.3	J	136		1.7		54.5		996		6.6		39.5		995	J
CC01H	Grand Mogul Mine after Confluence with CC	9/27/2016	16800		0.044	UJ	41.3	J	62.8		0.83		6.5		615	J	5.5		19.5		549	J
CC02I	Grand Mogul Western Waste Rock Channel	9/27/2016	15000	J	2.5	J	28.4		129		0.056	U	3.2	J	2060	J	8.2	J	17.5		131	
CC01U	Grand Mogul Mine Downstream in CC	9/27/2016	13000	J	7.2	J	50.5		126		0.9		2.5	J	1660	J	5.6	J	10.8		241	
WR-CC14A	Natalie/Occidental Mine Waste Rock 1	7/27/2016	11200	J	0.81	J-	28.9		21.9		0.27		0.15	J-	1150	J	6.2		4.4		48.3	
WR-CC14B	Natalie/Occidental Mine Waste Rock 2	7/27/2016	7390	J	2.5	J-	35.9		67.5		0.28		0.29	J-	656	J	3.7		6.7		71.4	
CC15	Natalie/Occidental Mine Upstream	9/29/2016	9570	J	0.035	UJ	14.8	J-	68		0.047	U	0.049	U	833	J	2.6		4.1		25.2	J
CC15A	Natalie/Occidental Mine Downstream	9/29/2016	8220	J	0.035	UJ	20.5	J-	51.2		0.046	U	0.049	U	1040	J	2.6		3.9		29.9	J
WR-CC22	Henrietta Mine Waste Rock	7/27/2016	7330	J	12.9	J-	109		177		0.21		5.2	J-	86000	J	3.1		2.7		264	
CC22D	Henrietta Mine Upstream	9/29/2016	6880	J	2.1	J	63.3	J	35.2	J	0.17	J	3.5	J	1010	J	1.9		2.1	J	61.4	J
CC22B	Henrietta Mine Midpoint	9/29/2016	8670	J	6.2	J	77.5	J	148	J	0.13	J	0.84		283	J	3.8		2.3	J	46.7	J
CC24B	Henrietta Mine Downstream	9/29/2016	5430	J	2.8	J	59.8	J	224	J	0.12	J	0.053	U	3.5	U	3.8		2.4		28	J
WR-CC37	Anglo Saxon Mine Lower Waste Rock (10 sieve)	7/27/2016	10400	J	3.3	J-	41.8		118		0.48		0.42	J-	803	J	4.4		35.5		71.4	
WR-CC37	Anglo Saxon Mine Lower Waste Rock (60 sieve)	7/27/2016	11200	J	3.4	J-	45		118		0.49		0.53	J-	777	J	3.9		23.7		96.1	
WR-CC38B	Anglo Saxon Mine Upper Waste Rock (10 sieve)	7/27/2016	4230	J	58.7	J-	143		63.7		0.085	J	4.3	J-	2.9	UJ	1.2		1.2		283	
WR-CC38B	Anglo Saxon Mine Upper Waste Rock (60 sieve)	7/27/2016	4850	J	110	J-	232		103		0.13		2.3	J-	3	UJ	2		1.3		485	
CC39B	Anglo Saxon Mine Upstream	9/28/2016	9290	J	2.8	J	42.8	J	50.2		0.26	J	2.7		1160	J	5.1		5.1	J	122	J
CC38C	Anglo Saxon Mine In Porcupine Gulch	9/28/2016	11200	J	2.7	J	73.5	J	95.3		0.3	J	1.7		1470	J	1.4		8.1	J	93.9	J
CC38D	Anglo Saxon Mine In Porcupine Gulch	9/28/2016	9870	J	1.1	J	48.8	J	87.2		0.27	J	3.7		1120	J	2.2		5.5	J	76.5	J
CC38	Anglo Saxon Mine In Porcupine Gulch	9/28/2016	11000	J	0.82	J	46.3	J	106		0.27	J	0.66		1260	J	2.7		3.4	J	54.3	J
CC39	Anglo Saxon Mine Downstream	9/27/2016	9170	J	2.2	J	36.4	J	48.8		0.14	J	1		887	J	4.5		3.1	J	61.7	J
WR-CC43	Yukon Tunnel Waste Rock	7/27/2016	9750	J	13	J-	51.8		52.3		0.083	J	3.5	J-	4160	J	3.4		4.2		2580	
CC41	Yukon Tunnel Upstream	9/27/2016	9410	J	3.5	J	45.2	J	60.3		0.22	J	2.1		779	J	4.4		4.9	J	77.9	J
CC43E	Yukon Tunnel Downstream	9/27/2016	8380	J	3.7	J	57.2	J	63		0.16	J	0.82		635	J	5		3.5	J	48.9	J
CC42	Yukon Tunnel in Illinois Gulch	9/27/2016	8230	J	1.8	J	7.3	J	106		0.11	J	0.47	J	1060	J	4		3.2	J	58.2	J
CC43D	Yukon Tunnel Pond	9/27/2016	14800	J	1	J	31.8	J	109		0.29	J	0.29	J	2570	J	9.2		8.8	J	93.3	J

Notes:

Waste rock samples are indicated by a "WR" in the sample location name

CC - Cement Creek

U - Indicates compound was analyzed for, but not detected in sample

UJ - The analyte was analyzed for, but was not detected. The reported value is approximate and may be inaccurate or imprecise

J - Indicates an estimated value. The associated numerical value is the approximate concentration of the analyte in the sample

J- - Indicates an estimated value. The associated numerical value is the approximate concentration of the analyte in the sample, likely to have a low bias

mg/kg - milligrams per kilogram

"--" - no data available

"U" samples are reported as the method detection limit

Attachment B

Total Recoverable Metals Concentrations for 2015 and 2016 EPA/ESAT Waste Rock and Soil Samples

Bonita Peak Mining District, San Juan County, Colorado

Preliminary Remedial Investigation Report

Sample Location	Waste Rock/Soil Sample Location	Sample Date	Aluminum		Antimony		Arsenic		Barium		Beryllium		Cadmium		Calcium		Chromium		Cobalt		Copper	
Animas River																						
A07E	oston Mine Upstream	10/5/2016	13600	J	5.4	J	114		85	J	1.2		3.3		431	J	6.6		36.2	J	175	J
WR-BSN	oston Mine Waste Rock	7/26/2016	3270		81.1	J	245		191	J	0.11	J	15.8	J	3.1	U	1.3		0.5	J	81.8	
A07D	oston Mine Downstream	10/5/2016	21700	J	0.045	UJ	59.2		80.1	J	1		3.2		1050	J	5.4		8.8	J	59.2	J
WR1-LND	London Mine Waste Rock 1	7/26/2016	3240		99.3		94		73		0.085	J	17.8	J	3	U	2.3		0.74		166	
WR2-LND	London Mine Waste Rock 2	7/26/2016	4980		87.9		169		52.5		0.19	J	33.3	J	719		1.7		2.1		143	
AE18	London Mine Waste Rock 3	8/5/2015	1130	J	155	J-	119	J	48.1	J	0.004	UJ	34.7	J	111	J	0.76	J	0.75	J	197	J
A07B	London Mine Downstream	9/30/2016	48300		3.2	J	34.7		41.9		2.9		7		7.6	UJ	1.7	J	25		208	
WR-	en utler Mine Waste Rock	7/26/2016	6720		128	J	207		58.6	J	0.14		29.3	J	3.1	U	2.1		0.97	J	435	
?	en utler Mine Downstream	10/5/2016	14700	J	0.038	UJ	60.1		75	J	0.46	J	0.99		1600	J	4.9		4.4	J	21.9	J
AE1	Mountain Queen Upper Shaft	8/5/2015	1920	J	332	J-	227	J	182	J	0.004	UJ	95.8	J	104	UJ	1	J	0.26	J	664	J
AE2	Mountain Queen Adit	8/5/2015	1010	J	27.5	J-	106	J	150	J	0.004	UJ	2.5	J	132	J	0.61	J	0.27	J	117	J
AE9A	Vermillion Mine Waste Rock	7/27/2016	2610		20		147		59.3		0.16		23.8	J	2.9	U	1		0.27		213	
CG6	Vermillion Mine Downstream	9/30/2016	25400		0.047	UJ	29.9	J	39.9	J	6.1		1.6	J	2930		5.8	J	15.2	J	156	J-
AE44	Sunbank Group Mine Upper Adit	8/6/2015	5310	J	101	J-	148	J	77	J	0.64	J	1.1	J	183	UJ	4.9	J	18.7	J	422	J
AE45	Sunbank Group Mine	8/6/2015	6350	J	50	J-	109	J	93.4	J	0.49	J	2.7	J	242	UJ	4.1	J	21.5	J	270	J
AE46	Sunbank Group Mine Waste Rock	8/6/2015	7580	J	7.7	J-	170	J	115	J	0.005	UJ	0.68	J	503	UJ	6.1	J	34.9	J	246	J
A22	Sunbank Group Mine Upstream	9/30/2016	21200		3.1	J	44.8	J	169	J	2.8		9.8	J	3.7	U	6.7	J	13.4	J	318	J-
A21	Sunbank Group Mine Downstream	9/30/2016	17000		5.8	J	79.3		87.9		2.2		5.7		4	UJ	4.2		12.3		518	
AE10	aglev Tunnel Waste Rock - North	8/5/2015	2910	J	13.8	J-	174	J	86.2	J	0.73	J	10	J	918	J	1.5	J	6.6	J	337	J
AE10A	aglev Tunnel Waste Rock - South	8/5/2015	3810	J	7.6	J-	150	J	91.9	J	0.004	UJ	14.9	J	2800	J	1.5	J	4.8	J	143	J
A13	aglev Tunnel Upstream	9/30/2016	15800		12	J	41.2	J	113	J	1.7		15.9	J	2530		4.1	J	6.5	J	466	J-
CG9	aglev Tunnel Downstream	9/30/2016	16900		6.1	J	176	J	357	J	9		216	J	10800		3.4	J	63.6	J	2890	J-
GC-OPP	aglev Tunnel - North of Mine	7/27/2016	17800		0.57		30.4	J-	105		0.97		0.98		4120		7.7		8.3		26.9	
AE13	Columbus Mine Waste Rock	8/4/2015	6000	J	5.6	J-	91.9	J	38.3	J	0.004	UJ	6.4	J	1170	J	5	J	5.8	J	512	J
CG11	Columbus Mine Upstream	9/30/2016	15500		4	J	41.7	J	59.3	J	1		5.9	J	2410		5.2	J	8.8	J	182	J-
A10	Columbus Mine Downstream	9/29/2016	12800	J	3.9	J	60.2	J	72	J	0.38	J	1.3		1540	J	5.9	J	6.3	J	141	J+
CMP7	Campground 7	7/26/2016	13300		42.5		86.9	J-	180		0.8		10.6		3620		8.1		5.9		339	
AE32A	Silver Wing Mine	8/4/2015	1480	J	273	J-	702	J	24.6	J	0.004	UJ	10.5	J	553	J	2.7	J	2.2	J	3830	J
AE32B	Silver Wing Mine	8/4/2015	1310	J	273	J-	729	J	86.3	J	0.004	UJ	8.6	J	214	J	0.97	J	0.84	J	2530	J
WR-TM	Tom Moore Mine	7/27/2016	4690		14.9	J	361		30.8	J	0.13	J	7.6	J	1060	J	1.6		0.71	J	106	J
E4	en Franklin Mine	8/4/2015	3610	J	12.6	J	57.3	J	40.4	J	0.1	J	6.4	J	957	J	2.9	J	3.8	J	475	J
EG3A	en Franklin Mine Upstream	9/29/2016	17300	J	1.2	J	17.4	J	48	J	0.74		0.71		3890	J	8.8	J	18	J	96.9	J+
EG5	en Franklin Mine Downstream	9/28/2016	18100		1.2	J-	42.4		108	J	0.84		4.9	J	2790		7.7		14	J	192	J
A39	Terry Tunnel Upstream	9/28/2016	17700		2	J-	18.6		70.1	J	0.98		12.2	J	3890		5.9		15.7	J	456	J
EG6	Terry Tunnel Downstream	9/28/2016	16000		2.4	J-	31.7		85.3	J	0.86		11	J	2760		6.3		17.3	J	439	J
WR-PWN	Pride of the West Mine North	7/27/2016	7420		4		27.8		34.9		0.97		39.7		26800	J	3.3		9.1		906	J
WR-PWS	Pride of the West Mine South (10 sieve)	7/27/2016	9090		33.7		85.7		61.8		0.86		46.8		14600	J	5.4		10.6		1640	J
WR-PWS	Pride of the West Mine South (60 sieve)	7/27/2016	10300		18.5		113		77.8		1.1		54.9		8630	J	8.2		13.8		1540	J
CU4	Pride of the West Upstream	9/28/2016	10500	J	0.035	UJ	23.4		28.9		0.047	U	2.2		2490	J	2.4	J	5		105	J
CU4A	Pride of the West Downstream	9/28/2016	13000	J	3.8	J	9.2		115		0.049	U	2		4610	J	4.8	J	9.3		47.2	J
CMP4	Campground 4	7/26/2016	8550		46.8		62.9	J-	75.7		0.32		94.3		2310		4.3		9		2510	

Notes:

Waste rock samples are indicated by a "WR" in the sample location name

CC - Cement Creek

U - Indicates compound was analyzed for, but not detected in sample

UJ - The analyte was analyzed for, but was not detected. The reported value is approximate and may be inaccurate or imprecise

J - Indicates an estimated value. The associated numerical value is the approximate concentration of the analyte in the sample

J- - Indicates an estimated value. The associated numerical value is the approximate concentration of the analyte in the sample, likely to have a low bias

mg/kg - milligrams per kilogram

"-" - no data available

"U" samples are reported as the method detection limit

Attachment B  
Total Recoverable Metals Concentrations for 2015 and 2016 EPA/ESAT Waste Rock and Soil Samples  
Bonita Peak Mining District, San Juan County, Colorado  
Preliminary Remedial Investigation Report

Sample Location	Waste Rock/Soil Sample Location	Sample Date	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc											
			Mineral Creek																						
WR-M02B	Longfellow Mine Waste Rock	7/28/2016	45700	J	3680		1760	J	528	J	0.56		5.2	J	4.7		1.9	J	27.2	J-	0.54		11		1340
WR-M02D	Junction Mine Waste Rock	7/28/2016	75900	J	10200		2820	J	388	J	7.6		1.7	J	10.3		6	J	35.9	J-	0.89		27.3		1980
WR-M02C	Koehler Tunnel Waste Rock (10 sieve)	7/28/2016	160000	J	3740		2910	J	1700	J	3		4.6	J	2.1	U	3	J	14.6	J-	3.4		70.3		910
WR-M02C	Koehler Tunnel Waste Rock (60 sieve)	7/28/2016	203000	J	2930		4180	J	1330	J	1.8		6.7	J	5.4	U	2.8	J	10.4	J-	7.3		107		911
M02E	Junction Mine / Koehler Tunnel Pond	10/7/2016	28200		217		3170		668		0.11		0.95	J	4.3		1.3	J	0.98		0.042	U	17.7		405
M02	Junction Mine / Koehler Tunnel Downstream	10/7/2016	33900		53.7		5690		981		0.092	J	0.68	J	5.5		1.2	J	0.036	U	0.051	U	24.7		135
WR-M12	rooklvn Mine Adit Waste Rock	7/28/2016	47200	J	1920		4020	J	571	J	0.14		6.5		4.3		1.9	J	14.3	J-	0.32		19		145
WR1-M12	rooklvn Mine Waste Rock #1	7/28/2016	51400		2950	J	2070		422		0.2		5.4		2.9		2		27	J	0.4		13.6		903
WR2-M12	rooklvn Mine Waste Rock #2	7/28/2016	65100		1310	J	5720		847		0.0034	U	2.3		4.8		1.2		6.2	J	0.28		22.4		311
M12C	rooklvn Adit	9/30/2016	56200		3370		3730		456		1.2	J+	3.8		2.6		2	J	18.2		0.047	U	18.6		763
M12D	rooklvn Drainage Channel	9/30/2016	48500		405		3260		1750		0.067	J+	1.6	J	8.9		1.8	J	2.8		0.044	U	27.1		314
M12E	rooklvn Drainage Channel	10/7/2016	41900		100		9480		1900		0.011	J	0.79	J	5.3		1	J	0.031	U	0.044	U	20.8		186
M12A	rooklvn Drainage Channel Downstream	9/30/2016	32300	J	62.5		2210		764		0.035	J	1.2	J	7.7	J	1.6	J	1	J-	0.051	U	22.8		88.3
M12B	rooklvn Mine Upstream in rowns Gulch	9/30/2016	27400	J	48.1		1030		251		0.05	J	0.7	J	1.8	J	1	J	0.032	U	0.044	U	10.1		55.6
M12	rooklvn Mine Downstream in rowns Gulch	9/29/2016	40900	J	241		6170		3520		0.075	J	2.9		12.3	J	2.1	J	0.033	UJ	0.047	U	25.9		446
WR1-M24	andora Mine Waste Rock #1	7/28/2016	50200		14700	J	2110		15700		0.37		38.8		11.8		3		92.4	J	0.16		11.8		12800
WR2-M24	andora Mine Waste Rock #2	7/28/2016	64700		24400	J	967		1040		0.49		36.9		1.6		7.7		40.4	J	0.18		19.7		11100
WR3-M24	andora Mine Waste Rock #3	7/28/2016	23500		23200	J	1990		15100		0.71		48.8	J	8.2	J	3.3		48.4	J	0.2		8.3		66800
WR4-M24	andora Mine Waste Rock #4	7/28/2016	126000		2450	J	2360		72100		0.0049	U	25		34.6		3		5.9	J	0.33		20.6		16600
M24D	andora Mine Drainage into South Fork	9/27/2016	31300	J	349		6480		6020	J	0.039	J	2.5		10.2	J	1.5	J	1.6		0.042	U	22.5	J	4120
M23	andora Mine Upstream	9/27/2016	23700	J	19		5620		380	J	0.026	J	2.2	J	7.1	J	1.2	J	0.035	U	0.049	U	26.1	J	88.7
M25	andora Mine Downstream	9/27/2016	17300	J	55.3		4060		709	J	0.039	J	1	J	5.5	J	0.96	J	0.036	U	0.051	U	23.1	J	174
			Cement Creek																						
WR-CC01C	Grand Mogul Mine Waste Rock 1	7/27/2016	40800		19900	J	2410		977		1.4		6.3	J	1.1	J	4		32.1	J	0.44		19.8		17900
WR-CC01C2	Grand Mogul Mine Waste Rock 2	7/27/2016	30800		12800	J	1030		670		1.5		15.4	J	0.78	J	4.4		26.2	J	0.45		10.4		14700
WR-CC02A	Grand Mogul Mine Western Waste Rock	7/27/2016	24300	J	5140		847	J	382	J	0.45		25		0.49		3.8	J	19.7	J-	0.39		9.9		3510
CC01F	Grand Mogul Mine Upstream	9/28/2016	27200		462	J	5070		1670		0.062	J+	4.5		4.9	J	1	J	1.2		0.049	U	16.9		173
CC01C	Grand Mogul Mine below Waste Rock 1	9/28/2016	32700		1150	J	4650		1560		0.31	J+	4.8		3.3	J	1	J	3.1		0.05	U	17.4		280
CC01C1	Grand Mogul Mine below Waste Rock 2	9/28/2016	26000		1080	J	3050		2460		0.1	J+	1.8	J	4.1	J	1.1	J	2.9		0.06	U	12.6		737
CC01C2	Grand Mogul Mine before Confluence with CC	9/28/2016	33600		1650	J	6730		35900		0.041	J+	3.2		19	J	3.3	J	3.4		1		19.8		5560
CC01H	Grand Mogul Mine after Confluence with CC	9/27/2016	34000		896	J	4750		6960		0.059	J+	2.5	J	7.2	J	1.8	J	1.8		0.056	U	18.1		629
CC02I	Grand Mogul Western Waste Rock Channel	9/27/2016	36100	J	930		4050	J	3910		0.055	J	2.8		6.2		1.3	J	1.6		0.053	U	27.7	J	567
CC01U	Grand Mogul Mine Downstream in CC	9/27/2016	39400	J	711		6850	J	4130		0.038	J	7.9		5		2.4	J	4.2		0.048	U	21.4	J	642
WR-CC14A	Natalie/Occidental Mine Waste Rock 1	7/27/2016	38300	J	484		6060	J	614	J	0.0033	U	6.3		3.4		3.9	J	4	J-	0.21		30.5		310
WR-CC14B	Natalie/Occidental Mine Waste Rock 2	7/27/2016	59800	J	845		3040	J	712	J	0.18		37.9		1.8		5.3	J	12.5	J-	0.24		24.9		223
CC15	Natalie/Occidental Mine Upstream	9/29/2016	41900	J	78.6	J	3270	J	453	J	0.012	J	3.1		1.4		2	J	0.032	UJ	0.045	U	18.8		53.7
CC15A	Natalie/Occidental Mine Downstream	9/29/2016	37700	J	259	J	3080	J	359	J	0.027	J	6.7		1.9		2.4	J	1.5	J	0.044	U	17.1		146
WR-CC22	Henrietta Mine Waste Rock	7/27/2016	27200	J	6700		11500	J	366	J	0.31		0.91		3.7		4.8	J	13.8	J-	0.27		11.5		4320
CC22D	Henrietta Mine Upstream	9/29/2016	42100	J	568	J	1970	J	289	J	0.096	J	0.91	J	1.3		1.6	J	1.3		0.041	U	12.1		898
CC22B	Henrietta Mine Midpoint	9/29/2016	46500	J	617		2790	J	204	J	0.12		1.7	J	1.6	J	2.9		5.8	J	0.044	U	19.8		352
CC24B	Henrietta Mine Downstream	9/29/2016	26900	J	165	J	1470		190	J	0.028	J	1.7	J	1.8		2.4	J	0.9		0.048	U	20.4		35
WR-CC37	Anglo Saxon Mine Lower Waste Rock (10 sieve)	7/27/2016	87200	J	785		4620	J	3780	J	0.0035	U	10.9		3.6		4.5	J	4	J-	0.3		31.5		283
WR-CC37	Anglo Saxon Mine Lower Waste Rock (60 sieve)	7/27/2016	122000	J	959		3660	J	3810	J	0.12		12.3		3		5.8	J	3.8	J-	0.24		26.7		414
WR-CC38B	Anglo Saxon Mine Upper Waste Rock (10 sieve)	7/27/2016	61000	J	3340		1300	J	300	J	0.42		22.6		0.67		10.1	J	14.2	J-	0.46		13.8		1650
WR-CC38B	Anglo Saxon Mine Upper Waste Rock (60 sieve)	7/27/2016	77400	J	4650		1040	J	177	J	0.56		36.5		1.1		13.1	J	22.8	J-	0.66		25		2240
CC39B	Anglo Saxon Mine Upstream	9/28/2016	70500	J	626		4640	J	764	J	0.042	J	4.9		2.9	J	2.2	J	2.6		0.048	U	34.6		904
CC38C	Anglo Saxon Mine In Porcupine Gulch	9/28/2016	40500	J	1480		4850	J	1150	J	0.031	J	1.8	J	1.9	J	2.6	J	3.5		0.048	U	16.7		546
CC38D	Anglo Saxon Mine In Porcupine Gulch	9/28/2016	42700	J	890		3510	J	926	J	0.073	J	1.5	J	2	J	1.7	J	2.3		0.041	U	16.6		638
CC38	Anglo Saxon Mine In Porcupine Gulch	9/28/2016	40300	J	540		3930	J	585	J	0.047	J	1.8	J	2.3	J	1.3	J	1.5		0.083	U	17.3		285
CC39	Anglo Saxon Mine Downstream	9/27/2016	57400	J	414		4920	J	650	J	0.02	J	2.6		2.3	J	1.4	J	1.6		0.04	U	27.2		577
WR-CC43	Yukon Tunnel Waste Rock	7/27/2016	69800	J	3160		2700	J	711	J	0.26		45.8		3.5		13.4	J	16.3	J-	0.38		23.8		844
CC41	Yukon Tunnel Upstream	9/27/2016	56600	J	621		5200	J	575	J	0.041	J	3.9		3	J	2.2	J	2.5		0.044	U	29.6		502
CC43E	Yukon Tunnel Downstream	9/27/2016	53100	J	343		4030	J	583	J	0.032	J	2.7		2.3	J	1.7	J	5.1		0.043	U	27.8		765
CC42	Yukon Tunnel in Illinois Gulch	9/27/2016	27200	J	422		3410	J	385	J	0.29		4.8		3.2	J	3.8	J	1.3		0.042	U	21.4		101
CC43D	Yukon Tunnel Pond	9/27/2016	65700	J	205		7660	J	960	J	0.028	J	3		6.5	J	2.1	J	0.99		0.044	U	20.9		177

Notes:

Waste rock samples are indicated by a "WR" in the sample location name  
CC - Cement Creek  
U - Indicates compound was analyzed for, but not detected in sample  
UJ - The analyte was analyzed for, but was not detected. The reported value is approximate  
J - Indicates an estimated value. The associated numerical value is the approximate value  
J- - Indicates an estimated value. The associated numerical value is the approximate value

mg/kg - milligrams per kilogram  
"--" - no data available  
"U" samples are reported as the method detection limit

Attachment B  
Total Recoverable Metals Concentrations for 2015 and 2016 EPA/ESAT Waste Rock and Soil Samples  
Bonita Peak Mining District, San Juan County, Colorado  
Preliminary Remedial Investigation Report

Sample Location	Waste Rock/Soil Sample Location	Sample Date	Iron		Lead		Magnesium		Manganese		Mercury		Molybdenum		Nickel		Selenium		Silver		Thallium		Vanadium		Zinc	
			Animas River																							
A07E	oston Mine Upstream	10/5/2016	106000	J	505	J	1340	J	7540	J	0.054	J	29.1		3.4	J	2.5	J	4.1		3.3		12.4		434	J
WR-BSN	oston Mine Waste Rock	7/26/2016	25900		4660	J	2.2	U	122		1.7		118	J	0.68	J	0.99		22.4	J	2.3		4.5		4450	
A07D	oston Mine Downstream	10/5/2016	23000	J	487	J	3800	J	2710	J	0.051	J	3.7		5.2	J	1.9	J	2		0.057	U	16.7		818	J
WR1-LND	London Mine Waste Rock 1	7/26/2016	28900		3300	J	2.2	U	161		0.6		16.2		1		2.9		16.9	J	0.63		5.7		2250	
WR2-LND	London Mine Waste Rock 2	7/26/2016	25000		5490	J	1570		713		0.53		48.9		1.3		1.4		35.4	J	2		12		7690	
AE18	London Mine Waste Rock 3	8/5/2015	14600	J	5660	J	277	J	107	J	0.66		--	--	1.2	J	2.2	J	47.4	J	2	J	4.5	J	9680	J
A07B	London Mine Downstream	9/30/2016	36800		561		1640	J	10700		0.056	J	7.4		3.8		2.4	J	1.9		0.1	U	4.6	J	546	J
WR-	en utler Mine Waste Rock	7/26/2016	35500		24000	J	995		194		0.77		49.8	J	0.97	J	1.2		93.7	J	2.3		10		20200	
	en utler Mine Downstream	10/5/2016	22900	J	473	J	3030	J	910	J	0.028	J	2.2	J	4	J	0.92	J	1.2		0.048	U	19.5		328	J
AE1	Mountain Queen Upper Shaft	8/5/2015	32000	J	35700	J	30.2	J	54.3	J	1.5		--	--	0.35	J	32.3	J	16	J	0.003	UJ	5.4	J	12400	J
AE2	Mountain Queen Adit	8/5/2015	15700	J	1950	J	157	J	258	J	1.8		--	--	0.31	J	2.3	J	49.6	J	0.003	UJ	3.1	J	621	J
AE9A	Vermillion Mine Waste Rock	7/27/2016	25800		10400	J	2.1	U	60.4		1.1		41.2		0.42		2.9		45.1	J	1		5.1		8520	
CG6	Vermillion Mine Downstream	9/30/2016	40100	J	162		9250	J	7020	J	0.038	J	4.7		7.4	J	2.5	J	0.042	U	0.06	U	32.5		813	
AE44	Sunbank Group Mine Upper Adit	8/6/2015	47500	J	2040	J	847	J	3080	J	0.2		--	--	3.1	J	0.092	UJ	20.1	J	2.8	J	17.7	J	496	J
AE45	Sunbank Group Mine	8/6/2015	55100	J	2210	J	1310	J	8240	J	0.24		--	--	2.8	J	0.2	UJ	20.3	J	4.6	J	14.9	J	640	J
AE46	Sunbank Group Mine Waste Rock	8/6/2015	102000	J	631	J	1750	J	12800	J	0.26		--	--	2.6	J	0.12	UJ	8.7	J	6	J	24.7	J	295	J
A22	Sunbank Group Mine Upstream	9/30/2016	24000	J	1500		3270	J	19600	J	0.16		4.7		6.5	J	2.6	J	4.2		0.78		21.4		1600	
A21	Sunbank Group Mine Downstream	9/30/2016	37000		3390		3200	J	4270		0.86		7.8		3.6		3.4	J	10.4		0.11	U	13.8		1460	J
AE10	aglev Tunnel Waste Rock - North	8/5/2015	33800	J	7040	J	1050	J	4040	J	1.2		--	--	2.4	J	0.17	UJ	27.1	J	1.4	J	8.1	J	1980	J
AE10A	aglev Tunnel Waste Rock - South	8/5/2015	37600	J	3400	J	1760	J	2640	J	0.82		--	--	1.2	J	0.083	UJ	17.3	J	1.1	J	7.4	J	3200	J
A13	aglev Tunnel Upstream	9/30/2016	28900	J	6000		4490	J	14800	J	2.6		12.9		4.6	J	2.1	J	21.8		0.063	U	14.9		2100	
CG9	aglev Tunnel Downstream	9/30/2016	69700	J	1730		1550	J	55900	J	0.2	J	81.8		53.1	J	5.9	J	5.9		0.11	U	8.6		30200	
GC-OPP	aglev Tunnel - North of Mine	7/27/2016	23700	J	151		4710		1700		0.0036	U	5.4		5.3		0.92		0.84		0.2		23.1		327	
AE13	Columbus Mine Waste Rock	8/4/2015	41700	J	6060	J	3570	J	1160	J	0.74		--	--	3.8	J	0.17	UJ	17.7	J	0.81	J	20.1	J	1750	J
CG11	Columbus Mine Upstream	9/30/2016	29300	J	1300		6190	J	6080	J	1.2		6.3		4.6	J	1.8	J	5.2		0.047	U	19.5		857	
A10	Columbus Mine Downstream	9/29/2016	40500	J	1870	J	6420	J	2350	J	0.64		16.3		3.6	J	1.2	J	5.9		0.041	U	20.3		404	J
CMP7	Campground 7	7/26/2016	23500	J	11800		4200		1560		0.29		6.4		5.1		2.9		26.7		0.43		24.4		5290	
AE32A	Silver Wing Mine	8/4/2015	43400	J	7010	J	886	J	357	J	0.17		--	--	1.9	J	4.3	J	16	J	0.003	UJ	12.4	J	1340	J
AE32B	Silver Wing Mine	8/4/2015	38600	J	4710	J	516	J	289	J	0.51		--	--	0.73	J	3	J	17.6	J	0.003	UJ	10.7	J	1970	J
WR-TM	Tom Moore Mine	7/27/2016	42400		8180		852	J	837	J	0.14		159	J	0.67	J	1.1		10.4	J	1.9		11.4		3080	
E4	en Franklin Mine	8/4/2015	49100	J	6770	J	2300	J	1130	J	0.47		--	--	2.6	J	1.7	J	34.8	J	0.37	J	15.6	J	2870	J
EG3A	en Franklin Mine Upstream	9/29/2016	55600	J	605	J	9260	J	1620	J	0.23		2.1		10	J	2.2	J	4.9		0.041	U	39.2		282	J
EG5	en Franklin Mine Downstream	9/28/2016	65400		730	J	8550	J	5830	J	0.046	J	6.1		8.8	J	2.8		4.9	J	0.04	U	32.7		1050	
A39	Terry Tunnel Upstream	9/28/2016	60100		1010	J	10100	J	9450	J	0.055	J	9.5		11.5	J	3		7.6	J	0.042	U	25.9		3640	
EG6	Terry Tunnel Downstream	9/28/2016	67000		1770	J	8530	J	15100	J	0.11	J	5.2		9.2	J	2.3	J	5.8	J	0.044	U	27.8		3450	
WR-PWN	Pride of the West Mine North	7/27/2016	25200		13900		5290	J	5450	J	0.0033	U	101		4.5		3		12.9		0.23		9		9920	
WR-PWS	Pride of the West Mine South (10 sieve)	7/27/2016	42700		16300		5830	J	5860	J	0.27		82.4		5.5		1.2		50.4		0.29		14		12100	
WR-PWS	Pride of the West Mine South (60 sieve)	7/27/2016	50600		26700		5260	J	6580	J	0.55		91.7		7		2		49.3		0.38		16.6		13100	
CU4	Pride of the West Upstream	9/28/2016	21800	J	1760		4570	J	2210	J	0.015	J	7.1		2.3	J	1	J	2		0.045	U	9.3		665	J
CU4A	Pride of the West Downstream	9/28/2016	30200	J	820		5120	J	1260	J	0.012	J	4.4		3.9	J	1.9	J	2.4		0.046	U	32.1		458	J
CMP4	Campground 4	7/26/2016	37400	J	44200		3150		910		6		118	J	2.8		7.1		96.9		0.3		15.4		17300	

Notes:  
Waste rock samples are indicated by a "WR" in the sample location name  
CC - Cement Creek  
U - Indicates compound was analyzed for, but not detected in sample  
UJ - The analyte was analyzed for, but was not detected. The reported value is approximate and may be inaccurate or imprecise  
J - Indicates an estimated value. The associated numerical value is the approximate concentration of the analyte in the sample  
J- - Indicates an estimated value. The associated numerical value is the approximate concentration of the analyte in the sample, likely to have a low bias

mg/kg - milligrams per kilogram  
"--" - no data available  
"U" samples are reported as the method detection limit



**APPENDIX B**  
**RISK ASSESSMENT INFORMATION**

**APPENDIX B – PART 1.1A**  
**RISK ESTIMATES FOR TRESPASS CAMPING SCENARIOS AT**  
**DISPERSED CAMPSITES**



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 8**

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October 4, 2018

**MEMORANDUM**

**SUBJECT:** Final Risk Estimates for Trespass Camping Scenarios at Dispersed Campsites within the Bonita Peak Mining District (BPMD) Superfund Site

**FROM:** Steven B. Merritt  
Industrial Hygienist/Risk Assessor

**TO:** Rob Parker  
Remedial Project Manager

The purpose of this memorandum is to provide a discussion of the human health risks associated with limited-duration trespass camping scenarios on dispersed campsites within the Bonita Peak Mining District (BPMD) located in southwestern Colorado. Landownership within the BPMD includes government owned land as well as some parcels that are private property. This memorandum is in response to public comments that question the validity of including private lands or inholdings within the BPMD that have documented seasonal use as dispersed campsites in the risk evaluations developed for the BPMD Final Focused Feasibility Study (FFS) for Interim Remedial Actions (CDM Smith 2018). The risk evaluation presented in Appendix B of the FFS includes a dispersed camping scenario consisting of an exposure frequency of 14 days per year. In response to the public comments on this exposure frequency assumption, an alternate trespass camping scenario was evaluated to determine whether heavy metals (lead in particular) may pose an unacceptable risk under a shorter exposure frequency scenario. This alternate scenario evaluated an exposure frequency of 2 days per year for campers in dispersed campsites to determine if levels of lead pose a risk above a level of concern. This change would account for a family camping with a child (under the age of 6 years) present that unknowingly uses unmarked private property within the BPMD as a campsite before being discovered and asked to leave by the property owner.

Previous investigations have concluded that historic mining activities in the BPMD have impacted soil, sediment, surface water, and groundwater in the area with elevated concentrations of heavy metals, such as lead and arsenic, that exceed human health screening levels for residents and industrial workers (EPA 2018). For the 13 dispersed campsites identified and sampled within the BPMD, lead concentrations in soil range from less than 100 mg/kg to greater than 50,000 mg/kg, with an average of approximately 6,400 mg/kg. The highest value observed was in “dispersed campsite 4”, which is the commenter’s private property.

Concern over health effects from elevated blood lead levels is greatest for young children or the fetus of pregnant women. There are several reasons for this focus on young children or the fetus, including the following: children are often more vulnerable to pollutants than adults due to differences in behavior and biology that can lead to greater exposure and/or unique windows of susceptibility during development, soil ingestion rates for young children are higher than adults due to increased frequency of contact through hand-to-mouth or object-to-mouth activity, and lead is particularly harmful to the developing brain and nervous system of fetuses and young children.

EPA recommends the use of toxicokinetic models to correlate blood lead concentrations with exposure and adverse health effects. EPA recommends the use of the Integrated Exposure Uptake Biokinetic (IEUBK) model to evaluate exposures from lead-contaminated media in children in a residential setting (EPA 1994) and the Adult Lead Methodology (ALM) to evaluate potential risks from lead exposure in adults (females of childbearing age) (EPA 2016). Both the IEUBK model and the ALM can be used to predict blood lead concentrations in exposed individuals and estimate the probability of a blood lead concentration exceeding a level of concern. Unfortunately, for a trespass camping scenario, the IEUBK and ALM are not valid with exposure durations of less than 14 days, so a different approach was needed to estimate acute risks from lead exposures. Because acute recreational screening levels are not readily available for use to evaluate potential risks to campers in dispersed campsites, this memorandum will outline the process for developing these levels for lead.

EPA has recommended the use of the All Ages Lead Model (AALM) for evaluating short-term exposure scenarios. The AALM is still in development, however, a beta version (FORTRAN 1.0) of this model is available (upon EPA request) and was used in researching effects of lead exposures at various life stages to support the development of the acute screening levels. The version of the model used to derive acute lead screening values in this appendix was provided by EPA on March 13, 2018. The AALM was used to evaluate a “pulse” exposure occurring for 2 days by a child due to incidental ingestion of soil/waste rock encountered at a specific location (e.g., dispersed campsite). The model output includes predicted lead concentrations for specified time step intervals (e.g., daily) with interpolated changes between steps in various body compartments including the blood, plasma, kidney, liver, bone, etc. This output can be used to determine peak blood lead (PbB) concentrations following a pulse exposure.

**Table 1** presents the general input parameters used to derive acute screening levels for lead, recognizing that several of the assumptions may differ from those typically used in an evaluation of chronic exposure to lead.

**Table 1. General Parameters Used to Calculate the Acute Lead Screening Levels**

Parameter	Value	Source
Target PbB level (µg/dL)	19.5	EPA 2016
Maternal PbB level (µg/dL)	0.8	EPA 2017a
Default drinking water concentration (µg/L)	0.9	EPA 2017a
Background soil lead concentration (mg/kg)	66	Scribe database
RBA	0.6	EPA 2003
Receptor gender	Female	AALM model

mg/kg – milligrams per kilogram

PbB – blood lead

RBA – relative bioavailability

µg/dL – micrograms per deciliter

µg/L – micrograms per liter

The rationale for the selection of each input provided in **Table 1** is presented below:

- Target PbB level – An acute blood lead threshold of 20 micrograms per deciliter (µg/dL) was identified in Office of Land and Emergency Management (OLEM) Directive 9285.6-54, *Recommendations for Assessing Short-term Exposure Involving Lead at Superfund Sites* (EPA 2016). Per EPA (2016), a PbB level of 20 µg/dL could be considered as a short-term elevation in PbB that would trigger a response action. This is based on the interpretation of the Center for Disease Control (CDC) recommendation that PbB levels in the range of 20 to 44 µg/dL would result in a home visit by a public health agency within 24 hours of a referral from a physician (CDC 2012). For the purposes of this evaluation, 19.5 µg/dL was selected as target PbB for establishing an acute screening level, to account for rounding to two significant digits.
- Maternal PbB level – A maternal PbB level of 0.8 µg/dL was selected based the recommendation provided in OLEM Directive 9285.6-56 (EPA 2017b).
- Default drinking water concentration – A default lead drinking water concentration of 0.9 micrograms per liter (µg/L) was selected based the recommendation provided in the *Headquarters Lead Consultation Intake Form for the Colorado Smelter Superfund Site* (EPA 2017a).
- Background soil lead concentration – A background soil lead concentration of 66 milligrams per kilogram (mg/kg) was selected based on the mean soil lead concentration measured in upland reference soil collected within the BPMD.
- Relative bioavailability (RBA) – The default RBA of 60% recommended by EPA (2003) was selected. The implications of this assumption are discussed further below.
- Receptor gender – A female receptor was selected because female children have a lower body weight than male children (per default inputs in the AALM). A receptor with a lower body weight is more sensitive to exposure compared to a receptor with a higher body weight.



**Table 2** presents the scenario-specific input parameters used to derive the acute screening level for lead.

**Table 2. Scenario-Specific Parameters Used to Calculate the Acute Lead Screening Levels**

Parameter	Scenario 1 CTE Resident	Scenario 2 CTE Camping	Scenario 3 RME Camping	Source
Soil intake rate during pulse exposure (g soil/day)	0.094	0.367	1.592	EPA 2017a, EPA 2008 (Table 5-6)
Soil intake rate prior to pulse exposure (g soil/day)	0.086	0.094	0.094	EPA 2017a
Water intake rate (L water/day)	0.43	0.51	0.51	EPA 2017a
Diet intake rate (µg Pb/day)	5.03	5.21	5.21	EPA 2017a
Receptor age at first pulse exposure	1 year old (365 days)	2 years old (730 days)	2 years old (730 days)	EPA 2008 (Table 5-6)

CTE – central tendency exposure

g – grams

L – liter

Pb – lead

RME – reasonable maximum exposure

µg – micrograms

The rationale for the selection of each input provided in **Table 2** is presented below:

- Soil intake rate during pulse exposure – Multiple soil intake rates were selected for use in the model to present a range of acute screening levels. In each case, the most conservative soil intake rate available for each scenario was selected so that the most sensitive receptor was used in the model.
- Scenario 1 – The soil intake rate selected for a CTE resident was 0.094 grams per day (g/day). This value was selected because it is the highest intake rate provided in the *Headquarters Lead Consultation Intake Form for the Colorado Smelter Superfund Site* (EPA 2017a) for children under the age of 6 years. This value corresponds to a 1-year-old to 2-year-old receptor.
- Scenario 2 – The soil intake rate selected for a CTE child while camping was 0.367 g/day because this is the highest geometric mean intake rate provided in the *Child-Specific Exposure Factors Handbook* (EPA 2008, Table 5-6). This value corresponds to a 2-year-old to 3-year-old girl. The study upon which this value is based evaluated soil intake using a tracer element methodology for 78 children aged 1 to 5 years old at campgrounds (Van Wijnen et al. 1990).
- Scenario 3 – The soil intake rate selected for a RME child while camping was 1.592 g/day because this is the 95<sup>th</sup> percentile (computed using the reported geomean and geometric standard deviation) for the intake rates provided for the 2-year-old to 3-year-old girl (EPA 2008, Table 5-6).

- Soil intake rate prior to pulse exposure – The soil intake rate prior to the pulse selected for use in the model was the soil intake rate provided in the *Headquarters Lead Consultation Intake Form for the Colorado Smelter Superfund Site* (EPA 2017a) for the age group prior to the pulse. For Scenario 1, where the pulse occurs on day 365, the soil intake rate prior to the pulse was 0.086 g/day (soil intake rate for a 0-year old to 1-year old). Likewise, for Scenarios 2 and 3, where the pulse occurs on day 730, the soil intake rate prior to pulse was 0.094 g/day (soil intake rate for a 1-year old to 2-year old).
- Water intake rate – The drinking water intake rate selected for use in the model was 0.43 to 0.51 liters per day (L/day), depending on the scenario, based the recommended values provided in the *Headquarters Lead Consultation Intake Form for the Colorado Smelter Superfund Site* (EPA 2017a). The 0.43 L/day intake rate was applied to the 1-year old (Scenario 1), whereas the 0.51 L/day intake rate was applied to the 2-year old to 3-year old (Scenarios 2 and 3).
- Dietary intake rate – The dietary lead intake rate selected for use in the model was 5.03 to 5.21 micrograms per day (µg/day), depending on the scenario, based the recommended values provided in the *Headquarters Lead Consultation Intake Form for the Colorado Smelter Superfund Site* (EPA 2017a). The 5.03 µg/day intake rate was applied to the 1-year old (Scenario 1), whereas the 5.21 µg/day intake rate was applied to the 2-year old to 3-year old (Scenarios 2 and 3).
- Receptor age at first pulse exposure – The age at first pulse exposure was 365 days (1 year old) for Scenario 1 and 730 days (2 years old) for Scenarios 2 and 3.

**Table 3** presents the acute screening levels for lead that were derived based on the inputs and scenarios that have been described above. The acute screening levels were derived by determining (through iterative model runs) the soil/waste rock concentration that would result in a predicted peak PbB concentration of 19.5 µg/dL.

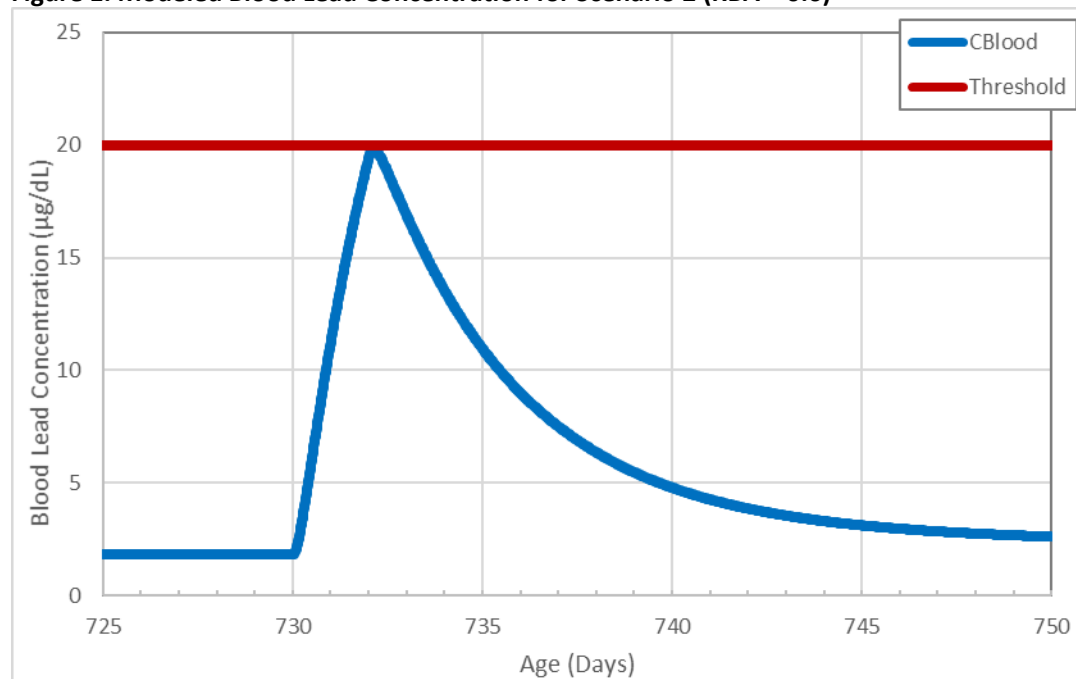
**Table 3. Acute Lead Screening Levels (mg/kg)**

Scenario	Screening Level (RBA = 0.6)
Scenario 1	8,036
Scenario 2	3,196
Scenario 3	737

mg/kg – milligrams per kilogram

For demonstration purposes, **Figure 1** presents a graphical display of the predicted PbB concentrations based on the acute screening levels developed for a 2-day exposure for Scenario 2. As seen, the predicted PbB concentrations rise sharply for the 2-day exposure to soils containing 3,196 mg/kg to reach the threshold of 19.5 µg/dL.

**Figure 1. Modeled Blood Lead Concentration for Scenario 2 (RBA = 0.6)**



µg/dL - micrograms per deciliter  
Cblood - concentration of lead in blood

**Table 4** presents a comparison of the acute lead screening levels based on a 2-day exposure for Scenario 3 with varying RBA values (0.60 versus 0.20) to demonstrate the potential difference in screening levels if a lower RBA value were used. As seen, the change in screening level is inversely proportional to the change in RBA; decreasing the RBA by a factor of 3 increases the screening level by a factor of 3.

**Table 4. Effect of Using a Different RBA Value on Acute Lead Screening Levels (mg/kg)**

Scenario	Screening Level (RBA = 0.2)
Scenario 1	24,108
Scenario 2	9,588
Scenario 3	2,210

mg/kg – milligrams per kilogram  
RBA – relative bioavailability

The concentration of lead at dispersed campsite 4 (51,714 ppm) is greater than the acute screening levels for all scenarios described above (regardless of the assumed ingestion rate). In addition, even if RBA values were at the lower end of the range possible (0.2), lead concentrations at dispersed campsite 4 are higher than screening levels.

This alternate exposure scenario evaluation indicates that, even if the exposure frequency were assumed to be only 2 days per year, lead concentrations at dispersed campsite 4 would still be well above risk-based recreational screening levels, which supports the conclusions of the FFS for this location.

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**APPENDIX B – PART 1.1B**  
**INTERIM CHRONIC LEAD RISK EVALUATION**

## Appendix B – Part 1.1

# Interim Chronic Lead Risk Evaluation

## 1.0 Introduction

This appendix describes an interim evaluation of potential lead risks from exposures to lead in soil/waste rock at the Bonita Peak Mining District Superfund Site (Site) located in southwestern Colorado. The Site consists of 48 historic mines or mining-related sources where ongoing releases of metal-laden water and sediments are occurring within the Mineral Creek, Cement Creek, and Upper Animas River drainages in San Juan County, Colorado. Drainages within the Site contain over 400 abandoned or inactive mines where large- to small-scale mining operations occurred. San Juan County is comprised of 10 historic mining districts (Colorado Geological Survey 2017). Historic mining districts within the Mineral Creek, Cement Creek, and Upper Animas River drainages (referred to as “the mining districts” in this appendix) include Animas, Animas Forks, Cement Creek, Eureka, Ice Lake Basin, and Mineral Point.

This interim lead risk evaluation was developed to support the identification of areas that may warrant interim remedial action in 2018. This evaluation is to be considered preliminary and subject to change pending completion of the Bonita Peak Mining District human health risk assessment (HHRA).

Lead was selected for evaluation because soil concentrations are notably elevated at several locations within the mining districts and lead is often an important human health risk driver for mining-related contamination. The camping scenario was selected for this evaluation because the camper receptor likely has the highest exposure to soil, due primarily to incidental ingestion of soil, compared to the other recreational receptors (e.g., hiker, hunter, recreational ATV rider) being considered in the HHRA. The camping scenario was also selected because this receptor includes exposures both as a young child and as an older child/adult. Children are often more vulnerable to pollutants than adults, particularly for lead exposures, because of differences in behavior and biology that can result in greater exposure and/or unique windows of susceptibility during development. Additionally, soil ingestion rates for young children are higher than adults due to increased frequency of contact through hand-to-mouth or object-to-mouth activity.

Potential risks to a variety of recreational and occupational receptor populations from all contaminants of interest (lead and nonlead) and all exposure media and pathways will be evaluated as part of the Bonita Peak Mining District HHRA.

## 2.0 Overview

Risks from lead are evaluated using a somewhat different approach than for most other chemicals. Because lead is widespread in the environment, exposure can occur from many sources. Thus, lead risks are usually based on consideration of total exposure (all sources) rather than just site-related sources. Additionally, because studies of lead exposures and resultant health effects in humans traditionally have been described in terms of blood lead level, lead exposures and risks typically are assessed by describing the levels of lead that may occur in the

blood of exposed populations and comparing these to blood lead levels of potential health concern. For convenience, the concentration of lead in blood is usually abbreviated PbB, and is expressed in units of micrograms of lead per deciliter of blood ( $\mu\text{g}/\text{dL}$ ).

Concern over health effects from elevated blood lead levels is greatest for young children or the fetuses of pregnant women. There are several reasons for this focus on young children or the fetus, including the following: (1) young children typically have higher exposures to lead-contaminated media per unit body weight than adults, (2) young children typically have higher lead absorption rates than adults, and (3) young children and fetuses are more susceptible to effects of lead than are adults. EPA has identified  $10 \mu\text{g}/\text{dL}$  as the concentration level at which effects begin to occur that warrant avoidance and has set as a goal that there should be no more than a 5% chance that a child will have a blood lead value above  $10 \mu\text{g}/\text{dL}$  (EPA 1994). The Centers for Disease Control (CDC) has identified  $5 \mu\text{g}/\text{dL}$  as a “reference level” for blood lead in children<sup>1</sup> (CDC 2012). This concentration corresponds to the 97.5<sup>th</sup> percentile of blood lead levels in children in the U.S. The EPA is in the process of evaluating the CDC recommendations and implications for Superfund risk assessments. Until this assessment is complete, EPA recommends that lead risk assessments consider current scientific conclusions, which have shown adverse health effects at levels less than  $10 \mu\text{g}/\text{dL}$  (EPA 2016). On this basis, this interim lead risk evaluation will employ a PbB threshold of  $5 \mu\text{g}/\text{dL}$ . For convenience, the probability of a blood lead value exceeding  $5 \mu\text{g}/\text{dL}$  is referred to as P5.

Although the PbB threshold is based on studies in young children, it is generally assumed that the same value is applicable to a fetus in utero. Available data suggest that the ratio of the blood lead level in a fetus to that of the mother is approximately 0.9 (Goyer 1990). Thus, the concentration of lead in blood in a pregnant female that would correspond to a PbB of  $5 \mu\text{g}/\text{dL}$  in the fetus is:

$$\text{PbB}(\text{mother}) = 5 \mu\text{g}/\text{dL} / 0.9 = 5.6 \mu\text{g}/\text{dL}$$

### 3.0 Lead Exposure Models and Parameters

EPA recommends the use of toxicokinetic models to correlate blood lead concentrations with exposure and adverse health effects. EPA recommends the use of the Integrated Exposure Uptake Biokinetic (IEUBK) model to evaluate exposures from lead-contaminated media in children in a residential setting (EPA 1994) and the Adult Lead Methodology (ALM) to evaluate potential risks from lead exposure in adults (females of childbearing age) (EPA 2003a). Both the IEUBK model and the ALM can be used to predict blood lead concentrations in exposed individuals and estimate the probability of a blood lead concentration exceeding a level of concern as described below.

#### 3.1 IEUBK Model

The IEUBK model developed by EPA predicts the likely range of blood lead levels in a population of young children (aged 0 to 84 months) exposed to a specified set of environmental lead levels (EPA 1994). This model requires as input data on the levels of lead in soil, dust, water, air, and diet at a location and on the amount of these media ingested or inhaled by a child living at that

<sup>1</sup> [http://www.cdc.gov/nceh/lead/ACCLPP/blood\\_lead\\_levels.htm](http://www.cdc.gov/nceh/lead/ACCLPP/blood_lead_levels.htm)

location. For the purposes of this interim lead risk evaluation, soil is the site-specific source medium of primary interest for interim actions.

All inputs to the IEUBK model are central tendency point estimates. These point estimates are used to calculate an estimate of the central tendency (the geometric mean) of the distribution of blood lead values that might occur in a population of children exposed to the specified conditions. Assuming the distribution is lognormal, and given (as input) an estimate of the variability between different children (this is specified by the geometric standard deviation [GSD]), the model calculates the expected distribution of blood lead values and estimates the probability that any random child might have a blood lead value over the set target blood lead level (i.e., 5 µg/dL).

### 3.2 ALM

The ALM (EPA 2003a, 2009), based on the work of Bowers et al. (1994), predicts the blood lead level in a person with a site-related lead exposure by summing the baseline blood lead level (PbB0) (that which would occur in the absence of any site-related exposures) with the increment in blood lead that is expected as a result of increased exposure due to contact with a lead-contaminated exposure medium. The latter is estimated by multiplying the average daily absorbed dose of lead from site-related exposures by a biokinetic slope factor (BKSF). Thus, the basic equation for exposure to lead in soil is:

$$\text{PbB} = \text{PbB0} + \text{BKSF} \cdot C_{\text{soil,adj}} \cdot \text{IR}_{\text{soil}} \cdot \text{AF}_{\text{soil}}$$

where:

PbB = Geometric mean blood lead concentration (µg/dL) in women of child-bearing age who are exposed to the site

PbB0 = Baseline geometric mean blood lead concentration (µg/dL) in women of child-bearing age in the absence of exposures to the site

BKSF = Biokinetic slope factor (µg/dL blood lead increase per microgram per day lead absorbed)

$C_{\text{soil,adj}}$  = Average lead concentration in soil expressed in units of micrograms per gram (µg/g), adjusted for the site-specific exposure frequency as described below in Section 3.3.2.

$\text{IR}_{\text{soil}}$  = Intake rate of soil expressed in units of grams per day (g/day)

$\text{AF}_{\text{soil}}$  = Absorption fraction of lead from soil (dimensionless)

As noted above, for the purposes of this interim lead risk evaluation, soil is the site-specific source medium of primary interest for interim actions; however, risks from all exposure media (soil, sediment, diet, water) will be evaluated as part of the Bonita Peak Mining District HHRA.

Once the geometric mean (GM) blood lead value in adult women who are exposed at the site is calculated, the full distribution of likely blood lead values in the population of exposed individuals can then be estimated by assuming the distribution is lognormal with a specified individual

geometric standard deviation ( $GSD_i$ ). The 95<sup>th</sup> percentile of the predicted distribution is given by the following equation (Aitchison and Brown 1957):

$$95^{th} = GM \cdot GSD_i^{1.645}$$

### 3.3 Evaluation of Intermittent Exposures

Both the IEUBK model and the ALM are designed to evaluate exposures that are approximately continuous (365 days per year). However, camper exposures are intermittent, occurring less than 365 days per year. When exposure is intermittent rather than continuous, the IEUBK model and ALM can still be used by adjusting the site-related exposure concentration that occurs during the exposure interval to a continuous exposure rate that yields the same total yearly exposure. However, this adjustment is reasonable only in cases where exposure occurs with a relatively constant frequency over a time interval long enough to establish an approximately steady-state response (EPA 2003b). Short-term exposures are not suitable for approximations as continuous exposures. To prevent applications of the lead models to exposure scenarios where an adjustment from intermittent to continuous exposure is not appropriate, EPA (2003b) recommends that these models only be applied to exposures that satisfy two criteria:

- The exposure frequency during the exposure interval is at least 1 day per week.
- The duration of the exposure interval is at least 3 consecutive months.

For the dispersed camper, the exposure frequency is based on the *Guidelines for the San Juan National Forest* (U.S. Forest Service [USFS] 2017). As stated in these guidelines, campers are permitted to camp in a National Forest for 14 days per month for 2 months. After they have been in the forest for 28 days, campers are to leave the National Forest. Thus, the maximum allowable camping time is 28 days per year. Lead risk assessments typically rely on central tendency exposure<sup>2</sup> (CTE) estimates. For the purposes of this interim lead risk evaluation, the exposure frequency was assumed to be one-half the maximum allowable time (14 days per year), with exposures occurring during consecutive summer months, for both the child camper and the older child/adult camper. Thus, this exposure frequency meets the minimum criteria specified in EPA (2003b).

Continuous exposures were determined such that they accounted for contributions from both impacted soil while on-site and unimpacted (background) media while off-site as described below.

#### 3.3.1 IEUBK Model

For the IEUBK model, the average site soil lead concentration was adjusted by simulating a continuous exposure as follows:

$$C_{TWA} = [C_{site} \cdot EF_{site} + C_{bkg} \cdot (365 - EF_{site})] / 365$$

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<sup>2</sup> CTE exposure estimates are intended to represent mean or median exposures for the population of interest (i.e., near the central portion of the range).



where:

$C_{TWA}$  = Time-weighted average soil lead concentration (milligrams of lead per kilogram of soil [mg/kg])

$C_{site}$  = Average soil lead concentration across the dispersed campsites (mg/kg)

$EF_{site}$  = Exposure frequency at dispersed campsites (days/year)

$C_{bkg}$  = Background soil lead concentration in uncontaminated medium (mg/kg)

### 3.3.2 ALM

The same general approach followed for the IEUBK model is followed for the ALM, excluding the contribution from background. This is because the PbB0 term used in the ALM is intended to represent background exposure to lead. Thus, the average site soil lead concentration was adjusted as follows:

$$C_{adj} = C_{site} \cdot (EF_{site}/365)$$

where:

$C_{adj}$  = Adjusted average soil lead concentration (µg/g)

$C_{site}$  = Average soil lead concentration across the dispersed campsites (µg/g)

$EF_{site}$  = Exposure frequency at dispersed campsites (days/year)

## 3.4 IEUBK Model Inputs

**Table B-1** presents the IEUBK input parameters used in this assessment. All model runs were performed using IEUBK Version 1.1, Build 11. All input parameters are set equal to EPA IEUBK defaults (EPA 1994), except as described below.

### *Soil Exposure Point Concentration*

See Section 3.6 for a description of the exposure point concentration (EPC) for soil used in the IEUBK model.

### *Relative Bioavailability*

The default value of relative bioavailability (RBA) for lead in soil and dust assumed by the IEUBK model is 0.60 (EPA 2007). Studies of lead RBA at a variety of mine sites suggests this is a typical value, but values at some sites may be higher or lower (EPA 2007). EPA measured the bioavailability of lead in several roadway and waste rock samples collected within the mining districts. The average site-specific RBA was 0.22, but RBA values were variable, ranging from 0 to 0.51, depending upon the sampling location (TechLaw, Inc. 2017). However, there are no measured RBA data for soils collected from camping areas within the mining districts. Therefore, the EPA default lead RBA value of 0.60 was assumed for this interim lead risk evaluation. This assumption is likely to be conservative as site-specific RBA measurements suggest that lead is in a form that is less readily absorbed. Based on a default absolute absorption fraction of 0.50 for lead

in water and diet, this RBA corresponds to an absolute bioavailability of 0.30 (30%) to be used for soil and dust in the IEUBK model.

#### *Target Blood Lead Level Threshold*

As discussed previously in Section 2, this interim lead risk evaluation will employ a PbB threshold of 5 µg/dL. The goal is there should be no more than a 5% chance that a child will have a blood lead value above 5 µg/dL, which is referred to as P5.

#### *Maternal Blood Lead*

As recommended by EPA (2017a), the IEUBK default maternal blood lead concentration 1.0 µg/dL was changed to 0.8 µg/dL.

#### *Intake Rates*

The residential water intake rates, inhalation rates, dietary intake rates, and soil/dust intake rates were adjusted to be consistent with the values identified in the EPA Technical Review Workgroup (TRW) Lead Consultation for the Colorado Smelter Superfund Site (EPA 2017b). Because soil contact and intake during camping is higher than during typical residential exposures, camping-specific average soil intake rates were obtained from the *Exposure Factors Handbook* (EPA 2017c; Table 5-20). For the purposes of estimating exposures, a time-weighted soil intake rate, which included both the residential and camping-specific values, was calculated as follows:

$$IR_{TWA} = [IR_{camp} \cdot EF_{site} + IR_{res} \cdot (365 - EF_{site})]/365$$

where:

$IR_{TWA}$  = Time-weighted soil/dust intake rate

$IR_{camp}$  = Camping-specific soil/dust intake rate<sup>3</sup>

$EF_{site}$  = Exposure frequency at dispersed campsites (days/year)

$IR_{bkgres}$  = Residential-specific soil/dust intake rate

#### *Lead Drinking Water Concentration*

As documented in the EPA TRW Lead Consultation for the Colorado Smelter Superfund Site (EPA 2017b), the default lead drinking water concentration was adjusted from 4 to 0.9 µg/L, based on the TRW re-analysis of the national drinking water system data reported to EPA.

#### *Age Range*

As recommended in EPA's *Recommendations for Default Age Range in the IEUBK Model* (EPA 2017d), the IEUBK default setting was adjusted to use an age range of 12 to 72 months rather than 0 to 84 months.

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<sup>3</sup> Based on the average intake rate (as calculated from the geometric mean and standard deviation) across boys and girls. See also Table B-1 footnotes.

### 3.5 ALM Inputs

Lead risks for adult receptors (women of child-bearing age) were calculated using the ALM. **Table B-2** summarizes the ALM-specific input values used in this evaluation. Except for the absorption fraction, all values are EPA-recommended defaults. The EPA TRW recommendations for ALM (EPA 2003a) identify a default absorption fraction (AF) for soluble lead in soil of 0.20 but do not specify AF values for other media. As described above for the IEUBK model, the lead RBA for soil was assumed to be equal to the EPA default of 0.60. Based on this RBA, the AF for soil is:

$$AF(\text{soil}) = AF(\text{soluble lead}) \cdot RBA = 0.20 \cdot 0.60 = 0.12$$

See Section 3.6 for a description of the EPC for soil used in the ALM.

### 3.6 Concentration of Lead in Site Media

Camping area soil samples were collected using either a 30- or 5-point composite, depending on size of the area, from a depth of 0 to 2 inches with plastic scoops after breaking up the soil with a shovel. Samples were collected from 13 “dispersed” campsites<sup>4</sup> in designated backcountry areas located throughout the mining districts. **Table B-3** presents a summary of the lead soil concentrations for each dispersed campsite.

In accordance with EPA guidance (EPA 2000), when evaluating exposures from lead in soil, the soil size fraction of interest is the fine (250 micrometers [μm] or less) size fraction. However, most soil samples were not sieved prior to analysis; thus, sample results represent the bulk size fraction (2 millimeters [mm] or less). There were only three soil samples from camping areas that were sieved. These three samples indicate lead concentrations in the fine size fraction may be about 1.17 times higher than the bulk size fraction. Therefore, lead concentrations for the fine fraction were estimated based on measured bulk fraction concentrations using a camping area-specific fines enrichment factor of 1.17 as follows:

$$C_{\text{soil}, 250 \mu\text{m}} = 1.17 \cdot C_{\text{soil}, 2 \text{ mm}}$$

where:

$C_{\text{soil}, 250 \mu\text{m}}$  = Estimated lead concentration in soil for the fine (250 μm) fraction (mg/kg)

$C_{\text{soil}, 2 \text{ mm}}$  = Measured lead concentration in soil for the bulk (2 mm) fraction (mg/kg)

For the purposes of this lead evaluation, two exposure area scenarios were evaluated. The first scenario evaluated exposures based on the average concentration across all the dispersed campsites, which assumes a camper would frequent multiple dispersed campsites within the mining districts over the camping exposure time. Inspection of **Table B-3** shows there is considerable variability in soil lead concentrations across the 13 campsites, with fine fraction concentrations ranging from 86 to more than 51,000 mg/kg. Thus, the second scenario evaluated

<sup>4</sup> A “dispersed” campsite is an area that is suitable for camping or where camping is known to occur but may not be a formal campground. Soil from the USFS South Mineral Campground (CMP14) was not included in this evaluation because it will be evaluated as a different type of camping exposure area in the Bonita Peak Mining District HHRA.

exposures on a campsite-by-campsite basis, which assumes a camper spends all their camping exposure time at a single campsite location.

The basic time-weighted equations presented in Section 3.3 apply regardless of the scenario. For illustration, the time-weighted soil concentration (for the fine size fraction) used in the IEUBK model based on the mean concentration across all dispersed campsites is presented in **Table B-1** and was calculated as follows:

$$C_{TWA} = [6,399 \text{ mg/kg} \cdot 14 \text{ days/year} + 100 \text{ mg/kg} \cdot 351 \text{ days/year}] / 365 \text{ days/year} = 342 \text{ mg/kg}$$

Likewise, the adjusted soil concentration used in the ALM based on the mean concentration across all dispersed campsites is presented in **Table B-2** and was calculated as:

$$C_{adj} = [6,399 \text{ mg/kg} \cdot 14 \text{ days/year}] / 365 \text{ days/year} = 245 \text{ mg/kg}$$

Upland reference areas, located upgradient of the contamination sources in the mining districts, were sampled using composite sampling (as 15-point composites). Only natural, undeveloped areas not likely to be impacted by roads and other anthropogenic features that could be sources of contamination were selected. A range of different upland vegetation communities, consisting of sub-alpine forests and meadows and alpine meadows, were sampled. In total, 17 samples were collected from four unique upland areas (two areas within the Upper Animas River watershed<sup>5</sup> and two areas within the Mineral Creek watershed<sup>6</sup>) (TechLaw, Inc. 2018). The background soil concentration of lead used in this evaluation was 100 mg/kg, which is approximately the 95% upper confidence limit on the mean concentration across all the upland reference soil samples.

As noted previously, the focus of this interim lead risk evaluation is on exposures from soil. The contribution of lead exposures from other media (e.g., diet, sediment, surface water) at the dispersed campsites is likely to be much lower than from soil. Risks from all exposure media will be evaluated as part of the Bonita Peak Mining District HHRA.

## 4.0 Results

### 4.1 Risk Estimates

Potential risks from lead exposures for campers in the dispersed camping areas in the mining districts are shown in **Table B-4** (Panel A) (for young children) and **Table B-5** (for fetuses of pregnant women).

There is a 20% probability that PbB levels in young children will exceed 5 µg/dL (see **Table B-4**, Panel A) based on the average across all dispersed campsites, which is above the selected health-based goal ( $P5 \leq 5\%$ ). The campsite-specific evaluation shows there are four campsites where P5 is greater than 5%, including Campgrounds 2, 3, 4, and 7.

There is only 3% probability that PbB levels in fetuses will exceed 5 µg/dL (see **Table B-5**) based on the average across all dispersed campsites, which is below the health-based goal. However, the

<sup>5</sup> Collected near Clipper Mine and near Frisco/Bagley Tunnel

<sup>6</sup> Collected near Koehler Tunnel and near Bandora Mine

campsite-specific evaluation shows two campsites, Campgrounds 4 and 7, as having P5 greater than 5%.

## 4.2 Derivation of Interim Risk-Based Level

The primary risk driver for lead exposures is the child camper exposure scenario (as evidenced by the fact the predicted P5 values are higher based on IEUBK than ALM). Thus, an interim risk-based human health preliminary remediation goal (PRG) was calculated to ensure that post-remedial exposure conditions would result in a  $P5 \leq 5\%$  as determined based on IEUBK.

Recall the EPC used in the IEUBK model is a time-weighted soil lead concentration ( $C_{TWA}$ ) that accounts for both site and background exposure. Using the IEUBK input parameters specified in Section 3.4, the  $C_{TWA}$  PRG must be 176 mg/kg or lower to achieve the target PbB of 5 µg/dL. The corresponding  $C_{site}$  concentration is calculated by re-arranging the equation shown in Section 3.3.1 to solve for  $C_{site}$  while setting  $C_{TWA}$  equal to 176 mg/kg and  $C_{bkg}$  equal to 100 mg/kg:

$$C_{site} = [(C_{TWA} * 365) - (C_{bkg} * (365 - EF_{site}))] / EF_{site}$$

where:

$C_{site}$  = Average lead PRG across the dispersed campsites (mg/kg)

$C_{TWA}$  = Time-weighted average soil lead PRG (176 mg/kg)

$C_{bkg}$  = Background soil lead concentration (100 mg/kg)

$EF_{site}$  = Exposure frequency at dispersed campsites (14 days/year)

Based on this calculation, to achieve the target PbB of 5 µg/dL,  $C_{site}$  must be 2,081 mg/kg or lower. As illustrated in Panel B of **Table B-4**, if  $C_{site}$  is 2,081 mg/kg, the time-weighted EPC ( $C_{TWA}$ ) is 176 mg/kg and the resulting P5 is 5%. Therefore, the interim human health risk-based level for lead in soil at the dispersed campsites is 2,081 mg/kg. This risk-based level is based on the fine fraction (250 µm); the corresponding soil lead risk-based level based on the bulk fraction (2 mm) is 1,779 mg/kg. Inspection of **Table B-1** shows Campgrounds 2, 3, 4, and 7 have soil lead concentrations above this interim risk-based level.

However, this risk-based level is based on an assumed default lead RBA of 0.6. As discussed above, even though there are no data on site-specific RBA levels in the camping areas, EPA has measured the bioavailability of lead in several roadway and waste rock samples. The average site-specific RBA was 0.22, which suggests that lead in the mining districts is in a form that is less readily absorbed. As illustrated in Panel B of **Table B-4**, if the actual RBA in the camping areas is closer to 0.2, the risk-based level would be 11,598 mg/kg based on the fine fraction (250 µm). Inspection of **Table B-1** shows only Campgrounds 4 and 7 have soil lead concentrations above the risk-based level based on an RBA of 0.2.

Note these risk-based levels apply to the average soil lead concentration across an entire campsite exposure area; it is not to be applied to individual samples within the campsite as a not-to-exceed value.



## 5.0 Conclusion

Potential risks from lead exposures for campers in the dispersed camping areas in the mining districts are above the selected health-based goal ( $P5 \leq 5\%$ ). Unacceptable lead exposures are primarily attributable to elevated soil lead concentrations at four dispersed campsites — Campgrounds 2, 3, 4, and 7.

For Campgrounds 2 and 3, the need for remedial action depends upon the site-specific RBA of lead in soil. If the lead RBA is near the default (0.6), remedial action would be needed; if the lead RBA is closer to the levels measured in roadway/waste rock samples (0.2), remedial action would not be needed. On this basis, it is recommended that any decisions regarding actions at these two campsites be delayed until site-specific measurements of RBA at the campsites can be completed.

For Campgrounds 4 and 7, the soil lead levels exceed the health-based goals for both children and fetuses. In addition, P5 is expected to be greater than 5% at these two campsites, even if RBA were assumed to be similar to levels measured in roadway/waste rock samples (0.2). On this basis, it is recommended these two campsites be included for interim actions in 2018.

The interim risk-based levels for lead presented in this appendix is to be considered preliminary for consideration in risk management decision-making in support of interim remedial actions within the mining districts in 2018. The need for additional remediation will be determined after the completion of the Bonita Peak Mining District HHRA.

## 6.0 References

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**TABLE B-1**  
**IEUBK INPUT PARAMETERS**  
*Focused Feasibility Study, Bonita Peak Mining District*

**Panel A. Age-Independent Values**

Parameter		Value	Basis
Soil concentration (mg/kg)	site	6,399	Mean across all dispersed campsites (see Table B-1)
	background	100	Assumed based on site-specific upland reference <sup>a</sup>
	time-weighted	342	Time-weight adjusted <sup>b</sup>
Drinking water concentration (µg/L)		0.9	EPA (2017d)
Indoor dust concentration		249.4	Cdust = (0.7 x Csoil) + (100 x Cair,out) (IEUBK default; EPA 1994)
Outdoor air concentration (µg/m <sup>3</sup> )		0.1	IEUBK default (OSWER 9285.7-22; EPA 1994)
Indoor air concentration (µg/m <sup>3</sup> )		30% of outdoor	IEUBK default (OSWER 9285.7-22; EPA 1994)
Exposure frequency [EF] (days/year)		14	USFS (2017); one-half maximum allowable time
Absorption fraction [AF] (water)		0.50	IEUBK default (OSWER 9285.7-22; EPA 1994)
Absorption fraction [AF] (diet)		0.50	IEUBK default (OSWER 9285.7-22; EPA 1994)
Relative bioavailability [RBA] (soil)		0.60	EPA default (OSWER 9285.7-80; EPA 2007)
Absorption fraction [AF] (soil,dust)		0.30	AF(soil) = AF(water) x RBA(soil)
Absorption fraction [AF] (air)		0.32	IEUBK default (OSWER 9285.7-22; EPA 1994)
Fraction of soil + dust that is soil		0.45	IEUBK default (OSWER 9285.7-22; EPA 1994)
Geometric standard deviation [GSD]		1.6	IEUBK default (OSWER 9285.7-22; EPA 1994)
Maternal PbB concentration (µg/dL)		0.8	EPA default (OLEM 9285.6-56; EPA 2017a)
Target PbB concentration (µg/dL)		5.0	CDC (2012); professional judgment

**Panel B. Age-Dependent Values**

Age	Air <sup>c</sup>		Diet <sup>c</sup>	Water <sup>c</sup>	Soil and Dust		
	Time Outdoors (hours)	Ventilation Rate (m <sup>3</sup> /day)	Dietary Intake (µg lead/day)	Water Intake (L/day)	Residential Intake Rate (g/day) <sup>c</sup>	Campground Intake Rate <sup>d</sup> (g/day)	Time-weighted Intake Rate <sup>e</sup> (g/day)
0-12 mo (0-1 yrs)	1.0	3.22	2.66	0.40	0.086	0.38 <sup>f</sup>	0.097
12-24 mos (1-2 yrs)	2.0	4.97	5.03	0.43	0.094	0.38	0.105
24-36 mos (2-3 yrs)	3.0	6.09	5.21	0.51	0.067	0.43	0.081
36-48 mos (3-4 yrs)	4.0	6.95	5.58	0.54	0.063	0.16	0.067
48-60 mos (4-5 yrs)	4.0	7.68	5.64	0.57	0.067	0.16	0.071
60-72 mos (5-6 yrs)	4.0	8.32	6.04	0.6	0.052	0.20 <sup>g</sup>	0.058
72-84 mo (6-7 yrs)	4.0	8.89	5.95	0.63	0.055	0.20 <sup>g</sup>	0.061

- Notes:**
- [a] Based on 95% upper confidence limit on the mean concentration for the site-specific upland reference dataset.
- [b]  $C(\text{adjusted}) = C(\text{site}) \cdot (EF/365) + C(\text{background}) \cdot ((365-EF)/365)$
- [c] Values are based on Colorado Smelter Lead Consultation letter (EPA 2017b)
- [d] Values are based on campground-specific soil intake rates from *Exposure Factors Handbook* (EPA 2017c), Table 5-20 (averaged across girls and boys). Arithmetic mean calculated from geometric mean (GM) and geometric standard deviation (GSD) as:  $GM \cdot \exp(0.5 \cdot \ln(GSD)^2)$ .
- [e]  $IR(\text{adjusted}) = IR(\text{campground}) \cdot (EF/365) + IR(\text{residential}) \cdot ((365-EF)/365)$
- [f] No values for 0-1 years provided; assumed to be equal to 1-2 years intake rate.
- [g] No values for >5 years provided; assumed to be equal to intake rate across all age groups.

µg lead/day = micrograms of lead per day

µg/dL = micrograms of lead per deciliter of blood

µg/L = micrograms per liter of water

µg/m<sup>3</sup> = micrograms per cubic meter of air

CDC = Centers for Disease Control

Cdust = dust concentration

Csoil = soil concentration

EPA = U.S. Environmental Protection Agency

g/day = grams of soil per day

IEUBK = Integrated Exposure Uptake Biokinetic

L/day = liters of water per day

m<sup>3</sup>/day = cubic meters of air per day

mg/kg = milligrams of lead per kilogram of soil (or dust)

OSWER = Office of Solid Waste and Emergency Response

PbB = blood lead

USFS = U.S. Forest Service

**TABLE B-2**  
**ADULT LEAD MODEL INPUT PARAMETERS**  
*Focused Feasibility Study, Bonita Peak Mining District*

Parameter	Units	Value	Source	Notes
Baseline geomean PbB [PbB0]	µg/dL	0.6	NHANES 2009-2014	
Biokinetic slope factor [BKSF]	µg/dL per µg/day	0.4	EPA (2003a)	EPA ALM default
Ratio	--	0.9	EPA (2003a)	EPA ALM default
Target PbB (fetus)	µg/dL	5.0	CDC (2012)	Professional judgement
Target PbB (mother)	µg/dL	5.6	Calculated	Target PbB (fetus) / Ratio
Geometric std. deviation [GSD]	--	1.8	NHANES 2009-2014	
Exposure Frequency [EF]	days/year	14	USFS (2017)	One-half maximum allowable time
Soil Concentration:				
site	µg/g	6,399	Site-specific (see Table B-1)	Mean across all dispersed campsites
adjusted	µg/g	245	Exposure frequency adjusted	C <sub>site</sub> * EF / 365 days/year
Soil Ingestion Rate [IR <sub>soil</sub> ]	g/day	0.1	Professional judgment	CTE exposure parameter
Soil relative bioavailability [RBA <sub>soil</sub> ]	--	0.60	EPA (2007)	EPA ALM default
Soil absorption fraction [AF <sub>soil</sub> ]	--	0.12	Calculated; EPA (2003a)	0.2 (default) * 0.6 (RBA <sub>soil</sub> )

**Basic Equations:**

$$\text{PbB}(\text{mother}) = \text{PbB0} + \text{BKSF} * \text{C}_{\text{soil,adj}} * \text{IR}_{\text{soil}} * \text{AF}_{\text{soil}}$$

$$\text{PbB}(\text{fetus}) = \text{PbB}(\text{mother}) * \text{Ratio}$$

µg/d = micrograms of lead per day

µg/dL = micrograms of lead per deciliter of blood

µg/g = micrograms of lead per gram of soil

ALM = Adult Lead Methodology

C = concentration

CDC = Centers for Disease Control

CTE = central tendency exposure

days/year = days per year

EPA = U.S. Environmental Protection Agency

g/day = grams of soil per day

NHANES = National Health and Nutrition Examination Survey

PbB = blood lead

USFS = U.S. Forest Service



**TABLE B-3**  
**SOIL LEAD CONCENTRATIONS IN DISPERSED CAMPSITES**  
*Focused Feasibility Study, Bonita Peak Mining District*

Dispersed Campsite ID	Sample ID	Sample Date	Soil Lead Conc. (mg/kg)	
			2 mm	250 µm
CMP2	MH1E13	7/26/2016	2,880	3,370 [a]
CMP3	A8M5-4732	9/27/2017	7,260	8,494 [a]
CMP4	MH1E14	7/26/2016	44,200	51,714 [a]
CMP5	MH1E15	7/26/2016	200	234 [a]
CMP7	MH1E16	7/26/2016	11,800	13,806 [a]
CMP8	A8M5-4733	9/27/2017	1,320	1,544 [a]
CMP9	MH1E17	7/27/2016	1,330	1,556 [a]
CMP10	MH1E18	7/27/2016	74	86 [a]
CMP11	MH1E19	7/28/2016	431	480 [b]
CMP12	MH1E21	7/27/2016	257	276 [b]
CMP13	MH1E23	7/28/2016	100	117 [a]
CMP15	MH1E26	7/28/2016	530	620 [a]
CMP15A	MH1L12	9/28/2016	761	890 [a]

mean: **6,399**

[a] Estimated based on camping area-specific fines enrichment factor of 1.17:

$$C_{\text{soil, 250-}\mu\text{m}} = 1.17 \cdot C_{\text{soil, 2-mm}}$$

[b] Measured

µm = micrometers

Conc. = concentration

ID = identification

mg/kg = milligrams per kilogram soil

mm = millimeters

**TABLE B-4**  
**EVALUATION OF RISK FROM LEAD USING THE IEUBK MODEL**  
*Focused Feasibility Study, Bonita Peak Mining District*

**Panel A. Exposure at Dispersed Campsites**

Exposure Location	Soil Lead Concentration (mg/kg)			P5 (% Above Target Blood Lead of 5 µg/dL)
	Site	Bkg	Time-weighted EPC <sup>a</sup>	
Dispersed Campsites - all	6,399	100	342	20%
CMP2	3,370	100	225	9%
CMP3	8,494	100	422	29%
CMP4	51,714	100	2,080	97%
CMP5	234	100	105	2%
CMP7	13,806	100	626	52%
CMP8	1,544	100	155	4%
CMP9	1,556	100	156	4%
CMP10	86	100	99	1%
CMP11	480	100	115	2%
CMP12	276	100	107	2%
CMP13	117	100	101	1%
CMP15	620	100	120	2%
CMP15A	890	100	130	3%

 greater than 5%

**Panel B. Derivation of Risk-based Cleanup Level**

Exposure Location (RBA)	Soil Lead Concentration (mg/kg)			P5 (% Above Target Blood Lead of 5 µg/dL)
	Site	Bkg	Time-weighted EPC <sup>a</sup>	
Camping Area (RBA=0.6)	<b>2,081</b>	100	176	5.0%
Camping Area (RBA=0.2)	<b>11,598</b>	100	541	5.0%

↑  
 risk-based level for site

**Notes:**

[a]  $C(\text{adjusted}) = C(\text{site}) \cdot (EF/365) + C(\text{bkg}) \cdot ((365-EF)/365)$

% = percent

µg/dL = micrograms per deciliter

C(bkg) = soil lead concentration for background

C(site) = soil lead concentration for the site

EF = exposure frequency (days per year)

EPC = exposure point concentration

IEUBK = Integrated Exposure Uptake Biokinetic

mg/kg = milligrams lead per kilogram soil

RBA = relative bioavailability

**TABLE B-5**  
**ADULT LEAD MODEL OUTPUT**  
*Focused Feasibility Study, Bonita Peak Mining District*

Exposure Location	Csoil, site	Absorbed dose from soil	GM PbB (mother)	mu [ln(GM PbB mother)]	sigma [ln(GSD)]	P5 (fetus)
	µg/g	µg/day	µg/dL			%
Dispersed Campsites - all	6,399	2.95	1.8	0.58	0.59	3%
CMP2	3,370	1.55	1.2	0.20	0.59	<0.01%
CMP3	8,494	3.91	2.2	0.77	0.59	5%
CMP4	51,714	23.80	10.1	2.31	0.59	85%
CMP5	234	0.11	0.6	-0.44	0.59	<0.01%
CMP7	13,806	6.35	3.1	1.14	0.59	17%
CMP8	1,544	0.71	0.9	-0.12	0.59	<0.01%
CMP9	1,556	0.72	0.9	-0.12	0.59	<0.01%
CMP10	86	0.04	0.6	-0.48	0.59	<0.01%
CMP11	480	0.22	0.7	-0.37	0.59	<0.01%
CMP12	276	0.13	0.7	-0.43	0.59	<0.01%
CMP13	117	0.05	0.6	-0.48	0.59	<0.01%
CMP15	620	0.29	0.7	-0.34	0.59	<0.01%
CMP15A	890	0.41	0.8	-0.27	0.59	<0.01%

 greater than 5%

% = percent

µg/day = micrograms of lead per day

µg/dL = micrograms of lead per deciliter of blood

µg/g = micrograms of lead per gram of soil

Csoil, site = soil lead concentration for the site

GM = geometric mean

GSD = geometric standard deviation

PbB = blood lead

**APPENDIX B – PART 1.2**  
**HUMAN HEALTH ACUTE ARSENIC SCREENING LEVELS**

## Appendix B – Part 1.2

# Human Health Acute Arsenic Screening Levels

### 1.0 Introduction

This appendix describes an interim evaluation of potential arsenic risks from exposures to arsenic in soil/waste rock at the Bonita Peak Mining District Superfund Site (Site) located in southwestern Colorado. The Site consists of 48 historic mines or mining-related sources where ongoing releases of metal-laden water and sediments are occurring within the Mineral Creek, Cement Creek, and Upper Animas River drainages in San Juan County, Colorado. Drainages within the Site contain over 400 abandoned or inactive mines where large- to small-scale mining operations occurred. San Juan County is comprised of 10 historic mining districts (Colorado Geological Survey 2017). Historic mining districts within the Mineral Creek, Cement Creek, and Upper Animas River drainages (referred to as “the mining districts” in this appendix) include Animas, Animas Forks, Cement Creek, Eureka, Ice Lake Basin, and Mineral Point.

Acute screening levels have been developed for consideration in the identification of areas that may warrant interim remedial actions in 2018. These levels are to be considered preliminary and subject to change pending completion of the Bonita Peak Mining District human health risk assessment (HHRA).

Arsenic was selected for evaluation because soil concentrations are notably elevated at several locations within the mining districts and arsenic is often an important human health risk driver for mining-related contamination. The camping scenario was selected for the derivation of acute screening levels because the camper is anticipated to be the most sedentary of receptors (i.e., not moving about being exposed to a variety of soil/mine waste sources, in contrast with hiker, hunter, fisherman, all-terrain vehicle rider/guide, and road worker receptors). Derivation of screening levels for a sedentary receptor allows for the application of these screening levels to smaller exposure areas, such as individual campgrounds.

In addition, focus was placed on exposures to children because children are often more vulnerable to pollutants than adults due to differences in behavior and biology that can lead to greater exposure and/or unique windows of susceptibility during development. Additionally, soil ingestion rates for young children are higher than adults due to increased frequency of contact through hand-to-mouth or object-to-mouth activity. Thus, exposure parameters used in the derivation of the acute screening levels were tailored for children 1 to 3 years old depending on the exposure scenario. Three exposure scenarios for a child that may camp within the mining districts were evaluated:

- Scenario 1: Child, based on central tendency exposure (CTE) residential soil intake rates identified in the EPA Technical Review Workgroup (TRW) Lead Consultation for the Colorado Smelter Superfund Site (EPA 2017a)
- Scenario 2: Child, based on CTE soil intake rates specific to a camping exposure scenario (EPA 2017b)



- Scenario 3: Child, based on reasonable maximum exposure (RME) soil intake rates specific to a camping exposure scenario (EPA 2017b)

Potential risks to a variety of recreational and occupational receptor populations from all contaminants of interest and all exposure media and pathways will be evaluated as part of the Bonita Peak Mining District HHRA.

## 2.0 Derivation of Acute Screening Levels

As noted above, acute screening levels have been developed for multiple exposure scenarios resulting in a range of acute screening levels for consideration in risk management decision-making. The sections below present the approach and assumptions used in the derivation of the acute screening levels for arsenic for application to soil/waste rock.

Acute screening levels were developed based on exposure durations of 2 days and 14 days. An exposure duration of 2 days represents a camping duration of a weekend, while 14 days represents the maximum allowable time that may be spent camping in one location in the National Forest (U.S. Forest Service [USFS] 2017).

### 2.1 Toxicity Data

Acute toxicity information is generally lacking for arsenic, and acute arsenic screening levels specific to the type of receptors present within the mining districts (i.e., recreational visitors) are not available. A review of *Toxicological Profile for Arsenic* developed by the Agency for Toxic Substances and Disease Registry (ATSDR) reveals oral doses as low as 0.02 to 0.06 milligrams of arsenic per kilogram body weight per day (mg/kg BW/day) have been reported to cause toxic effects in some individuals (ATSDR 1989). Severe exposures can result in acute encephalopathy, congestive heart failure, stupor, convulsions, paralysis, coma, and death. The acute lethal dose to humans has been estimated to be about 0.6 mg/kg BW/day (ATSDR 1989).

Washington State Department of Health (WSDOH) provides a synopsis of published scientific information related to soil exposure and acute toxicity in *Hazards of Short-term Exposure to Arsenic Contaminated Soil* (WSDOH 1999). The most sensitive reported indicators of acute toxicity appear to be edema, conjunctivitis, liver enlargement, irritation of the mucous membranes, and gastrointestinal problems, such as vomiting, diarrhea, cramps, and pain. Transient adverse health effects commonly occur when doses between 0.035 and 0.071 milligrams of arsenic per kilogram of body weight (mg/kg BW) are ingested. The best estimate of an acute threshold for transient effects is 0.05 mg/kg BW.

Using the acute transient effect dose information, acute arsenic screening levels can be derived for each of the three exposure scenarios. The equation used to derive the acute screening levels is as follows:

$$ASL_{As} = (ATE / SF) / (IR / CF_{IR} / BW \cdot ED \cdot RBA)$$

where:

$$ASL_{As} = \text{Acute screening level for arsenic (mg/kg soil)}$$

ATE	=	Acute transient effect (mg/kg BW)
SF	=	Toxicity safety factor (unitless)
IR	=	Soil intake rate (g soil/day)
CF <sub>IR</sub>	=	Conversion factor for intake rate, convert g to kg
BW	=	Body weight (kg BW)
ED	=	Exposure duration (days)
RBA	=	Relative bioavailability

## 2.2 Exposure Data

**Table B-1** presents the general input parameters used to derive the acute screening levels for arsenic, recognizing that several of the assumptions may differ from those typically used in an evaluation of chronic exposures.

**Table B-1. General Parameters Used to Calculate the Acute Arsenic Screening Levels**

Parameter	Value	Source
Receptor gender	Female	EPA 2008 (Table 8-10)
Acute transient effect dose (mg arsenic/kg body weight)	0.05	WSDOH 1999
Toxicity safety factor (unitless)	10	WSDOH 1999
RBA	0.1	TechLaw (2017)

mg— milligrams

kg — kilograms

RBA — relative bioavailability

The rationale for the selection of each input provided in **Table B-1** is presented below:

- Receptor gender – A female receptor was selected because female children have a lower body weight than male children (EPA 2008). A receptor with a lower body weight is more sensitive to exposure compared to a receptor with a higher body weight.
- Acute transient effect dose – The best estimate acute transient effect dose was selected to represent the dose at which edema, conjunctivitis, liver enlargement, irritation of the mucous membranes, and/or gastrointestinal problems (vomiting, diarrhea, cramps, and pain) may occur (WSDOH 1999).
- Toxicity safety factor – A no-effect level is typically estimated by dividing the dose observed to cause health effects by a safety factor. There is little scientific information available to guide the selection of a safety factor for short-term exposure to arsenic in soil. The selection must be based on judgement of the margin of safety desired for protection from the potential adverse consequences of this type of event. For the three scenarios, a safety factor of 10, to derive a no-effect level from an acute effect level, was considered adequate to calculate soil arsenic concentrations protective of human health. This choice was based

on consideration of documented variability in human sensitivity to the toxic effects of arsenic as well as consideration of likelihood of occurrence of the various scenarios (WSDOH 1999).

- RBA – Arsenic RBA was determined by measuring *in vitro* bioaccessability for roadway and waste rock samples collected within the mining districts. The mean estimate of RBA for arsenic was 0.06, with values ranging from 0.03 to 0.11 (TechLaw, Inc. 2017). There was little difference in mean RBA between these two media types (0.08 for roadway samples and 0.05 for waste rock samples). To simplify this evaluation and to be conservative, an RBA of 0.1 was selected for use in the calculations. The implications of this simplifying assumption are discussed further below.

**Table B-2** presents the scenario-specific input parameters used to derive the acute screening level for arsenic.

**Table B-2. Scenario-Specific Parameters Used to Calculate the Acute Arsenic Screening Levels**

Parameter	Scenario 1 CTE Resident	Scenario 2 CTE Camping	Scenario 3 RME Camping	Source
Soil intake rate during exposure (g soil/day)	0.094	0.367	1.592	Scenario 1: EPA 2017a Scenario 2 & 3: EPA 2017b (Table 5-20)
Receptor age at exposure	1 year old	2 years old	2 years old	EPA 2017b (Table 5-20)
Receptor body weight (kg)	11.0	12.5	12.5	EPA 2008 (Table 8-10)

CTE – central tendency exposure

g – grams

kg – kilograms

RME – reasonable maximum exposure

The rationale for the selection of each input provided in **Table B-2** is presented below:

- Soil intake rate during exposure – Multiple soil intake rates were selected for use to present a range of acute screening levels. In each case, the most conservative soil intake rate available for each scenario was selected so that the most sensitive receptor was used in the model.
  - Scenario 1 – The soil intake rate selected for a CTE resident was 0.094 grams per day (g/day). This value was selected because it is the highest mean intake rate provided in the EPA TRW Lead Consultation for the Colorado Smelter Superfund Site (EPA 2017a) for children under the age of 6 years. This value corresponds to a 1-year-old to 2-year-old receptor.
  - Scenario 2 – The soil intake rate selected for a CTE child while camping was 0.367 g/day because this is the highest geometric mean intake rate provided in the *Exposure Factors Handbook* (EPA 2017b, Table 5-20). This value corresponds to a 2-year-old to 3-year-old girl. The study upon which this value is based evaluated soil intake using a tracer element methodology for 78 children aged 1 to 5 years old at campgrounds (Van Wijnen et al. 1990).

- Scenario 3 – The soil intake rate selected for an RME child while camping was 1.592 g/day because this is the 95<sup>th</sup> percentile (computed using the reported geomean and geometric standard deviation) for the intake rates provided for the 2-year-old to 3-year-old girl (EPA 2017, Table 5-20).
- Receptor age at exposure – The age at exposure was a 1 year old for Scenario 1, and 2 years old for Scenarios 2 and 3.
- Receptor body weight – The receptor body weight was selected to correlate to the age and gender of the receptor. The mean female body weights for a 1-year old and 2-year old were selected (EPA 2008, Table 8-10).

## 2.3 Screening Levels

**Table B-3** presents the acute screening levels for arsenic based on a 2-day and 14-day exposure to soil/waste rock that were derived based on the inputs provided in the tables above and for the scenarios that have been described.

**Table B-3. Acute Arsenic Screening Levels (mg/kg)**

Scenario	2-Day Exposure	14-Day Exposure
Scenario 1	2,926	418
Scenario 2	851	122
Scenario 3	196	28

mg/kg – milligrams per kilogram

**Table B-4** presents a comparison of the acute arsenic screening levels with varying RBA values (0.1 versus 0.06) to demonstrate the change in the screening level if a lower RBA value were used. As seen, the change in screening level is inversely proportional to the change in RBA; decreasing the RBA by a factor of 1.7 increases the screening level by 1.7.

**Table B-4. Effect of Using a Different RBA Value on Acute Arsenic Screening Levels (mg/kg)**

Scenario	2-Day Exposure		14-Day Exposure	
	RBA = 0.1	RBA = 0.06	RBA = 0.1	RBA = 0.06
Scenario 1	2,926	4,876	418	697
Scenario 2	851	1,419	122	203
Scenario 3	196	327	28	47

mg/kg – milligrams per kilogram

RBA – relative bioavailability

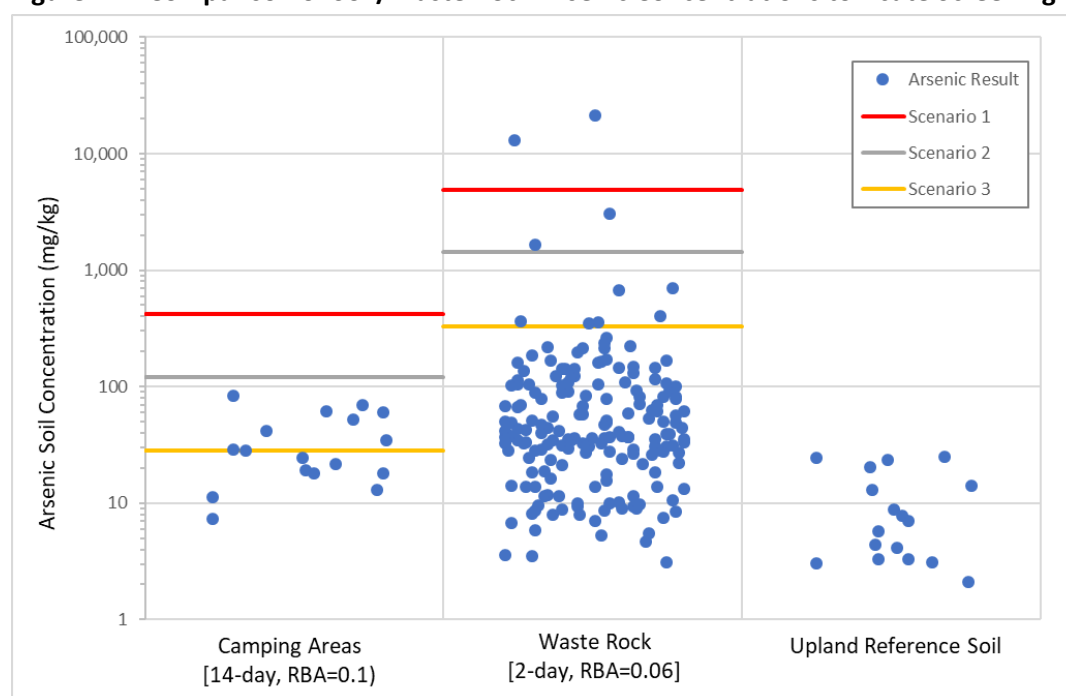
## 3.0 Conclusions

A range of screening levels have been provided based on the understanding there may be differences in the applicable exposure scenario depending upon the type of location being evaluated. When identifying potential locations where interim actions may be needed, the appropriate screening level (i.e., 14-day versus 2-day) will depend upon the type and duration of exposure that may reasonably be anticipated to occur at the location of interest. For example, the 14-day screening level should be used when evaluating established campgrounds and areas where extended camping may occur (e.g., the dispersed campsites), whereas the 2-day screening

level should be used when evaluating other types of potential recreational use areas. When evaluating locations, such as the camping areas, where site-specific RBA data are not available, assuming a higher RBA of 0.1 is most appropriate; however, when evaluating locations where site-specific RBA data are applicable, such as the waste rock areas, use of the average RBA of 0.06 is most appropriate.

**Figure B-1** illustrates a comparison of measured soil/waste rock arsenic concentrations to the acute screening levels for Scenarios 1, 2, and 3. For reference, measured concentrations from upland reference locations are also shown. The site-specific upland reference soil dataset includes 17 samples collected from natural, undeveloped areas within the mining districts not likely to be impacted by roads and other anthropogenic features that could be sources of contamination.

**Figure B-1. Comparison of Soil/Waste Rock Arsenic Concentrations to Acute Screening Levels**



**Screening Levels:**

- Scenario 1 = Residential CTE soil intake rates
- Scenario 2 = Camping-specific CTE soil intake rates
- Scenario 3 = Camping-specific RME soil intake rates

CTE = central tendency exposure  
mg/kg = milligrams per kilogram  
RBA = relative bioavailability  
RME = reasonable maximum exposure

Scenarios 2 and 3 employ camping-specific intake rates, which are likely to be more applicable to the recreational scenarios of interest within the mining districts. Thus, these scenarios were selected in preference to Scenario 1. For the purposes of this evaluation, Scenario 2 (based on CTE intake rates) was selected in preference to Scenario 3 (based on RME intake rates). This is



because this focused evaluation is seeking to address those areas where exposures may be greatest, even for those individuals with “typical” intake rates. In addition, it appears the 14-day screening levels for Scenario 3 may be overly conservative in consideration of local background levels of arsenic. Inspection of the site-specific upland reference soil dataset shows background arsenic soil concentrations ranges from about 2 to 26 mg/kg (mean of 11 mg/kg) (TechLaw, Inc. 2018), whereas the 14-day Scenario 3 screening level is 28 mg/kg. It is not expected that naturally occurring levels of arsenic would approach an acutely toxic threshold based on a short-term exposure scenario. On this basis, it is recommended interim action determinations be based on the Scenario 2 screening levels.

When soil/waste rock arsenic concentrations are compared to Scenario 2 screening levels (see grey line series in **Figure B-1**), there are no camping area samples that are above the 14-day level (122 mg/kg at RBA of 0.1), but there are several samples from waste rock areas above the 2-day level (1,419 mg/kg at RBA of 0.06). Indeed, there are three locations – Koehler Tunnel, Junction Mine, and Longfellow Mine – where arsenic concentrations in waste rock are higher than 1,000 mg/kg.

The acute screening levels for arsenic presented in this appendix are to be considered preliminary for consideration in risk management decision-making in support of interim remedial actions within the mining districts in 2018. The need for additional remediation will be determined after the completion of the Bonita Peak Mining District HHRA.

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**APPENDIX B – PART 2**  
**ECOLOGICAL RISK TECHNICAL MEMORANDUM**

05/11/18

**To:** Rebecca Thomas, Remedial Project Manager, USEPA Region 8

**From:** Andrew Todd, PhD, Aquatic Toxicologist, USEPA Region 8

**Subject:** Ecological Risk Technical Memorandum- Proposed Interim Remedial Actions in the Bonita Peak Mining District

Rebecca,

Per your request, this technical memorandum was drafted to summarize the potential for reduction of ecological risk associated with the Interim Remedial Action proposed to take place within the Bonita Peak Mining District (“Site”) Superfund Site in San Juan County, Colorado. In the following analysis, I have considered these proposed actions through the lens of their role in contributing to ecological risk within the Site. Of note, because the terrestrial ecological risk assessment for the Site is currently in the early stages of development, this memorandum will focus on the potential for reduction of aquatic ecological risk through the proposed Interim Remedial Action.

### **Background**

The Animas River and many of its tributaries have high concentrations of inorganic contamination in the surface water and sediment originating both from legacy mining-related sources as well as from natural sources not directly attributable to mining. Elevated metals concentrations in surface waters and sediments can pose significant risk to potentially resident aquatic organisms through a variety of mechanisms, including through both acute and chronic toxicity.

Past efforts to assess existing risk to aquatic ecosystems within the Animas River watershed are documented in the Draft Baseline Ecological Risk Assessment (“Draft BERA”) for the Upper Animas Mining District (USEPA 2015). The spatial scope of that investigation considered the mainstems of the Animas River, Cement Creek, and Mineral Creek near their respective confluences in the town of Silverton, as well as the Animas River from Silverton downstream to Baker’s Bridge north of Durango.

The Draft BERA evaluated several lines of evidence in quantifying ecological risk to the Animas River, including:

- Comparison of metal concentrations measured in site environmental media (surface water, sediment, pore water) to known toxicity thresholds
- Toxicity testing exposing aquatic organisms within a controlled laboratory environment to site environmental media
- Assessment of aquatic community characteristics in the field [e.g. quantifying fish and benthic macroinvertebrate (BMI) populations and locations]

The Draft BERA reached several conclusions regarding mining-related risk to the aquatic ecosystems in the Animas River watershed. Initially, all lines of evidence indicated that benthic macroinvertebrate communities are currently impaired in most of the reaches of the Animas River that were evaluated. Similarly, the Draft BERA concluded that fish communities in the evaluated reaches of the Animas River, Cement Creek, and Mineral Creek are either non-existent or highly stressed due to high metals concentrations.

For the sake of simplification, in considering how the proposed Interim Remedial Action will affect aquatic ecological risk within the Animas River and tributaries, this memorandum will focus primarily on fish. As noted above, BMI communities in most reaches of the Animas are currently at risk as well. However, because many of the factors limiting these BMI communities are similar to those limiting fish communities (e.g. acute and chronic toxicity of metals), it is expected that the instream BMI communities would respond in a similar fashion as fish to reductions in metal loading.

### **Known Fisheries in the upper Animas River and Tributaries**

Routine fish sampling has been conducted by Colorado Parks and Wildlife (“CPW”) within the Animas River below its confluence with Mineral Creek and downstream to the city of Durango. In the reach immediately below Silverton, CPW has three sampling locations (A-72, Elk Park, and Teft Spur), collectively referred to as Animas River #3. CPW has an additional long-term fishery sampling site on the Animas River at Howardsville (Animas River #4). **Figure 1** illustrates inter-annual trends of the brook trout fishery in the Animas River at Howardsville and the three sites immediately below Silverton.

At CPW’s Howardsville site, densities of brook trout at this location have fluctuated over the years, but have remained relatively stable over the past two decades (1998, 2005, 2010, 2014, and 2015 sampling events) (**Figure 1**). The water quality at this site reflects metal loading from upper Animas sources, including proposed Interim Remedial Action locations in the Burrows Gulch, Animas Forks, and Eureka areas.

CPW’s A-72 site is the closest to Silverton, and has been documented to be essentially devoid of fish (5 brook trout per mile were found in 2005) (**Figure 1**). The water quality at this site (and all sites within CPW’s Animas River #3 section) reflects metal loading from the Animas River, Cement Creek, and Mineral Creek drainages, including all of the proposed Interim Remedial Action locations.

CPW’s Elk Park Site is located approximately 5 miles downstream of A-72, and just upstream of Elk Creek. As opposed to A-72, this site sustained a brook trout fishery of between 70 – 90 fish per mile through sampling in 2005. After that point, brook trout populations have been significantly reduced (although 2 brook trout were captured in 2015) (**Figure 1**).

At CPW’s Teft Spur site, fisheries surveys have revealed significant reductions in the density of the relatively metals-tolerant brook trout, as well as the elimination of populations of metals-sensitive salmonid species such as the cutthroat, rainbow and brown trout. For example, while brook trout densities at the Teft Spur site remained between 300 – 350 fish per mile in three



surveys before 2006 (1992, 1998, and 2005), more recent surveys have documented brook trout densities near 100 fish per mile in the last three surveys (2010, 2014, 2015) (**Figure 1**). These dramatic fisheries impacts coincided with a period of increasing metals concentrations within this reach of the Animas River (i.e. between 2005 and 2010) (CPW 2010), in part attributable to the termination of operation of a key water treatment plant in the Cement Creek drainage in mid-2004.

Finally, fish have recently been documented in several other reaches of the Animas River and tributaries as a part of qualitative habitat surveys conducted by the USGS in 2016 as seen in **Figure 2**. These locations include trout populations in Cunningham Creek near its mouth, in the South Fork of Mineral Creek near its mouth, in Mineral Creek between Mill Creek and the Middle Fork of Mineral Creek, and in Mineral Creek below the South Fork of Mineral Creek.

### **Potential Risk Reduction Benefits from Proposed Interim Remedial Action**

Each of the proposed Interim Remedial Action has as a potential benefit to the reduction of metals concentrations in surface waters downgradient of them by addressing potential mining related sources and/or the reduction of stormwater or mining-related discharges comingling with these sources. Importantly, many of the metals originating from the Interim Remedial Action mining-related sources are known to be toxic to aquatic life at elevated levels. **Table 1** presents hazard quotients (HQs) for samples collected from adit drainages and surface water found immediately downstream of proposed Interim Remedial Action mining-related sources until the next potential influence on the surface water body was encountered (e.g., another creek or mining-related source) in the Animas River, Cement Creek and Mineral Creek drainages. HQs were computed by comparing surface water concentrations with Colorado's hardness-based chronic aquatic life water quality criteria (concentration / criteria) for aluminum, cadmium, copper, and zinc for samples collected in 2015 to present. HQs greater than one indicate there is a potential unacceptable risk to aquatic life under CERCLA. **Figure 3** to **Figure 5** present the maximum individual HQs across the four metals for each sampling location to provide an overall impression of the magnitude of HQ at Interim Remedial Action locations. As seen, there are few locations where maximum individual metal HQ values are less than one, with many locations in both adit drainages and downstream surface waters demonstrating HQs greater than 100.

While aquatic life is unlikely to be directly exposed to mine-related surface water drainages (i.e., mine portal discharges), where they enter the receiving stream, they can significantly increase instream metals concentrations. Many toxic metals are conservatively transported in surface waters, and can remain in solution well downstream of where they were loaded. As such, actions that reduce toxic metal loading to surface waters containing aquatic ecosystems (or to surface waters that are tributary to waters containing aquatic ecosystems) are likely to reduce the metal-related ecological risk to resident or potentially-resident aquatic communities in the immediate receiving waters as well as hydrologically-connected downstream reaches.

### *Cement Creek*

While Cement Creek has long been characterized as being unable to support aquatic life, the Animas River below Cement Creek contains fisheries that are sensitive to changes in instream metals concentration (**Figure 1**). Just as worsening of instream water quality between 2005 and 2010 surveys resulted in the reduction of brook trout density and overall fish species diversity at CPW's Teft Spur site, it is reasonable to predict that a sustained reduction of metal loading to this stream reach from Cement Creek is likely to reduce risk to resident or potentially-resident aquatic life. Further, improvements resulting from the reduction of dissolved metal-related risk would be expected in reaches of the Animas downstream of Teft Spur as well (e.g. Animas River in Durango).

### *Mineral Creek*

Reduction of metal loading would be expected to reduce risk to the trout population that has been documented in the South Fork of Mineral Creek to its mouth. An Interim Remedial Action may improve conditions in the mainstem of Mineral Creek and beyond into the Animas River as described above.

### *Upper Animas River*

Sustained reduction of metal loading through Interim Remedial Action (excluding the proposed action at the Pride of the West Mine) would be expected to reduce risk to the trout population present in the Animas River between Maggie Gulch and Cunningham Creek (**Figure 1**). The proposed Interim Remedial Action at the Pride of the West Mine would be expected to reduce risk to the trout population that has been documented in Cunningham Creek below the influence of the mine. All of these actions would be expected to improve water quality in the Animas River below Howardsville, including reaches of the Animas below Silverton described above.

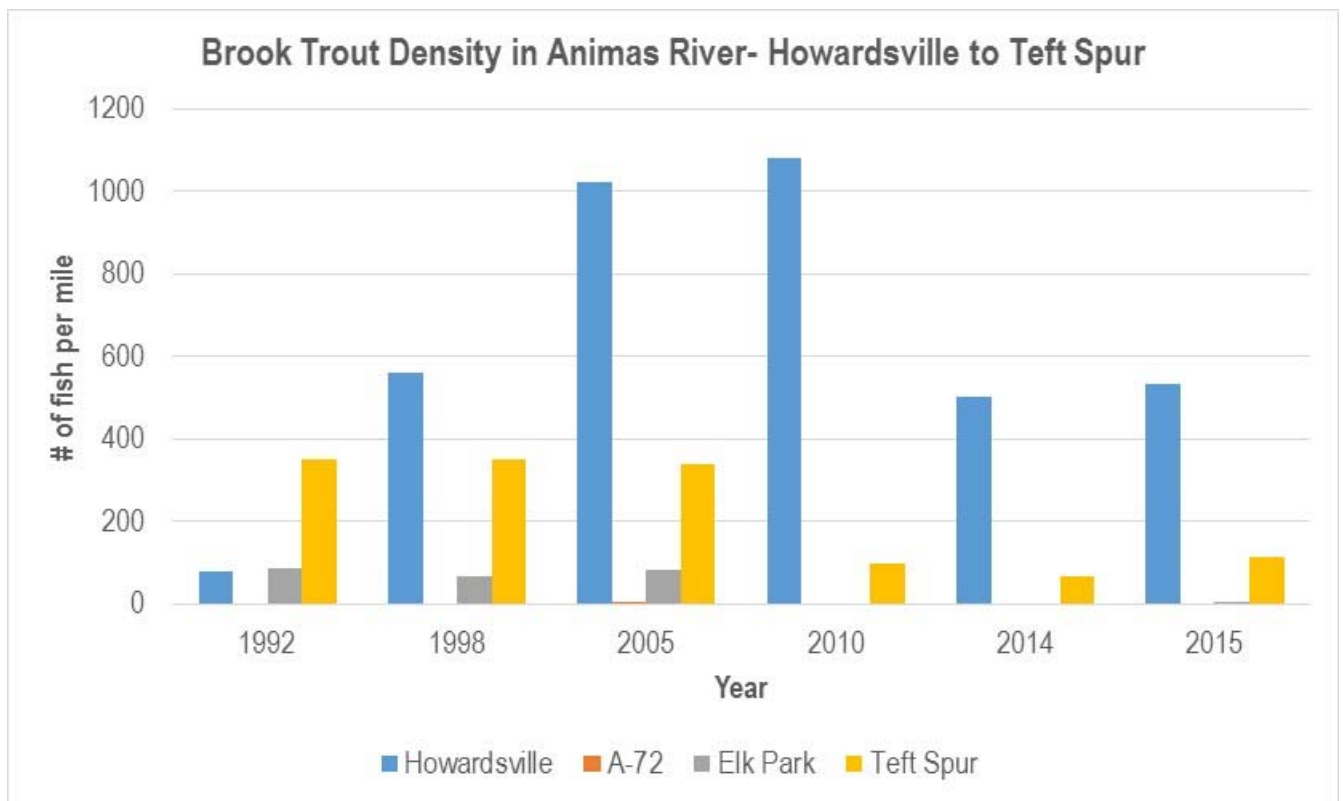
## **Conclusions**

The health of aquatic ecosystems within the Animas River and its tributaries are currently limited by high concentrations of toxic metals emanating from a wide range of mining-related and natural sources distributed throughout the greater Animas River watershed. In many locations, metals concentrations are currently so elevated that aquatic life is precluded. In other locations, metals-tolerant organisms (e.g. brook trout) are currently able to persist. Actions that result in sustained metal loading reduction function to reduce toxic metals exposure to resident organisms (or potentially resident) within these streams. If enough of these actions are taken, improved survival, abundance and diversity of aquatic life can reasonably be expected where aquatic ecosystems are currently marginal. Further, expansion of the spatial extent of aquatic communities may also be possible as instream water quality improves.

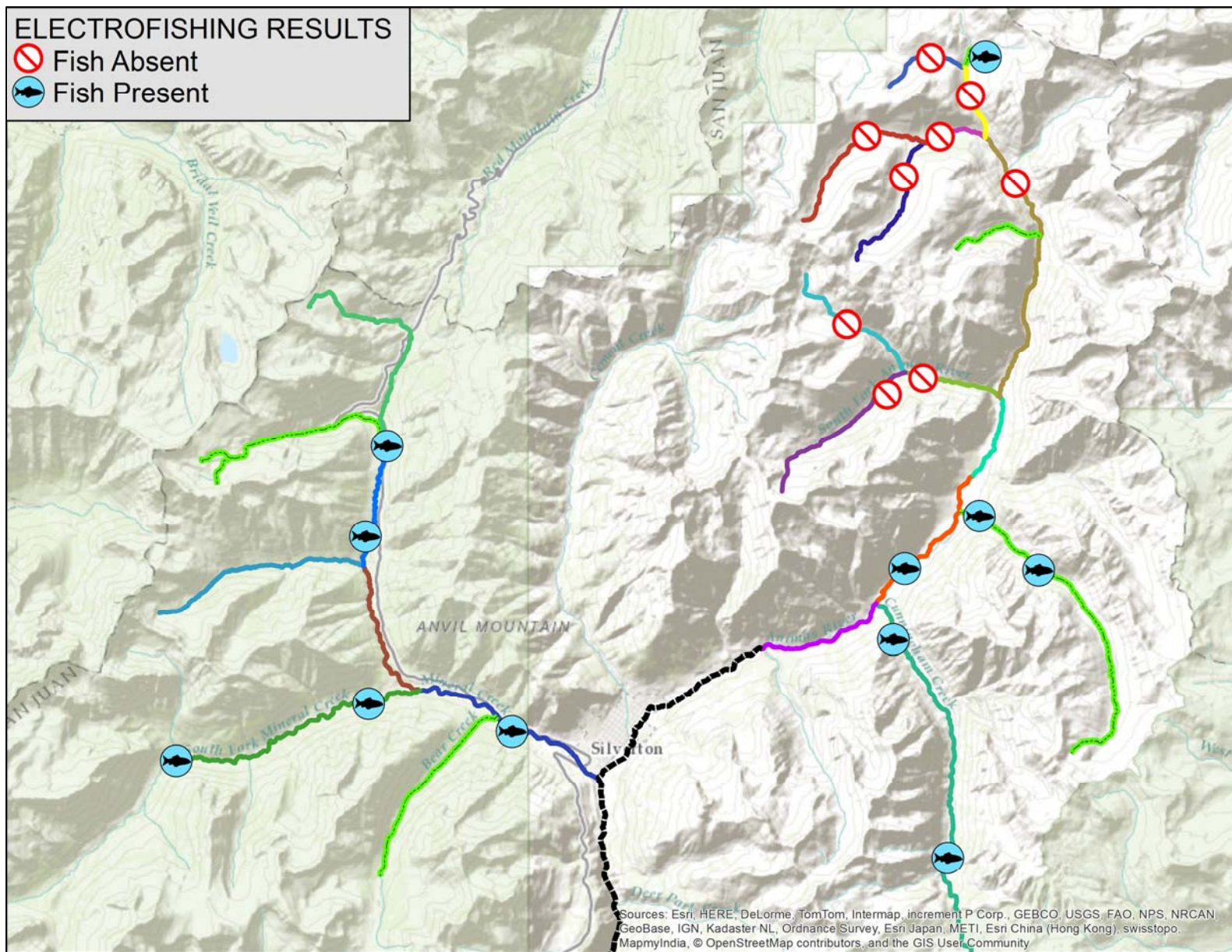
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USEPA. 2015. Final Draft Baseline Ecological Risk Assessment Upper Animas Mining District, San Juan County, Colorado. Prepared by: TechLaw, Inc. ESAT Region 8. Prepared for: U.S. Environmental Protection Agency, Region 8. April.

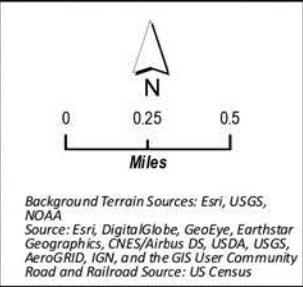
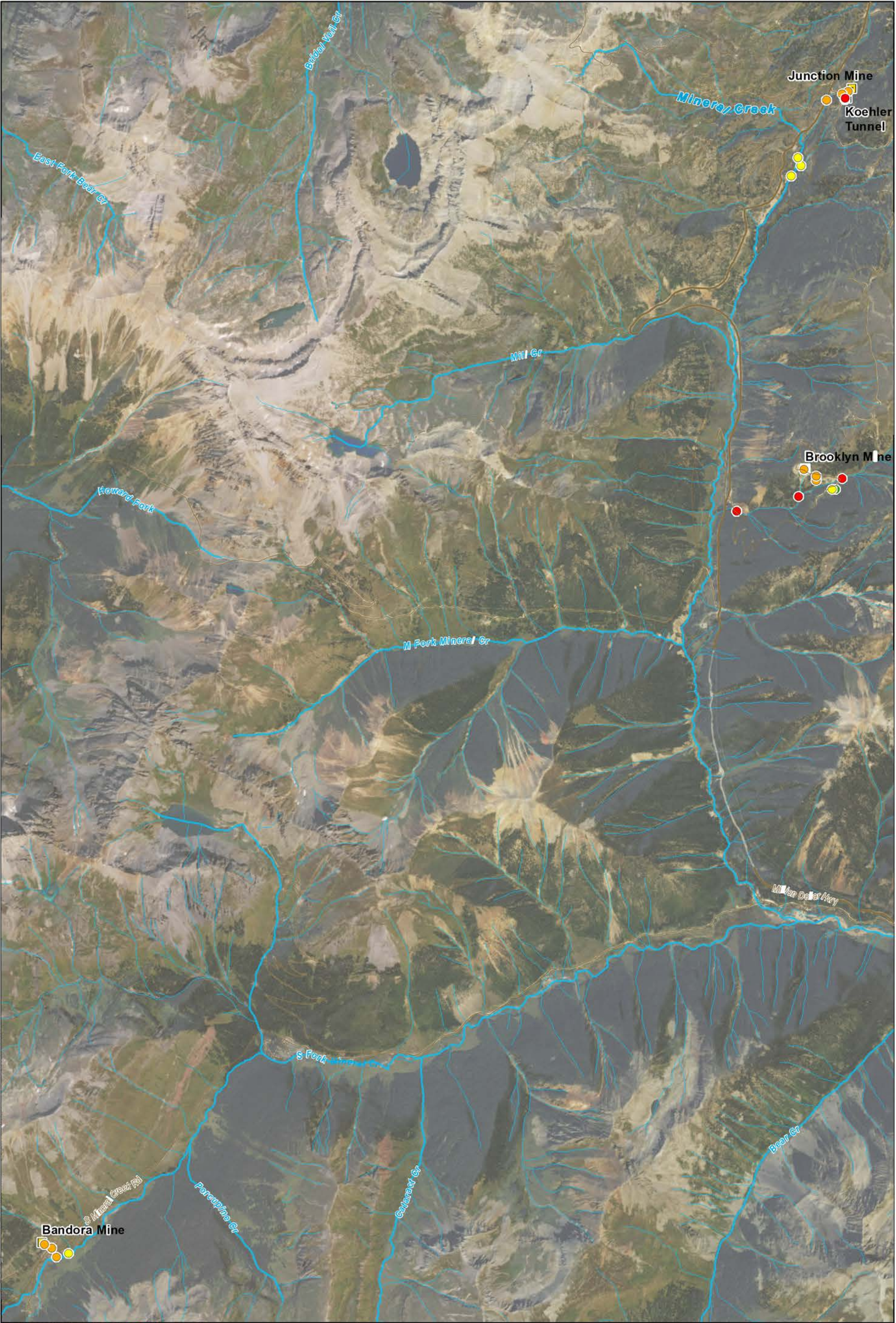


**Figure 1.** Fish densities in the Animas River at four sites. The Howardsville Site (CPW Animas Site #4) is located just above Cunningham Creek on the Animas. The remaining sites (A-72, Elk Park, Teft Spur) are in progressive order on the Animas River below Silverton. Data were collected and reported by Colorado Parks and Wildlife (CPW 2010; CPW 2014; CPW 2015).



**Figure 2. U.S. Geological Survey Electrofishing Results (2016)**  
**Bonita Peak Mining District**  
**San Juan County, CO**





**Legend**

- Proposed Interim Remedial Action Location
- Road
- Hazard Quotient (HQ)**
- HQ ≤ 1
- HQ > 1 and ≤ 25
- HQ > 25 and ≤ 100
- HQ > 100

**Figure 3**

Maximum Hazard Quotients in Mine Discharges and Surface Water for Aluminum, Cadmium, Copper, and Zinc at Locations Downstream of Proposed Interim Remedial Action Locations - Mineral Creek

Bonita Peak Mining District | San Juan County, CO











TABLE 1

Hazard Quotients in Mine Discharges and Surface Water for Aluminum, Cadmium, Copper, and Zinc at Locations Downstream  
of Proposed Interim Remedial Action Locations  
Bonita Peak Mining District

Drainage	Sub-Drainage	Location	Sample Date	Hazard Quotient (HQ)				Maximum HQ
				Aluminum	Cadmium	Copper	Zinc	
Mineral Creek	South Fork Mineral Creek	M24A	9/28/2016	11	44	0.2	33	44
		M24B	9/28/2016	2	59	1	42	59
		M24D	9/27/2016	2	43	0.1	35	43
		M25	6/29/2016	8	1	0.3	1	21
			9/27/2016	21	2	0.2	1	
	located in the mainstem of Mineral Creek	M02	6/29/2016	30	16	25	18	78
			10/7/2016	78	30	45	38	
		M02B	6/29/2016	20	17	20	14	82
			10/7/2016	82	40	54	32	
		M02C	10/7/2016	148	74	72	97	148
		M02E	6/29/2016	40	21	37	23	93
			10/7/2016	93	36	48	44	
		M02K	6/29/2016	77	45	73	50	77
		M02K1	6/29/2016	44	34	113	42	113
			6/30/2016	22	5	18	5	
		M03	6/30/2016	20	5	17	5	22
			10/8/2016	1	8	21	8	
			10/8/2016	1	7	5	11	
		M04	10/8/2016	1	7	5	11	11
		M05	10/8/2016	0.9	7	5	11	11
		M12	6/7/2016	40	4	2	3	105
			6/29/2016	39	10	4	8	
			9/29/2016	105	10	4	7	
		M12A	6/29/2016	44	3	3	3	117
			9/30/2016	117	3	3	2	
		M12B	6/29/2016	45	0.9	2	0.7	137
			9/30/2016	137	0.6	2	0.6	
		M12C	6/29/2016	22	17	8	15	42
			9/30/2016	35	20	13	18	
			9/29/2016	42	19	13	18	
		M12D	9/30/2016	32	20	14	19	32
		M12E	10/7/2016	28	17	11	17	28
		M12F	10/7/2016	0.06	0.1	0.05	0.02	0.1
		M12G	10/7/2016	7	2	6	2	7
Cement Creek	Illinois Gulch	CC42	6/7/2016	0.3	0.1	0.1	0.1	6
			9/27/2016	6	0.2	0.04	0.2	
		CC43C	6/7/2016	6	0.2	0.1	0.2	6
			9/27/2016	6	0.2	0.1	0.3	
		CC43D	6/7/2016	355	18	115	16	355
		CC43E	6/7/2016	35	8	9	8	65
			9/27/2016	65	4	3	5	
	Prospect Gulch	CC24	6/8/2016	12	10	25	10	40
			9/29/2016	40	7	16	6	
		CC24B	6/8/2016	10	7	17	8	32
			9/29/2016	32	5	10	4	
Cement Creek	South Fork Cement Creek	CC14	6/10/2015	21	4	2	2	28
			9/29/2015	11	1	0.1	2	
			7/15/2015	18	0.5	0.1	2	
			6/9/2016	28	5	3	3	
			9/29/2016	11	2	0.1	2	
		CC15A	6/9/2016	9	2	1	1	10
			9/29/2016	10	1	0.2	1	
		CC16B	6/9/2016	12	2	2	1	23
			9/29/2016	23	1	0.5	1	
	located in the mainstem of Cement Creek	CC01C	7/15/2015	20	61	58	57	326
			6/29/2016	23	84	115	71	
			9/28/2016	118	252	326	233	
		CC01C1	6/29/2016	53	142	279	135	557
			9/28/2016	172	302	557	256	
		CC01C2	6/29/2016	34	99	169	87	331
			9/28/2016	93	198	331	172	
		CC01H	6/29/2016	8	16	19	12	19
			9/27/2016	8	14	13	11	
		CC01S	6/29/2016	32	14	6	8	48
			9/27/2016	48	25	5	12	
		CC01T	6/29/2016	20	12	6	7	22
			9/27/2016	22	20	9	11	
		CC01U	6/28/2016	13	11	6	7	21
			9/27/2016	21	20	9	11	
		CC02I	6/28/2016	11	14	3	14	22
			9/27/2016	22	20	9	11	

TABLE 1

Hazard Quotients in Mine Discharges and Surface Water for Aluminum, Cadmium, Copper, and Zinc at Locations Downstream of Proposed Early Interim Remedial Action Locations

Bonita Peak Mining District

Drainage	Sub-Drainage	Location	Sample Date	Hazard Quotient (HQ)				Maximum HQ
				Aluminum	Cadmium	Copper	Zinc	
Cement Creek	located in the mainstem of Cement Creek	CC38	6/7/2016	7	2	1	3	7
			9/28/2016	0.3	2	0.1	4	
		CC39	6/7/2016	25	6	7	6	78
			9/27/2016	78	5	3	5	
Animas River	Cunningham Creek	A50	6/7/2016	0.2	18	1	10	18
			9/28/2016	0.1	10	0.6	6	
		CU4A	6/7/2016	7	0.3	0.3	0.1	7
			9/28/2016	0.1	0.5	0.1	0.3	
	North Fork Animas River	A07	9/30/2015	129	51	9	30	137
			6/8/2016	49	46	9	35	
			9/30/2016	137	56	8	34	
		A07A	9/30/2015	161	55	10	32	171
			6/28/2016	75	67	16	40	
			9/30/2016	171	63	9	38	
		A07B	9/30/2015	161	55	6	37	197
			6/28/2016	81	70	14	48	
			9/30/2016	197	69	8	45	
		A07B1	6/28/2016	83	68	14	49	83
		A07B2	6/28/2016	4	0.5	0.1	0.6	4
		A07B3	6/28/2016	167	122	16	67	167
		A07C	9/30/2015	179	61	9	52	182
			6/28/2016	89	64	14	47	
			10/5/2016	182	73	10	54	
		A07D	6/28/2016	85	52	14	37	184
			6/28/2016	86	49	13	34	
			10/5/2016	184	80	19	46	
		A07D1	6/28/2016	222	147	12	107	222
		A07D2	6/28/2016	118	346	79	271	346
		A07E	6/28/2016	79	38	14	24	159
			10/5/2016	159	56	15	35	
		BB1	6/28/2016	15	110	113	101	113
	South Fork Animas River	A38	6/28/2016	0.05	0.1	0.04	3	3
			9/28/2016	0.1	0.2	0.04	3	
		A39	9/30/2015	0.3	3	2	4	13
			6/28/2016	0.5	10	2	13	
			9/28/2016	0.3	4	2	5	
		A39A	6/28/2016	0.5	11	2	13	13
		ARD1	9/29/2015	83	112	184	133	254
			6/28/2016	44	114	254	124	
			9/28/2016	115	135	205	150	
		DM32	9/29/2015	39	73	168	70	245
			6/28/2016	31	122	245	132	
			9/29/2016	0.7	0.6	0.2	0.2	
		EG3A	9/29/2015	0.1	1	1	2	15
			6/28/2016	2	11	2	15	
			9/29/2016	0.4	0.5	0.2	0.7	
		EG5	9/30/2015	0.1	1	0.6	2	15
			6/28/2016	0.5	11	2	15	
			9/28/2016	0.2	3	0.8	4	
		EG6	6/10/2015	1	11	4	17	17
			9/30/2015	0.02	2	0.4	3	
			6/28/2016	0.5	7	2	10	
			9/28/2016	0.3	3	1	4	
	West Fork Animas River	A10	6/9/2015	11	17	5	23	72
			9/29/2015	72	17	3	21	
			6/7/2016	17	14	3	19	
			9/29/2016	63	15	2	17	
		A11	6/9/2015	14	13	3	19	76
			9/29/2015	76	15	2	19	
			6/7/2016	19	11	2	17	
			9/30/2016	63	13	2	16	
		A11A	6/9/2015	79	1662	1213	2009	2057
			9/29/2015	356	1639	569	1835	
			6/7/2016	81	1555	1172	1782	
			9/30/2016			294	2057	648	1687
		A12		6/9/2015	0.2	6	0.3	16	17
			10/1/2015	5	4	0.1	14	
			6/7/2016	7	7	0.2	17	
			9/28/2016	4	4	0.1	12	
			9/28/2016	4	4	0.1	12	



TABLE 1

Hazard Quotients in Mine Discharges and Surface Water for Aluminum, Cadmium, Copper, and Zinc at Locations Downstream of Proposed Early Interim Remedial Action Locations

Bonita Peak Mining District

Drainage	Sub-Drainage	Location	Sample Date	Hazard Quotient (HQ)				Maximum HQ
				Aluminum	Cadmium	Copper	Zinc	
Animas River	West Fork Animas River	A15	6/10/2015	36	18	3	24	138
			9/29/2015	138	21	2	22	
			6/8/2016	34	16	2	21	
			9/30/2016	126	18	2	19	
		A16	9/30/2015	0.1	2	0.06	3	3
			6/28/2016	0.1	2	0.04	3	
			9/28/2016	0.8	2	0.1	3	
		A18	10/6/2016	0.4	2	1	1	2
		A18B	6/28/2016	47	9	2	8	213
			10/6/2016	213	20	3	17	
		A19A	9/30/2015	38	194	275	104	275
			9/28/2016	38	172	269	89	
		A20	6/10/2015	6	10	5	16	16
			9/29/2015	14	8	2	13	
			6/29/2016	10	9	3	14	
			9/30/2016	11	7	1	11	
		A21	9/29/2015	26	8	1	12	26
			6/29/2016	12	11	4	15	
			9/30/2016	17	8	1	12	
		A21A	9/29/2015	156	42	0.3	66	174
			6/29/2016	162	38	0.1	56	
			9/30/2016	174	46	0.2	62	
		CG11	6/9/2015	11	13	3	18	76
			9/29/2015	76	15	2	18	
			6/7/2016	17	12	3	17	
			9/30/2016	62	13	2	16	
		CG5	6/28/2016	26	96	45	117	117
			6/28/2016	26	97	44	116	
		CG5A	6/29/2016	26	95	44	120	120
		CG6	9/30/2015	157	22	2	22	157
			6/28/2016	42	14	2	14	
			9/30/2016	137	19	2	20	
		CG6A	6/29/2016	52	14	2	14	52
			6/29/2016	52	14	2	15	
		CG9	6/9/2015	12	12	3	18	82
			9/29/2015	82	15	2	18	
			6/7/2016	21	13	3	19	
			9/30/2016	64	13	2	16	
	located in the mainstem of the Animas River	A29	6/9/2015	16	13	91	11	170
			9/30/2015	21	15	170	13	
			6/7/2016	18	14	99	11	
			9/28/2016	18	13	106	10	
		A29A	6/9/2015	9	13	28	11	28
			6/7/2016	1	14	19	10	
		A30	6/9/2015	4	9	3	10	16
			9/30/2015	16	8	1	8	
			6/7/2016	6	9	2	10	
		A30B	6/8/2016	4	8	1	8	21
			9/29/2016	21	8	0.7	7	
		DM22	6/28/2016	0.03	2	0.03	3	3
			9/28/2016	0.3	1	0.04	3	

Maximum Hazard Quotient color legend:

	HQ ≤ 1
	HQ > 1 and ≤ 25
	HQ > 25 and ≤ 100
	HQ > 100

**APPENDIX C**  
**SUMMARY OF FEDERAL AND STATE ARARS**

**Summary of Applicable or Relevant and Appropriate Requirements (ARARs)**  
**Bonita Peak Mining District Superfund Site**  
**Interim Remedial Actions (IRAs)**

	Statute and Regulatory Citation	ARAR Determination	Description	Comment	Chemical- Specific	Location- Specific	Action- Specific
<b>Federal ARARs</b>							
1	National Historic Preservation Act (NHPA) and Implementing Regulations 16 United States Code (U.S.C.) 470 36 Code of Federal Regulations (C.F.R.) Part 800	Applicable	This statute and implementing regulations require federal agencies to take into account the effect of this response action upon any district, site, building, structure, or object that is included in or eligible for the National Register of Historic Places (generally, 50 years old or older).	Only the substantive requirements of the NHPA are applicable to the IRAs.  Cultural resource surveys have not been completed for all mining-related sources addressed by the IRAs. If cultural resources on or eligible for the national register are present, it will be necessary during remedial design and remedial action to determine if there will be an adverse effect and if so how the effect may be minimized or mitigated.		✓	
2	Archaeological and Historic Preservation Act and Implementing Regulations 16 U.S.C. § 469 43 C.F.R. § 7	Applicable	This statute and implementing regulations establish requirements for the evaluation and preservation of historical and archaeological data, which may be destroyed through alteration of terrain as a result of a federal construction project or a federally licensed activity or program. Archaeological investigations conducted at a site pursuant to the Act must be conducted by a professional archaeologist.	Cultural resource surveys have not been completed for all mining-related sources addressed by the IRAs. To date, no such resources have been found at the Site. If any are found, the EPA will analyze mitigation measures, and if appropriate, those measures will be incorporated into remedial design and remedial action.		✓	
3	Historic Sites Act 16 U.S.C. § 461, <i>et seq.</i>	Applicable	The statute requires federal agencies to consider the existence and location of potential and existing National Natural Landmarks to avoid undesirable impacts on such landmarks.	Cultural resource surveys have not been completed for all mining-related sources addressed by the IRA. To date, no National Natural Landmarks have been identified at the Site.		✓	
4	Fish and Wildlife Coordination Act and Implementing Regulations 16 U.S.C. § 662, <i>et seq.</i> , 50 C.F.R. § 83 33 C.F.R. § 320-330	Applicable	This statute and implementing regulations require coordination with federal and state agencies for federally funded projects to ensure that any modification of any stream or other water body affected by any action authorized or funded by the federal agency provides for adequate protection of fish and wildlife resources.	If the IRA involves activities modifying streams or water bodies that affect wildlife and/or non-game fish, federal agencies must comply with substantive requirements identified by the U.S. Fish and Wildlife Service and the relevant state agency with jurisdiction over wildlife resources.		✓	

	Statute and Regulatory Citation	ARAR Determination	Description	Comment	Chemical-Specific	Location-Specific	Action-Specific
<b>Federal ARARs</b>							
5	Bald and Golden Eagle Protection Act 16 U.S.C. § 668 <i>et seq.</i>	Applicable	This requirement makes it unlawful for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any bald or golden eagle, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued pursuant to Federal regulations. In addition to immediate impacts, this requirement also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death or nest abandonment.	If bald or golden eagles are identified at these mining-related sources during remedial design and remedial action, activities must be modified and conducted to conserve the species and their habitat.		✓	
6	Endangered Species Act, 16 U.S.C. § 1531 <i>et seq.</i> and Implementing Regulations, 50 C.F.R. §§ 17 and 402	Applicable	This statute and implementing regulations provide that federal activities not jeopardize the continued existence of any threatened or endangered species. 16 U.S.C. § 1536(a) of the Endangered Species Act requires consultation with the U.S. Fish and Wildlife Service to identify the possible presence of protected species and mitigate potential impacts on such species. Substantive compliance with the ESA means that the lead agency must identify whether a threatened or endangered species, or its critical habitat, will be affected by a proposed response action. If so, the agency must avoid the action or take appropriate mitigation measures so that the action does not affect the species or its critical habitat. If, at any point, the conclusion is reached that endangered species are not present or will not be affected, no further action is required.	Canada Lynx (federally threatened mammal) and southwestern willow flycatcher (federally endangered bird) have been identified in San Juan County, but not necessarily found at the Site. Surveys to identify threatened and endangered species at the mining-related sources addressed by this IRA have not been completed.  If threatened or endangered species are identified at these mining-related sources during remedial design and remedial action, activities must be modified and conducted to conserve the species and their habitat.		✓	
7	Migratory Bird Treaty Act 16 U.S.C. § 703  50 C.F.R. § 10.12	Applicable	This statute and implementing regulations makes it unlawful for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued pursuant to these regulations.	If migratory birds are identified at these mining-related sources during remedial design and remedial action, activities must be modified and conducted to conserve the species and their habitat.		✓	

	Statute and Regulatory Citation	ARAR Determination	Description	Comment	Chemical- Specific	Location- Specific	Action- Specific
<b>Federal ARARs</b>							
9	Criteria for Classification of Solid Waste Disposal Facilities and Practices 40 C.F.R. §§ 257 257.2, 257.3-1, 257.3- 2(a), 257.3-2(c),	Relevant and Appropriate	This regulation establishes standards with which solid waste disposal must comply to avoid possible adverse effects on health or the environment. These criteria apply to both solid waste disposal facilities and practices that are not otherwise excepted in the regulation. Part 257.3-1 states that that facilities or practices in floodplains not restrict floods or result in washout of solid waste. Part 257.3-2 provides for the protection of threatened or endangered species.	<p>If threatened or endangered species are identified within areas designated for solid waste disposal, disposal activities must protect them.</p> <p>If floodplains are delineated within areas designated for solid waste disposal, disposal activities within them will be carried out in a manner to avoid restricting floods or resulting in washout of solid wastes.</p> <p>RCRA Subtitle D specifically regulates nonhazardous solid waste. Because the State of Colorado has been delegated the authority to implement the solid waste program regulated under RCRA Subtitle D, the substantive requirements will be enforced through the Colorado Solid Waste Regulations.</p>			✓
10	Clean Water Act 33 U.S.C. § 1342, <i>et seq.</i> , Point Source Discharges Requirements, Section 402	Relevant and Appropriate	Section 402 of the Clean Water Act, 33 U.S.C. § 1342, <i>et seq.</i> , authorizes the issuance of permits for the discharge of any pollutant. This includes storm water discharges associated with industrial activity. <i>See</i> , 40 C.F.R § 122.26(a)(1)(iii). Industrial activity includes inactive mining operations that discharge storm water contaminated by contact with or that has come into contact with any overburden, raw material, intermediate products, finished products, byproducts or waste products located on the site of such operations, <i>see</i> , 40 CFR 122.26(b)(14)(iii); landfills, land application sites, and open dumps that receive or have received any industrial wastes including those subject to regulation under RCRA subtitle D, <i>see</i> , 40 CFR 122.26(b)(14)(v); and construction activity including clearing, grading, and excavation activities, <i>see</i> , 40 CFR 122.26(b)(14)(x).	Because the State of Colorado has been delegated the authority to implement the Clean Water Act, substantive requirements will be enforced through the Colorado Pollutant Discharge Elimination System (CPDES). Blanket use of the CERCLA interim measures waiver will occur for this ARAR, as described in Section 14 of Part 2 of the IROD.			✓



	Statute and Regulatory Citation	ARAR Determination	Description	Comment	Chemical- Specific	Location- Specific	Action- Specific
<b>Federal ARARs</b>							
11	Clean Water Act 404, 33 U.S.C. § 1344, et. seq., Dredge and Fill Provisions Section 404 (b)(1) 40 C.F.R. § 230	Applicable	Section 404 regulates the discharge of dredged or fill materials into waters of the United States including return flow from such activity. This program is implemented through regulations set forth in the 404 (b)(1) guidelines, 40 C.F.R. § 230. The guidelines specify: the restriction on discharge (40 C.F.R. § 230.10); the factual determinations that need to be made on short-and long-term effects of proposed discharge of dredge or fill material on the physical, chemical, and biological components of the aquatic environment (40 C.F.R. § 230.11) in light of Subpart C through F of the guidelines; and the findings of compliance on the restrictions (40 C.F.R. § 230.12). Subpart J of the guidelines provide the standards and criteria for the use of all types of compensatory mitigation when the response action will result in unavoidable impacts to the aquatic environment.	If the remediation of mining-related sources during the IRA involves the discharge of dredged or fill materials into waters of the United States identified at the Site, activities would be implemented in compliance with substantive requirements of these regulations. The in-stream mine waste IRA is expected to the only IRA that could result in the discharge of dredged or fill materials into waters of the United States.		✓	✓
12	National Forest Management Act (NFMA)	To be Considered	The National Forest Management Act (NFMA) is the primary statute governing the administration of National Forest System (NFS) land. It was passed in 1976 as an amendment to the Forest and Rangeland Renewable Resources Planning Act of 1974, which called for the management of renewable resources on NFS land. The NFMA requires the Secretary of Agriculture to assess forest lands, develop a management program based on multiple-use, sustained-yield principles, and implement a resource management plan for each unit of the NFS. The NFMA is at 16 U.S.C. §§ 1601-1614.	This statute required the development of the San Juan National Forest and Tres Rios Field Office Land and Resource Management Plan to govern activities performed on NFS land. Activities conducted during the IRA on NFS-managed land would consider pertinent information within the Plan developed as a result of this Act.		✓	

	Statute and Regulatory Citation	ARAR Determination	Description	Comment	Chemical- Specific	Location- Specific	Action- Specific
<b>Federal ARARs</b>							
13	The San Juan National Forest and Tres Rios Field Office Land and Resource Management Plan	To be Considered	<p>The purpose of this Land and Resource Management Plan (LRMP) is to provide strategic guidance for future management of all National Forest System (NFS) lands managed by the San Juan National Forest (SJNF) and lands within the Tres Rios Field Office (TRFO) administered by the Bureau of Land Management (BLM), except for those lands included in the BLM's Canyons of the Ancients National Monument. This LRMP guides the restoration or maintenance of the health of these lands to promote a sustainable flow of uses, benefits, products, services, and visitor opportunities. It provides a framework for informed decision making, while guiding resource management programs, practices, uses, and projects. It does not include specific project and activity decisions. Those decisions are made later, after more detailed analysis and further public involvement.</p> <p>The San Juan National Forest and Tres Rios Field Office Land and Resource Management Plan is available at:  <a href="https://www.fs.usda.gov/detail/sanjuan/landmanagement/planning/?cid=stelprdb5432707">https://www.fs.usda.gov/detail/sanjuan/landmanagement/planning/?cid=stelprdb5432707</a></p>	<p>The Plan contains standards and management direction for all actions to be taken on NFS land within the San Juan National Forest boundaries. Any remedial and removal action decisions made under CERCLA would be expected to consider pertinent standards and management direction (collectively, "plan components") set forth in the Plan.</p> <p>Standard and Guidelines from the Plan that may be applicable are: Abandoned Mine Lands and Hazardous Materials 2.21.1 through 2.21.9, Acid-Mine Runoff, 2.3.56, 2.5.26, Riparian Area and Wetland Ecosystems, 2.4.20, Aquatic Ecosystems and Fisheries, 2.5.18, 2.5.19, 2.5.25, Water Resources, 2.6.29, 2.6.30, 2.6.34, 2.6.39, Bats, 2.3.37, 2.3.38, 2.3.51-54, Fens, 2.4.7, Roads, 2.13.22, 2.13.23, 2.13.24.</p>		✓	
14	Statement of Procedures on Floodplain Management and Wetlands Protection 40 CFR Part 6, Appendix A	Relevant and Appropriate	40 CFR Part 6, Appendix A contains EPA's statement of procedures for carrying out the provisions of Executive Order 11988 (Floodplain Management) and 11990 (Protection of Wetlands).	If the IRA involves activities that affect floodplains or wetlands, activities will be carried out in a manner to avoid adversely affecting them or mitigate impacts.		✓	✓
15	Floodplain Management Regulations Executive Order No. 11988	To be Considered	This Executive Order requires federal agencies avoid, to the extent possible, adverse effects associated with direct or indirect development of a floodplain, or to minimize adverse impacts if no practicable alternative exists.	If floodplains are identified within areas designated for the IRA, activities actions will be carried out in a manner to avoid adversely affecting them or mitigate impacts.		✓	
16	Protection of Wetlands Regulations Executive Order No. 11990	To be Considered	This Executive Orders requires federal agencies to avoid, to the extent possible, the adverse impacts associated with the destruction or loss of wetlands and to avoid support of new construction in wetlands if a practicable alternative exists.	If jurisdictional wetlands are identified within areas designated for the IRA, activities will be carried out in a manner to avoid adversely affecting them or mitigate impacts.		✓	✓

	Statute and Regulatory Citation	ARAR Determination	Description	Comment	Chemical-Specific	Location-Specific	Action-Specific
<b>State ARARs</b>							
1	Colorado Basic Standards for Groundwater, 5 Colorado Code of Regulations (CCR) 1002-41, pursuant to Colorado Revised Statutes (C.R.S.) §§ 25-8-101-703	Applicable	Establishes basic Statewide water quality standards for ground water, specific water quality standards for ground water, and an antidegradation rule.	Applicable if there is potential for groundwater infiltration from water management during pond draining and precipitate sludge dewatering, or from interim waste materials management at mining-related sources. Blanket use of the CERCLA interim measures waiver will occur for this ARAR, as described in Section 14 of Part 2 of the IROD.			✓
2	Colorado Basic Standards and Methodologies for Surface Water, 5 CCR 1002-31, pursuant to C.R.S. §§ 25-8-101-703	Applicable	Establishes Statewide water quality standards, specific surface water quality standards, and an antidegradation rule.	Applicable to stormwater discharges during construction and any other point source discharges during operations for run-on and adit discharge controls. Also, applicable if potential for surface or groundwater impacts from water management during pond draining and precipitate sludge dewatering, or from interim solid waste materials management at mine location.	✓		✓
3	Colorado Surface Water Quality Classifications and Numeric Standards, 5 CCR 1002-34, pursuant to C.R.S. §§ 25-8-203 and 204	Applicable	Assigns Statewide water quality standards and classifications for State surface and ground waters.	Applicable to stormwater discharges during construction and any other point source discharges during operations for run-on and adit discharge controls. Also, applicable if potential for surface or groundwater impacts from water management during pond draining and precipitate sludge dewatering, or from interim solid waste materials management at mine location. Blanket use of the CERCLA interim measures waiver will occur for this ARAR, as described in Section 14 of Part 2 of the IROD.	✓		
4	Colorado Discharge Permit System Regulations, 5 CCR 1002-61, Regulation No. 61, pursuant to C.R.S. § 25-8-501 -509	Applicable	Establishes program for permitting discharges of pollutants from a point source into waters of the United States within Colorado during remediation construction	Applicable to stormwater discharges during construction and any other point source discharges during operations for run-on and adit discharge controls. Also, applicable if potential for surface or groundwater impacts from water management during pond draining and precipitate sludge dewatering, or from interim solid waste materials management at mine location.  Only substantive requirements apply. Blanket use of the CERCLA interim measures waiver will occur for this ARAR, as described in Section 14 of Part 2 of the IROD.			✓

	Statute and Regulatory Citation	ARAR Determination	Description	Comment	Chemical-Specific	Location-Specific	Action-Specific
<b>State ARARs</b>							
5	Colorado Effluent Limitations, 5 CCR 1002-62, pursuant to C.R.S. § 25-8-205	Applicable	Sets numeric limits for certain discharge permits except storm water discharge permits.	Applicable to stormwater discharges during construction and any other point source discharges during operations for run-on and adit discharge controls. Also, applicable if potential for surface or groundwater impacts from water management during pond draining and precipitate sludge dewatering, or from interim solid waste materials management at mine location. Blanket use of the CERCLA interim measures waiver will occur for this ARAR, as described in Section 14 of Part 2 of the IROD.			✓
6	Colorado Solid Waste Disposal Sites and Facilities Regulations, 6 CCR 1007-2, pursuant to C.R.S. §§ 30-20-100.5 et seq. §§ 30-20-101-515	Applicable	Establishes requirements and procedures for land disposal of solid wastes.	Pursuant to the Solid Wastes Disposal Sites and Facilities Act, C.R.S. § 30-20-102(4), mining operations including reclamation activities with approved reclamation plans under a Colorado Mined Land Reclamation Board (MLRB) permit may dispose of solid wastes generated by such operations within the permitted area without obtaining a Certificate of Designation. CDPHE interprets this provision to allow CERCLA response actions performed consistently with the MLRB regulation 2 CCR 407-1 Rule 3 (Reclamation Performance Standards) to be compliant with Colorado's regulations pertaining to solid waste disposal.		✓	✓
8	Colorado Fugitive Dust Control Plan/Opacity, Regulation No. 1., 5 CCR 1001-3, pursuant to Colorado Air Pollution Prevention and Control Act, C.R.S. §§ 25-7-101 et. seq.	Applicable	Establishes regulations concerning fugitive emissions from construction activities, storage and stockpiling activities, haul trucks, and tailings ponds.	Applicable to all activities generating dust.			✓
9	Colorado Mined Land Reclamation Act, C.R.S. §§ 34-32-101 et. seq. and regulations 2 CCR 407-1 Rules 1.1 and 3 - 3.1.5(3); 3.1.6(3); 3.1.10(6), (7), and (8)	Relevant and Appropriate	Establishes performance standards for reclamation of permitted mined lands. Reclamation activities including grading, revegetation, and weed control must be conducted in a manner to stabilize surfaces and control erosion and siltation.	Substantive requirements are relevant and appropriate to mine reclamation activities including grading, revegetation, and weed control.		✓	✓

	Statute and Regulatory Citation	ARAR Determination	Description	Comment	Chemical-Specific	Location-Specific	Action-Specific
<b>State ARARs</b>							
10	Colorado Noxious Weed Act and the San Juan County Noxious Weed regulations, C.R.S. § 35-5.5-101-119; 8 CCR 1206-2	Applicable	Colorado and San Juan County regulations addressing management of noxious weeds.			✓	
11	Colorado Wildlife Enforcement and Penalties Act, C.R.S. §§ 33-6-101 to 130	Applicable	Prohibits actions detrimental to wildlife, and establishes provisions governing the taking, possession, hunting, and use of wildlife and migratory birds.	Applicable to all activities. Compliance achieved through coordination with the Colorado Division of Parks Wildlife.		✓	✓
12	Colorado Non-game, Endangered, or Threatened Species Act, C.R.S. §§ 33-2-101-108	Applicable	Protects endangered and threatened species and preserves their habitats. Requires coordination with the Division of Wildlife if remedial activities impact nongame wildlife deemed to be in need of management.	Applicable to all activities. Compliance achieved through coordination with the Colorado Division of Parks Wildlife.			✓
13	Colorado Wildlife Commission Regulations, 2 CCR 406, pursuant to C.R.S. §§ 33-2-101-108	Applicable	Establishes specific requirements for protection of wildlife.	Applicable to all activities. Compliance achieved through coordination with the Colorado Division of Parks Wildlife.			✓
14	Colorado Noise Abatement Statute, C.R.S. §§ 25-12-101-110	Applicable	Establishes maximum permissible noise levels for particular time periods and land use zones.	Applicable to all construction, transport, and disposal activities.			✓
15	Colorado Environmental Covenants Statute, C.R.S. § 25-15-317 <i>et seq.</i>	Applicable	Requires environmental covenants (ECs) or notices of environmental use restrictions (RNs) for environmental remediation projects resulting in: residual contamination at levels that have been determined to be safe for one or more specific uses, but not all uses; or incorporation of engineered features or structures requiring monitoring, maintenance, or operation, or that will not function as intended if disturbed.	The substantive requirements of the Colorado Environmental Covenants Statute are applicable to components of the selected interim remedy which incorporate engineered remedial features likely to be permanent. C.R.S. § 25-15-321 authorizes CDPHE to accept, refuse to accept, conditionally accept, hold, modify and terminate ECs and RNs. Concurrence on this ROD constitutes CDPHE's agreement to accept land use restrictions associated with engineered remedial features likely to be permanent, as described in 13.0 of the Interim Record of Decision. Further, CDPHE states through concurrence on this ROD that ECs and RNs will only be modified or terminated to reflect changes made to the Superfund remedy (i.e. changes to the engineered remedial features identified as likely to be permanent).		✓	✓



## **RESPONSIVENESS SUMMARY**

## RESPONSIVENESS SUMMARY

### 1.0 OVERVIEW AND BACKGROUND ON COMMUNITY INVOLVEMENT

Community involvement is an important aspect of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process. The U.S. Environmental Protection Agency (EPA) is implementing a robust program of community participation at the Bonita Peak Mining District (BPMD) Superfund Site (Site) that exceeds the requirements of CERCLA. EPA began community involvement for the Site prior to the Site's listing on the National Priorities List (NPL) in September 2016, and active community involvement related to the Site continues today.

The following section describes some of the community involvement activities implemented at the Site since 2015. All documents described are publicly available on EPA's BPMD website ([www.epa.gov/superfund/bonita-peak](http://www.epa.gov/superfund/bonita-peak)), along with updates on the Superfund process and coming events, access to reports and plans, and Site contacts.

EPA Region 8 established two information repositories in Colorado and assisted EPA Regions 6 and 9 in establishing repositories in New Mexico and the Navajo Nation, respectively. The repositories contain basic information for public review, documents about Site activities, technical documents, the community involvement plan (CIP), and general information about the Superfund program.

Information repositories are located at the:

- Silverton Public Library, 1117 Reese Street, Silverton, Colorado
- Durango Public Library, 1900 East Third Avenue, Durango, Colorado
- Farmington Public Library, 2101 Farmington Avenue, Farmington, New Mexico
- Diné College Shiprock Campus Library, 1228 Yucca Street, Shiprock, New Mexico

The administrative record is housed at the EPA Superfund Records Center in Denver, Colorado. Information about the administrative record file and information repositories has been included in Site fact sheets and on [EPA's BPMD website](http://www.epa.gov/superfund/bonita-peak).

In late 2016 and early 2017, EPA and the Colorado Department of Public Health and Environment (CDPHE) conducted community interviews with stakeholders affected by the Site to obtain general information, identify community concerns and issues, and determine how best to communicate with the public. Interviewees included local officials and stakeholders from Silverton; San Juan County, Colorado; Durango, Colorado; La Plata County, Colorado; and the Southern Ute Indian Tribe. Findings were supplemented with information gathered during face-to-face interactions between EPA, CDPHE, and the communities.

Using the information from those interviews, a CIP was prepared and distributed in August 2017. The CIP is available on [EPA's BPMD website](http://www.epa.gov/superfund/bonita-peak).

EPA provided information about the availability of technical assistance to communities in presentations and in writing. A community advisory group (CAG) was formed in January 2019 to provide a forum for stakeholders and the Site team to share information and discuss issues related to the Superfund decision-making process.

There have been discussions in the communities about forming an organization to apply for a technical assistance grant (TAG). However, community representatives have expressed the opinion that enough technical expertise is available within the community to provide technical assistance as needed. EPA provided a technical advisor and a technical expert to the Silverton/San Juan County Planning Group through the Technical Assistance Services for Communities (TASC) program in 2016 and 2017.

EPA recognizes and acknowledges that the Silverton/San Juan County Planning Group is the entity comprised of local officials and residents that provides Silverton and San Juan County the decision-making “seat at the table,” as requested by the Governor of Colorado, Silverton, and San Juan County in their letters to EPA supporting the addition of the Site to the NPL. EPA coordinates with and involves the Silverton/San Juan County Planning Group as much as possible in all phases of work and all decisions concerning the Site.

EPA prepares fact sheets for the Site that provide information to the community at key points. Fact sheets are distributed electronically via EPA’s electronic mailing list, and are available to the public at [EPA’s BPMD website](#). Printed copies are distributed at public meetings. Examples of fact sheets issued are *Innovative Technologies*, March 2018, and *Interim Sludge Management Questions and Answers*, June 2018.

EPA posts public notices in local newspapers about public comment opportunities, upcoming events, and other Site-related information. These media outlets include the *Silverton Standard*, the *Durango Herald*, the *Durango Telegraph*, and the *Southern Ute Drum*.

EPA has prepared multiple presentations and handouts that provide specific information to the public. As an example, EPA has hosted fall and spring public meetings in Colorado and New Mexico, and at the Navajo Nation, to update community members about Site activities. Presentations are available on [EPA’s BPMD website](#) and include *Virtual Tour of the Water Treatment Plant at Gladstone, Colorado*; *BPMD Digging Deeper – Hydrology*; *BPMD Team Biographies*; *BPMD Hydrology Path Forward*; *Summary of Superfund Resources Available to Communities*; and *Introduction to Risk Assessment*.

EPA issued its *Proposed Plan for Interim Remedial Actions* on June 14, 2018. The proposed plan was made available in electronic format at the four Site information repositories. An electronic notice with links to relevant documents was posted on EPA’s BPMD website throughout the public comment period.

A public meeting for the proposed plan was held on June 21, 2018, in Silverton, Colorado. EPA gave a brief presentation, and the public had an opportunity to provide oral and written comment. A stenographer provided transcription services for the meeting, and the transcript and a videotape of the presentation were made available on [EPA’s BPMD website](#).

The 30-day public comment period for the proposed plan began on June 14, 2018, and was extended for an additional 30 days (through August 15, 2018) at stakeholder request.

Announcement of the initial public comment period and public comment meeting were published in the June *Bonita Peak Mining District Update*, which was sent to the Site's email list on June 14, 2018. A notice of the extension of the public comment period was sent to the Site's email list July 16, 2018. Notices were also published in the *Silverton Standard*, the *Durango Herald*, the *Durango Telegraph*, and the *Southern Ute Drum*.

EPA issues monthly updates of Site activities in the form of the *Bonita Peak Mining District Update*. These two-page updates provide recent activities, upcoming events, items new to the website, and more. Spanish-language versions are also available. Past copies of the update are available to the public from the website.

EPA has conducted several tours specific to issues at the Site. These tours focused on cultural resources, the Gladstone interim water treatment plant (IWTP), and the mining-related sources at the Site.

Beginning in May 2018, EPA posted a calendar of field activities on EPA's BPMD website so local emergency managers and the public have easy access to past, current, and planned activities.

EPA uses the *2017 Animas River Alert and Notification Plan* to communicate to participants events that affect the appearance of or water quality in the Animas River. Plan participants include state and local emergency management agencies, public health departments, downstream states and tribes, and local officials.

Continued community involvement will be vital as future response actions are planned. For more information on community involvement throughout the CERCLA process, see Section 3 of Part 2 of this interim record of decision (IROD).

## **2.0 PUBLIC AND STAKEHOLDER COMMENTS ON THE SELECTED INTERIM REMEDY**

A total of 299 comments were received from 24 commenters on the proposed plan. Comments were received by mail (letters), email, and submission of oral comments at public meetings (stenographer's transcript). Submissions that covered many different topics, such as letters, were split up by EPA into individual comments by topic, using best judgement. Each submission was given a sequential individual comment identification (ID) number. Some commenters submitted comments more than once during the comment period using one or more methods (letter, email). For each ID number assigned, basic information (date received, commenter name, comment method, title) was tracked and organized in a master spreadsheet.

A summary of the number of comments made by individuals, businesses, organizations, and government entities are:

- 6 citizens – 16 comments
- Animas Rivers Stakeholder Group (2 commenters) – 61 comments
- Borrego Consulting Services, LLC – 11 comments
- CDPHE – 10 comments
- Environmental Video – 5 comments
- Geosyntec Consultants (a consultant for Eureka Gulch Properties LLC, Houghton Mountain Mines LLC, Houghton Land Preservation LLC, and Planetary Properties LLC) – 14 comments
- Navajo Nation – 23 comments
- New Mexico Environment Department – 6 comments
- New Mexico Wildlife Federation – 1 comment
- San Juan Citizens Alliance – 21 comments
- Silverton LP Gas LLC – 1 comment
- Silverton Photographics – 4 comments
- Southwestern Water Conservation District – 2 comments
- Sunnyside Gold Corporation – 50 comments
- Trout Unlimited – 22 comments
- Utah Department of Environmental Quality – 12 comments
- U.S. Forest Service – 2 comments
- Yost Brothers, LLC – 38 comments

EPA received one set of comments after the close of the comment period. The comments were labeled as “late comments” and added to the administrative record file. EPA reviewed the late comments. Consistent with 40 Code of Federal Regulations (CFR) § 300.825(c), the comments are included in the administrative record file as late comments, as opposed to being incorporated into the responsiveness summary, because none of the comments or other information submitted with the comments substantially support the need to significantly alter EPA’s selected interim remedy.

Many comments received by EPA were not directly related to the proposed interim remedial actions (IRAs) but rather focused on other activities occurring at the Site, such as treating water at the IWTP and disposing of the sludge generated at the IWTP. Of those comments related to the IRAs, the five most commonly received comments were:

- **Selection of mining-related sources (42 comments)** – Includes comments on sitewide cleanup strategy, selection criteria, and contaminant migration.
- **Effectiveness of IRAs (32 comments)** – Includes comments on lack of quantitative information, uncertainty of effectiveness, and performance monitoring.
- **Adequacy of the focused feasibility study (FFS)/proposed plan (25 comments)** – Includes comments on plan details, alternative components, and the proposed plan.
- **Risk assessment (19 comments)** – Includes comments on background, ecological risk, data evaluation, trespasser-related risk, and cleanup levels.



- **Cost effectiveness (19 comments)** – Includes comments on whether the IRAs are the best use of the dollars being spent.

A list of the primary comment categories is presented below. A summary of the content of these comments is provided in Section 3.

### **Primary Comment Categories**

1. Selection of Mining-Related Sources
2. Effectiveness of IRAs
3. Adequacy of the FFS/Proposed Plan
4. Risk Assessment
5. Cost Effectiveness
6. General Support/Opposition
7. Proposed Technical/Contracting Approach
8. Stakeholder Involvement
9. Statutory Requirements
10. Preliminary RI
11. Cost
12. Short-Term Risk
13. Waste Management
14. Limited Number of Alternatives
15. Editorial
16. Comments Not Specific to IRAs

Conflicting comments between different stakeholders were generally limited to two categories: General Support/Opposition and Stakeholder Involvement. In the General Support/Opposition category, multiple stakeholders indicated support for the IRAs discussed in the proposed plan, while other stakeholders opposed the IRAs. Within the Stakeholder Involvement category, some commenters indicated EPA provided ample engagement opportunities for stakeholders, while other commenters indicated stakeholder engagement was lacking.

## **3.0 RESPONSE TO COMMENTS NARRATIVE**

### **3.1 Responsiveness Summary Narrative for Selection of Mining-Related Sources and IRAs**

**Selection Criteria:** Several commenters indicated that it was not clear how the 26 mining-related sources were selected for inclusion in the FFS and proposed plan for IRAs. In addition, the commenters raised concerns that American Tunnel, Gold King Mine, Red and Bonita Mine, and Mogul Mine were not included in the list of mining-related sources for IRAs.

EPA completed an initial characterization of mining-related sources where IRAs to address specific contaminant migration issues might be beneficial based on technical work and data already collected by EPA, other stakeholder agencies, and advocacy groups such as the Animas River Stakeholders Group (ARSG). This included collaborative discussions with partner agencies on various approaches to performing early interim actions, such as those indicated in the proposed plan. The IRAs identified in the FFS are not meant to be inclusive of all actions required at the Site but will reduce risks and contaminant migration. The effectiveness of the IRAs will be assessed and evaluated to inform the ongoing remedial investigation (RI) and future response actions.

Concurrent with the work selected in this IROD, EPA is continuing cleanup work both under CERCLA removal and remedial authorities for the mentioned mining-related sources. EPA continues to complete response actions in the Cement Creek drainage, which include continued operation of the IWTP and efforts to control ongoing releases at the Gold King Mine, Red and Bonita Mine, and American Tunnel. EPA is also conducting ongoing RI, which includes collection of data to support evaluation of contributors of sources for contaminant loading of receiving waterways, and identifying areas where additional data is required to evaluate the Site. EPA is also evaluating various locations within the Site to be used as repositories for mine waste and IWTP sludge.

As some commenters have pointed out, past cleanup efforts at some of the mining-related sources addressed in this IROD have been conducted by multiple parties (federal, state, and/or private) and their opinion is that these mining-related sources should not be included in this IROD. While past efforts at these mining-related sources have included actions like those identified in the IRAs, there is no indication that the remedial action objectives and goals identified in this IROD would be fully achieved solely by the previous actions. In addition, follow-up maintenance activities have not been conducted at the mining-related sources to maintain the effectiveness of these previous actions to meet the requirements of the IROD.

**Contaminant Migration Issues:** The State of Colorado (represented by CDPHE) indicated the FFS was missing contaminant migration issues for certain mining-related sources. CDPHE indicated in-stream mine waste would likely need to be addressed at Natalie/Occidental Mine and Sunbank Group Mine.

As discussed in the Selection Criteria subcategory in Section 3.1, the EPA identified mining-related sources where IRAs might be beneficial through a collaborative effort with partner agencies based on technical work and data already collected. The IRAs identified in the FFS are not meant to be inclusive of all mining-related sources and potential actions required at the Site.

EPA has discussed with CDPHE the proposed mining-related sources and potential actions and has determined that the actions proposed by CDPHE in the comments will be looked at during evaluation of future response actions at the Site.

**Site-wide Strategy:** Several commenters indicated the actions included in the FFS and proposed plan are not presented as part of a long-term plan. In particular, commenters asked how these fit into the overall Site-wide strategy and how work was being prioritized.

EPA is pursuing the use of an adaptive management approach for the Site. Adaptive management is a formal and systematic site management approach that targets management and

resource decisions with the goal of incrementally reducing site uncertainties while supporting continued site progress toward achieving protection of human health and the environment. At the Site, this strategy allows for EPA to continue to address site uncertainties through an ongoing Site-wide RI while using existing information to evaluate, select, and conduct response actions. The IRAs identified in the FFS are early efforts to implement this adaptive management approach. These IRAs identified in the FFS are not meant to be inclusive of all actions required at the Site but will reduce risks and contaminant migration. The effectiveness of the IRAs will be assessed and evaluated to inform the ongoing RI and future response actions.

Concurrently with the work selected in the IROD, EPA is continuing work both under Removal and Remedial authorities, as discussed in the Selection Criteria subcategory in Section 3.1. The IRAs are not being prioritized over these other Site-wide actions but will be completed concurrently as part of the comprehensive Site-wide strategy. The IRAs are one effort in EPA's overall plan to address contamination at the Site.

### **3.2 Responsiveness Summary Narrative for Effectiveness of IRAs**

**Lack of Quantitative Information:** Several commenters expressed concern that the FFS and proposed plan lacked quantitative information about the effectiveness of the proposed IRAs. In particular, several commenters noted that EPA did not estimate baseline conditions of metals loading in streams nor the expected reductions in metals loading that would result from the proposed IRAs.

EPA is conducting an ongoing RI that includes data collection to support evaluation of contributors of sources for contaminant loading of receiving waterways and identifying areas where additional data is required to evaluate the Site. The purpose of the IRAs is to target specific contaminant migration issues for IRA while the RI is ongoing. Because a full evaluation of the contributors of natural and mining-related sources for contaminant loading has not been completed, the evaluations of baseline contaminant loading and loading reductions in the FFS are qualitative. Once that RI is complete, EPA will be able to provide a more detailed evaluation of metal loading at individual mining-related sources, which could include quantitative estimates of loading, as appropriate, given the data collected.

In addition to the ongoing RI, as noted in the Remedial Goals and Remedy Performance Monitoring subcategory in Section 3.2, remedy performance monitoring would be implemented to monitor the effectiveness of the IRAs. Remedy performance monitoring would involve surface water measurements and sample collection both upstream and downstream of mining-related sources included in the selected interim remedy to estimate the loading reduction of contaminants from the IRAs.

As discussed in the FFS, the loading of chemicals of potential concern (COPCs) is expected to decrease under the proposed IRAs because the remedial components would reduce the contact of the water with the waste, thereby reducing leaching and formation of mining-influenced water (MIW). The proposed IRAs would also provide stabilization of the mining-related sources and prevent further environmental degradation. Appendix D of the FFS provides a qualitative discussion of the protectiveness and effectiveness considerations for the alternatives addressing the five contaminant migration issues, and how the alternatives would be expected to meet remedial action objectives (RAOs).

**Uncertain Effectiveness:** Several commenters questioned the effectiveness of the proposed IRAs. In particular, some commenters indicated the effectiveness of the proposed IRAs is either unclear or speculative, and some commenters indicated the IRAs would not provide any demonstratable beneficial improvement to the conditions at the Site and may result in additional adverse impacts over existing conditions.

The IRAs described in this IROD are the first step in the remedial approach for the Site. The IRAs are not intended to fully address all potential risks at the Site, as the Site has not been fully characterized at this time. As discussed in Section 1.2.2 of the FFS, the following are the reasons for taking interim actions:

- Take quick action to protect human health and the environment from an imminent threat in the short term, while a final remedial solution is being developed; or
- Institute temporary measures to stabilize a site and/or prevent further migration of contaminants or further environmental degradation.

The IRAs described in the selected interim remedy of this IROD have been employed at similar watershed mine sites. These technologies are known to be effective at addressing the five contaminant migration issues identified for IRAs. An essential part of the IRAs is the performance remedy monitoring, which will provide EPA data about the effectiveness of the implemented measures. The effectiveness of the IRAs will be assessed and evaluated to inform the ongoing RI and future response actions.

As noted in the Lack of Quantitative Information subcategory in Section 3.2, the loading of COPCs is expected to decrease under the proposed IRAs because the remedial components would reduce the contact of the water with the waste, thereby reducing erosion and reducing leaching and formation of MIW. The proposed IRAs would also provide stabilization of the mining-related sources and prevent further environmental degradation. Appendix D of the FFS provides a qualitative discussion of the protectiveness and effectiveness considerations for the alternatives addressing the five contaminant migration issues and how the alternatives would be expected to meet RAOs.

Some response activities undertaken by the agencies, such as removing waste rock from creeks or streams, may cause localized, temporary discoloration of these streams. Although EPA would employ best management practices (BMPs) to minimize these temporary impacts, impacts cannot be entirely eliminated. In order to notify stakeholders of impact events in the most efficient and prompt way, EPA is using the 2017 Animas River Alert and Notification Plan for its communications to stakeholders related to any events that affect the appearance or water quality in the Animas River, as noted in the Short-Term Risk category in Section 3.12.

**Remedial Goals and Remedy Performance Monitoring:** Multiple commenters indicated it is not clear what the remedial goals of the IRAs are or how those goals would be met. Additionally, several commenters indicated that not enough information was included on how EPA planned to evaluate the effectiveness of the selected interim remedy.

As discussed in Section 3.5 of the FFS, the RAOs are the following:

- 1. Reduce transport from mine waste, contaminated soil, and contaminated sediment into surface water of COPCs that contribute to unacceptable ecological risks.*

2. *Reduce human exposure through ingestion and inhalation to mine waste and contaminated soils containing lead that result in greater than a 5 percent chance of exceeding a blood lead level of 5 micrograms per deciliter (µg/dL) during camping activities.*
3. *Reduce human exposure through ingestion of mine waste and contaminated soils containing arsenic that exceed risk-based levels for acute exposures during camping activities.*

The selected interim remedy, consisting of IRAs to address five contaminant migration issues, would provide stabilization of the mining-related sources and prevent further environmental degradation while meeting the RAOs. As noted in Comment the Lack of Quantitative Information subcategory in Section 3.2, the loading of COPCs is expected to decrease under the proposed IRAs because the remedial components would reduce the contact of the water with the waste, thereby reducing leaching and formation of MIW. Appendix D of the FFS provides a qualitative discussion of the protectiveness and effectiveness considerations for the alternatives addressing the five contaminant migration issues and how the alternatives would be expected to meet RAOs. Thus, the selected interim remedy would provide protection of human health and environment in the short term and is intended to provide adequate protection until a final remedy is selected.

Remedy performance monitoring would generally consist of sample collection and analysis. The specifics of the remedy performance monitoring would be determined during remedial design. However, it is anticipated that remedy performance monitoring for the four IRAs addressing ecological risks at mine portal MIW discharges, mining-related sources/stormwater interactions, mine portal pond sediments, and in-stream mine wastes would involve surface water measurements and sample collection both upstream and downstream of each mining-related source addressed by IRAs to calculate the loading reduction from the actions. In addition, remedy performance monitoring for the IRA addressing human health risks at mining-impacted recreation staging areas would include a pre-design investigation prior to the construction of covers to delineate the extent of contamination, followed by non-intrusive monitoring (i.e., inspections) after the construction of covers to confirm protectiveness of the covers.

### **3.3 Responsiveness Summary Narrative for Adequacy of the FFS/Proposed Plan**

**Alternative Components:** Two commenters, including the State of Colorado (represented by CDPHE), provided recommendations for inclusion of certain components such as environmental covenants, signs, and fencing as part of the alternatives, and requested consultation with Colorado Division of Parks and Wildlife as part of pre-construction activities. The State of Colorado (represented by CDPHE) also requested that selective capping with signage and fencing be considered for mining-impacted recreation staging areas in lieu of complete capping considered for Alternative E2.

EPA has determined the identified remedy components provide the best approach for risk reduction under the IRAs contemplated. The assumptions presented in the FFS associated with cover material, thickness of covers, types of cap layers, and/or horizontal extent of covers, were assumptions for the purposes of evaluating alternatives according to the National Oil and



Hazardous Substances Pollution Contingency Plan (NCP) criteria and developing cost estimates for the remedial alternatives. These assumptions will be finalized during the remedial design.

EPA will implement institutional controls (IC) to ensure the interim remedies remain protective pending final remediation.

**Detailed Plans:** Several commenters indicated that detailed remediation plans should be provided on a mining-related, source-specific level. In addition, other asked specific questions about how certain remedial components of the IRAs, including covers, erosion controls, and stabilization features for channels, would be constructed.

The proposed plan and this IROD describe the selected interim remedy for five IRAs and the underlying information that supports the decision for selecting the remedy. Specific details of how each selected interim remedy will be implemented at specific mining-related sources identified within the IROD for the five IRAs will be developed during the remedial design phase, which begins after the IROD is finalized. EPA will develop source-specific remediation plans during the remedial design phase. Additionally, details of the five IRAs for remedy components, such as covers, erosion controls, and stabilization features for channels, will be determined during remedial design, which is the appropriate time for those types of evaluations. Contact information for community members to communicate concerns to EPA during remedial action construction will be provided.

**Proposed Plan:** One commenter indicated that the proposed plan was too general and did not provide enough detail about the alternatives considered for the five IRAs, the concentrations of COPCs at the Site, how the alternatives would satisfy preliminary remedial action objectives (PRAOs), and how the alternatives are evaluated against CERCLA evaluation criteria.

In accordance with EPA guidance, as described in *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Documents* (EPA 1999), the purpose of the proposed plan is to briefly summarize the alternatives studied in the detailed analysis phase of the RI/FS, highlighting key factors that led to identifying the preferred alternative. The proposed plan does not provide the same level of detail as other documents (e.g., FFS) in the administrative record for the Site. The FFS, however, provides a greater level of detail, which should be sufficient to address this comment. The FFS and corresponding appendices, including the preliminary RI and risk assessment information, contain detailed descriptions of the alternatives for the five contaminant migration issues to be addressed by the IRAs, contain information on COPCs, discuss how the alternatives would satisfy PRAOs, and discuss how the alternatives are evaluated against the CERCLA evaluation criteria. Additional details of how the selected interim remedy will be implemented will be developed during the remedial design, which begins after the IROD is finalized (as detailed in the Detailed Plans subcategory in Section 3.3).

### 3.4 Responsiveness Summary Narrative for Risk Assessment

**Background:** Multiple commenters raised concern regarding the lack of discussion of the natural background conditions and how background was considered as part of the risk evaluations.

Risk assessments are still in development for the Site and will present an evaluation of Site-related risk relative to background conditions or multiple lines of evidence for evaluating

background risk, if applicable. These interim risk evaluations were developed solely to support the identification of mining-related sources that may warrant an IRA due to five specific contaminant migration issues. EPA's *Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions* guidance (EPA 1991) supports the use of preliminary investigation and risk assessment information to support an FFS and does not require the RI or risk assessments to have been completed.

Qualitative risk information may be presented if quantitative risk information is not yet available. The interim risk evaluations support the IRAs, which have been identified to reduce contributions from mining-related sources that add unacceptable human health and ecological risks in the Animas River watershed at the Site while a comprehensive remedial action is developed. The role of natural background conditions in determining nature and extent of contamination and associated unacceptable risks to human health and the environment from mining-related sources are ongoing as part of the RI and risk assessments for the Site.

**Cleanup Levels:** One commenter indicated there was no information in the proposed plan on how the cleanup levels were derived. That commenter also questioned why one cleanup level was set for lead in soil and another cleanup level was set for arsenic in waste rock piles.

In accordance with EPA guidance, as described in *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Documents* (EPA 1999), the purpose of the proposed plan is to briefly summarize the alternatives studied in the detailed analysis phase of the RI/FS, highlighting key factors that led to identifying the preferred alternative. The proposed plan does not provide the same level of detail as other Site documents. However, the FFS, which is part of the administrative record file for the Site, provides a greater level of detail, as requested by the commenter. Appendix B of the FFS (Risk Assessment Information) contains the memoranda that outline the derivation of the screening levels for lead and arsenic outlined in the proposed plan and the rationale for doing so. In brief, the screening levels were developed to be representative of recreational exposure at the Site. Recreational screening levels pertinent to the type of exposure being evaluated at the Site are not readily available. The camping scenario was selected because the camper is anticipated to be the most sedentary of receptors (i.e., not moving about being exposed to a variety of soil/mine waste sources, in contrast with a hiker, hunter, fisherman, all-terrain vehicle rider/guide, and road worker). Derivation of screening levels for a sedentary receptor allows for application of the screening levels to smaller areas, such as individual campsites. The screening values mentioned in the comment were developed for different media and/or different receptors than those that were developed for the Site. The screening value of 20,000 milligrams per kilogram (mg/kg) was developed for sediment exposure, whereas the screening value of 500 mg/kg was developed for a specific site in Texas.

For the purposes of the interim evaluation of arsenic risks, two screening levels were developed according to the type and duration of an activity that may reasonably be anticipated to occur at a location of interest. The 14-day screening level (for soil) was used for dispersed campsites where extended camping may occur, whereas the 2-day screening level (for waste rock) should be used when evaluating other types of potential recreation use areas (e.g., recreational launch points nearby where camping may occur), where a 2-day exposure is reasonable to assume. Arsenic was selected for evaluation because soil concentrations are notably elevated at several locations compared to other locations where sample were collected. The 14-day and 2-day screening levels for arsenic are presented in Appendix B of the FFS.

A 14-day screening level for lead was developed for dispersed campsites where extended camping may occur. Lead was selected for evaluation because inspection of the available campsite data revealed select locations had lead concentrations at orders of magnitude greater than the other locations. Other metals had generally similar concentrations across the campsite locations. The 14-day screening level for lead is presented in Appendix B of the FFS.

As described in the Trespasser-Related Risks comment subcategory in Section 3.4, 2-day screening levels for lead were developed in response to public comments received. Based on these comments, an alternate trespass camping scenario was evaluated to determine whether lead may pose an unacceptable risk under a shorter exposure frequency scenario. This alternate scenario evaluated an exposure frequency of 2 days per year for campers in dispersed campsites to determine if levels of lead pose a risk above a level of concern. This scenario allows evaluation of potential risk to a family camping with a child (under the age of 6 years) that unknowingly uses unmarked private property within the Site as a campsite before being discovered and asked to leave by the property owner. This information has been attached as an appendix to this IROD.

**Data Evaluation:** One commenter indicated that several sample locations were omitted from the ecological risk evaluations and other data points were mischaracterized.

The comprehensive RI and baseline ecological risk assessment are still in development for the Site. EPA will take these comments into consideration during development of the RI and the baseline ecological risk assessment for the Site. These interim risk evaluations were developed solely to support the identification of mining-related sources that may warrant an IRA. EPA's *Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions* guidance supports the use of preliminary investigation and risk assessment information to support an FFS and does not require a completed RI or risk assessments.

Qualitative risk information may be presented if quantitative risk information is not yet available. The interim risk evaluations support the IRAs, which have been identified to reduce contributions from mining-related sources that add unacceptable human health and ecological risks in the Animas River watershed at the Site while a comprehensive remedial action is developed.

It is recognized that stream flow and concentration of metals from mining-related source areas is an important consideration for identifying locations warranting remediation at the Site. This level of evaluation will be presented in the RI report and baseline ecological risk assessment for the Site. However, the purpose of the hazard quotient (HQ) evaluation presented in Appendix B, Part 2 of the FFS was to demonstrate that concentrations of metals in the main drainages at the Site (Upper Animas River, Cement Creek, and Mineral Creek), downstream of mining-related sources considered for IRAs, are highly elevated relative to screening values and thus warrant action to address the five contaminant migration issues identified in the FFS. HQs were derived using samples collected within the main drainages at the Site (Upper Animas River, Cement Creek, and Mineral Creek) and not from individual mine drainages or lower-order streams with varying flow rates and concentrations.

**Ecological Risk:** One commenter raised concerns that lead, manganese, arsenic, and mercury were not considered when presenting HQs for ecological risks, including terrestrial ecological

receptors. Another commenter questioned whether high HQs justified remediation if the flow and metal loading was very small.

It is recognized that stream flow and concentration of metals from mining-related source areas is an important consideration for identifying locations warranting remediation at the Site. This level of evaluation will be presented in the baseline ecological risk assessment for the Site. The purpose of the HQ evaluation presented in Appendix B, Part 2 of the FFS was to demonstrate that concentrations of metals in the main drainages at the Site (Upper Animas River, Cement Creek, and Mineral Creek), downstream of locations selected for IRAs, are highly elevated relative to screening values. HQs were derived using samples collected within the main drainages at the Site, not from individual mine drainages or lower-order streams with varying flow rates and concentrations.

Based on this rationale, the interim ecological evaluation in the risk memorandum of the FFS was developed to solely support the identification of mining-related sources that may warrant an IRA for the five contaminant migration issues identified in the FFS. The terrestrial ecological risk assessment is currently in the early stages of development and interim ecological evaluation is only intended to provide an evaluation related to aquatic ecological risk, primarily risks to fish.

The goal of the HQ evaluation was accomplished by presenting HQs for select metals that are typical risk drivers for aquatic receptors at mining-impacted sites. It was not necessary to develop and present HQ values for all metals at the Site.

**Trespasser-Related Risks:** One commenter indicated she is a property owner of one of the mining-related sources considered for IRA and disagreed with prioritizing the proposed action for her property. The commenter also noted that her property was private, access to the property was blocked to the public, and it was not a campground; therefore, her property should not be evaluated as a campground for IRA.

As described in Appendix B, Part 1.1 of the FFS, an interim evaluation of potential lead risks from exposures to lead in soil/waste rock at the Site was completed. This interim lead risk evaluation was developed to support the identification of mining-related sources that may warrant IRAs. Campground 4 was considered in the FFS and the associated human health risk memorandum as a mining-related source that could pose unacceptable human health risks from use as a recreation staging area, which could include camping. The human health risk evaluation supporting the FFS reviewed a 14-day camping scenario with a focus on exposure to children based on residential and camping soil ingestion rates. Campsite soil samples were collected from multiple surficial locations and composited prior to analysis. This interim evaluation of potential lead risks was based on samples collected by EPA, and identified two dispersed campsites (Campground 4 and Campground 7) with levels of lead that exceed all screening levels developed for consideration in the FFS.

Based on these comments provided by the property owner, an alternate trespass camping scenario was evaluated to determine whether heavy metals (lead in particular) may pose an unacceptable risk under a shorter exposure frequency scenario (i.e., less than 14 days), as documented in Appendix B, Part 1.1 of this IROD. This alternate scenario evaluated an exposure frequency of 2 days per year for campers in dispersed campsites to determine if levels of lead pose a risk above a level of concern. This scenario allows evaluation of potential risk to a family camping with a child (under the age of 6 years) that unknowingly uses unmarked private

property within the BPMD as a campsite before being discovered and asked to leave by the property owner. The screening levels developed for the 2-day exposure are based on a target blood lead level recommendations from the Center for Disease Control, as described in Appendix B, Part 1.1 of this IROD. This alternate exposure scenario evaluation indicates that even if the exposure frequency were assumed to be only 2 days per year, lead concentrations at Campground 4 would still be well above risk-based recreational screening levels, which supports the conclusions of the FFS. This information has been attached as an appendix to this IROD.

As identified by the commenter (Campground 4), while signs are posted at the property indicating that the land is private property, EPA and CDPHE have witnessed campers at the property on multiple occasions and observed signs of camping (i.e., fire rings), which supports the inclusion of Campground 4 as a recreation staging area requiring an IRA.

### **3.5 Responsiveness Summary Narrative for Cost Effectiveness**

Several commenters raised concerns about the cost effectiveness of the proposed IRAs. In particular, the commenters thought that the money for the proposed IRAs could be spent for other actions at the Site that would be more beneficial/effective than the proposed IRAs. In addition, multiple commenters indicated there is no cost/benefit analysis to understand the metals reduction that will be achieved compared to the money spent on these actions.

A cost-effectiveness determination is required as part of the two-step remedy selection process indicated at 40 CFR §300.430(f). Specifically, 40 CFR §300.430(f)(1)(ii)(D)) describes how cost-effectiveness is determined as:

*Cost-effectiveness is determined by evaluating the following three of the five balancing criteria to determine overall effectiveness: long-term effectiveness and permanence, reduction of toxicity, mobility, or volume through treatment, and short-term effectiveness. Overall effectiveness is then compared to cost to ensure that the remedy is cost-effective. A remedy shall be cost-effective if its costs are proportional to its overall effectiveness.*

Section 14.0 in Part 2 of the IROD provides EPA's analysis and determination of cost-effectiveness, as provided by the NCP. Per the NCP [40 CFR 300.430(e)(9)], the FFS included a qualitative and comparative analysis of the individual balancing criteria of long-term effectiveness and permanence, reduction of toxicity, mobility, or volume through treatment, short-term effectiveness, implementability, and cost. Further, as discussed above, the IROD includes the agency's determination of how the selected interim remedy is cost-effective as the NCP requires (see Section 14.0 of Part 2 of the IROD).

The proposed IRAs address five contaminant migration issues at total of 23 different mining-related sources. Thus, the proposed IRAs target almost half of the 48 mining-related sources that were identified in the Site's listing on the NPL. The total costs presented in the remedial alternative cost estimates include both the initial construction costs and the costs for 15 years of post-construction operations and maintenance (O&M) for 23 different mining-related sources. Depending on the timing and determination of the final remedy for the Site, O&M may not be required for the full 15 years.

As noted in the Lack of Quantitative Information subcategory in Section 3.2, the loading of COPCs is expected to decrease under the proposed IRAs because the remedial components



would reduce the contact of the water with the waste, thereby reducing erosion and reducing leaching and formation of MIW. Appendix D of the FFS provides a qualitative discussion of the protectiveness and effectiveness considerations for the alternatives addressing the five contaminant migration issues and how the alternatives would be expected to meet RAOs.

Multiple commenters noted that money would be better at other areas of the Site, specifically at the Gladstone IWTP. The scope of the IRAs and the cost-effectiveness determination for the selected interim remedy in the IROD is specific to the contaminant migration issues identified in the FFS (including mine portal MIW discharges, mining-related source/stormwater interactions, mine portal pond sediments, in-stream mine wastes, and mining-impacted recreation staging areas) and not other contamination-related issues existing at the Site. While the comments on the Gladstone IWTP and other areas outside of the IRAs do not directly impact the scope of this IROD, they will be considered when EPA plans future efforts and response actions for the Site. Additionally, as noted in the Site-wide Strategy subcategory in Section 3.1, these IRAs are part of a Site-wide strategy, with future response actions to address other areas of the Site.

### **3.6 Responsiveness Summary Narrative for General Support/Opposition**

Several commenters provided commenters indicating their general support or opposition to the proposed IRAs. In addition, multiple commenters indicated support for the comments submitted by Peter Butler (ARSG) and asked for careful consideration of those comments.

EPA sought, in its proposed plan and selected interim remedy, to develop protective and cost-effective alternatives that balance several important factors, including the ability to take quick action to protect human health and the environment in the short term while a final remedial solution is being developed, and stabilizing mining-related sources to prevent further migration of contaminants.

While ongoing characterization is needed for the Site-wide RI, a review of initial data has identified multiple types of contaminant migration issues that could be mitigated by IRAs. This initial characterization identified 26 mining-related sources (reduced to 23 mining-related sources in the IROD) where IRAs would be appropriate to reduce contributions from these mining-related sources that add to unacceptable human health and ecological risks in the Animas River watershed at the Site in advance of comprehensive remedial action. As stated in Section 12 of Part 2 of the IROD, the selected interim remedy, consisting of IRAs for five contaminant migration issues at various mining-related sources, will protect human health and the environment in the short term and is intended to provide adequate protection until a final remedy is selected.

The selected interim remedy is interim in nature, and while it targets five specific contaminant migration issues, it does not address the full extent of remedial activities that will be conducted at the Site. Once a Site-wide RI is completed, the final remedial decisions for the entire Site will be made in a final record of decision.

### **3.7 Responsiveness Summary Narrative for Proposed Technical/Contracting Approach**

**Technical Approach:** A few commenters recommended looking at treatment approaches for the IRAs. One commenter indicated his proposed technical approaches for IRAs (including

treatment technologies) would allow EPA to meet the requirements of the EPA Technology Policy and would provide greater protection and effectiveness than the proposed IRAs.

As discussed in the Hazardous Determination subcategory in Section 3.13, the scope of the IRAs do not necessitate treatment because EPA has determined that the contaminated media addressed by these IRAs do not involve principal threat waste and these IRAs do not constitute the final remedy. The IRAs exclude treatment of MIW discharged from mine portals. Untreated wastes for IRAs will be managed locally at the mining-related source on an interim basis for the IRAs until a final remedy is selected. Treatment media that bind contaminants in solid sources would make it more difficult to remove and relocate wastes later. Local management of wastes on an interim basis for the IRAs will consider design features and BMPs to minimize contaminant migration without the need to specifically treat wastes. Although gravity dewatering may result in positive benefits to geotechnical stability for excavated mine wastes, it is not considered treatment per the NCP, as it does not result in permanent or irreversible reductions in toxicity, mobility, or volume of contamination. Additional dewatering could be implemented for saturated mine wastes through ex situ amendment with a dewatering agent, as necessary, for handling and geotechnical stability prior to interim management at the mining-related source. Permanent solutions and alternative treatment technologies or resource recovery technologies will be addressed as part of the final response action rather than these IRAs.

EPA agrees with the commenters that treatment approaches should be evaluated at the Site. Evaluating and implementing treatment approaches is part of EPA's adaptive management strategy, as funding allows. EPA is currently evaluating treatment options at select mining-related sources. When a remedial approach has been developed, EPA will present the option to the public as part of future FSs. EPA encourages the public to continue sharing ideas related to treatment approaches or actions at the Site which could be evaluated as part of future FSs.

**Procurement/Contracting Approach:** One commenter provided recommendations regarding procurement and contracting of the IRAs for EPA's consideration. The suggestions focused on expanding the procurement subcontracting opportunities based on performance, competition, and best value to the government.

EPA is required to follow the specifications set forth in Federal Acquisition Regulation (FAR). The FAR is the principal set of rules in the FAR System regarding government procurement in the United States and is codified in Chapter 1 of Title 48 of the CFR (48 CFR 1).

### **3.8 Responsiveness Summary Narrative for Stakeholder Involvement**

Comments received regarding stakeholders were mixed. Some comments (e.g., from the San Juan Citizens Alliance) were encouraged by the community and stakeholder outreach associated with this proposed plan, whereas other comments (e.g., from Sunnyside Gold Corporation) suggested that EPA failed to consider stakeholder input. Other commenters requested that EPA engage additional governmental agencies regarding future action.

EPA completed an initial characterization of mining-related sources where IRAs to address specific contaminant migration issues might be beneficial based on technical work and data already collected by EPA, other stakeholder agencies, and advocacy groups such as the ARSG. This included collaborative discussions with partner agencies on various approaches to performing early interim actions such as those indicated in the proposed plan. The partner

agencies included the Bureau of Land Management (BLM), CDPHE, U.S. Forest Service (USFS), and Colorado Division of Reclamation, Mining and Safety. During this initial characterization, there were several mining-related sources located on BLM land identified as having the potential to receive some benefit from response actions. BLM proposed to implement response actions for these mining-related sources using their own CERCLA authority. BLM has continued to remain involved in the process of developing and reviewing the IRAs for the mining-related sources identified in the FFS and selected in this IROD.

EPA has implemented a robust program of community participation at the Site that meets and exceeds the requirements of CERCLA. EPA began community involvement for the Site prior to the Site's listing on the NPL in September 2016, and active community involvement related to the Site continues today. A summary of these activities is discussed in Section 1.0 of this responsiveness summary. During development of the FFS, EPA communicated progress towards development of the IRAs and mining-related sources identified for IRAs to the group of local officials and residents known as the Silverton/San Juan County Planning Group. In addition, EPA is working with private property owners on IRAs at certain mining-related sources, which is one of the reasons the number of mining-related sources identified for IRAs was reduced from 26 to 23 in the IROD. EPA looks forward to continued collaboration with stakeholders and the community at the Site.

EPA sought public comment on the proposed plan from June 14, 2018 to August 15, 2018. The agency received comments during a June 21, 2018 public meeting and in writing. In response to commenters and a media request, EPA took an additional outreach step and released the public comments received on EPA's *Proposed Plan for Interim Remedial Action* in advance of the publication of the IROD. EPA released the public comments on September 10, 2018. Due to heightened interest, EPA made these comments available before completing its analysis of them and prior to inclusion of the comments as part of the responsiveness summary in a published IROD. This release aligned with the agency's goal for transparency. Personally identifiable information was redacted from the comments to protect the commenter's privacy.

All stakeholder comments are important and valuable to EPA. EPA has not made any significant changes to the original proposal but has provided clarifying information based on the comments in the IROD. The comments will be further considered during the remedial design and remedial action phase, as appropriate.

### **3.9 Responsiveness Summary Narrative for Statutory Requirements**

**ARARs:** Several commenters highlighted concerns related to the applicable or relevant and appropriate requirements (ARARs) presented in the FFS and proposed plan. One commenter requested clarity about the use of environmental covenants on private and federal land and how waivers will be applied as part of the planned actions. Another commenter was concerned about the regulations protecting historic features at the Site.

EPA will implement ICs to ensure the interim remedies remain protective pending final remedies. EPA will seek environmental covenants or restrictive notices where waste is left in place above levels allowing for unrestricted use or where remediation features are located as part of an IC plan.

As noted in the FFS, the type of ARAR waiver that is anticipated to be implemented as part of the IRAs is the CERCLA interim measures waiver. By definition, that type of waiver can only apply to interim measures and does not apply to final response actions. Therefore, when the final response actions for the Site are determined in a future decision documents, the CERCLA interim measures waiver will not be available to waive ARARs. At that time, identified final ARARs will be complied with or waived using a different CERCLA ARAR waiver.

Appendix C of the FFS cited numerous rules and regulations related to protection of historic and cultural resources including the National Historic Preservation Act and Implementing Regulations, the Archaeological and Historic Preservation Act and Implementing Regulations, and the Historic Sites Act. As noted in Section 5.4.1 of the FFS, pre-construction activities will include cultural resources surveys. If cultural resources are found, EPA will determine if there will be adverse effects on the cultural resources from the IRA as designed for the specific mining-related source in question and will either avoid the cultural resource or take mitigative steps to comply with pertinent ARARs.

**Lack of Treatment or Permanent Solutions:** Two commenters questioned whether the alternatives satisfied the statutory requirements of CERCLA § 121, including the preference for treatment as a principal element to permanently reduce the volume, toxicity, or mobility of the hazardous substances, pollutants, and contaminants. In addition, one commenter questioned whether the alternatives provided permanent solutions.

These comments address two statutory and regulatory requirements considered when selecting a remedy under CERCLA:

- Preference for Treatment as a Principal Element
- Utilization of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to the Maximum Extent Practicable

The preference for treatment determination looks at whether the selected interim remedy provides treatment as a principal element. The NCP establishes the expectation that treatment will be used to address principal threat wastes whenever practicable (40 CFR 300.430[a][1][iii][A]). Principal threat wastes are those source materials that are considered to be highly toxic or highly mobile that generally cannot be contained in a reliable manner or will present a significant risk to human health and the environment should exposure occur. As discussed in Section 11.0 of Part 2 of this IROD, EPA has determined that contaminated media addressed by these IRAs do not involve principal threat waste. In addition, because these IRAs do not constitute the final remedy, the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element will be considered and addressed by the final response action rather than these IRAs.

The utilization of permanent solutions and alternative treatment technologies determination looks at whether the selected interim remedy provides the best balance of tradeoffs among the alternatives with respect to the balancing criteria set forth in NCP §300.430(f)(1)(i)(B) such that it represents the maximum extent to which permanence and treatment can be practicably used at the Site. NCP §300.430(f)(1)(ii)(E) provides that the balancing shall emphasize the factors of “long-term effectiveness” and “reduction of toxicity, mobility, or volume through treatment,” and shall consider the preference for treatment and bias against off-site disposal. The modifying

criteria were also considered in making this determination. These IRAs are interim solutions only and are not intended to utilize permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable. Permanent solutions and alternative treatment technologies or resource recovery technologies will be addressed as part of the final response action rather than these IRAs.

**Justification for Actions:** One commenter indicated there is not justification for the actions outlined in the proposed plan because the IRAs do not meet the threshold of representing immediate threats or actions that will result in significant risk reductions.

As noted in the EPA's Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions guidance, "Early and interim action RODs do not require a completed baseline risk assessment, although enough information must be available to demonstrate the potential for risk and the need to take action." Appendix B of the FFS demonstrated the potential unacceptable risks to human health or ecological receptors from the contamination migration issues posed by the mining-related sources included in the FFS.

As noted in Section 14.0 of Part 2 of this IROD, the selected interim remedy will provide stabilization of the mining-related sources and prevent further environmental degradation, thus meeting the criteria for taking an interim action.

### **3.10 Responsiveness Summary Narrative for Preliminary RI**

**Data Evaluation:** Several commenters questioned the use of historic data from others (e.g., ARSG) or the variability of historic data when compared to data collected as part of initial RI characterization. In addition, one commenter questioned the evaluation of data at several mining-related sources.

The preliminary RI was limited in scope, and its purpose was solely to support the development of the FFS for remedial alternatives to address five contaminant migration issues. The preliminary RI was not meant to be a comprehensive evaluation of the entire Site nor the universe of characterization data that exist for the Site. The preliminary RI met the requirements of a preliminary site characterization summary, as described in *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA* (EPA 1988). The comprehensive RI of the Site is ongoing, and additional data collection activities are needed to fully determine the nature and extent of impacts and characterize fate and transport pathways at the mining-related sources within the Site. That RI will include evaluation of available historical data for the mining-related sources, including data collected by the Colorado Division of Minerals and Geology and ARSG as part of previous investigative efforts.

Regarding the specific comments related to the Boston Mine, London Mine, and Sunbank Group Mine, the additional detailed interpretation of Site data will be included in the comprehensive RI report, as investigations at the Site are ongoing. However, some portions of the specific comments related to flow measurement information in the preliminary RI report were helpful and considered for incorporation into the IROD. An addendum to the preliminary RI report was prepared to address a discrepancy in flow measurement date and location at the London Mine, and to clarify dates of flow measurements collected at several locations presented in the preliminary RI report.



### 3.11 Responsiveness Summary Narrative for Cost

Multiple commenters had concerns about the costs that were presented in the FFS and proposed plan. Three commenters indicated that they thought the costs were too high, while other commenters indicated that they thought costs were double counted or that costs should be presented on a mining-related, source-specific basis rather than on a contaminant migration issue-specific basis. The State of Colorado (represented by CDPHE) recommended adding additional text delineating O&M cost responsibilities.

EPA documented the assumptions used in developing the remedial alternative cost estimates within Appendix F of the FFS. Cost estimates were developed consistent with EPA's guidance for FS cost estimates *A Guide to Developing and Documenting Cost Estimates During the Feasibility Study*, and include the level of detail and cost estimating backup (i.e., calculation sheets and supporting unit cost data) necessary to meet the accuracy requirements for FS cost estimates. EPA cost estimating guidance states that the purpose for FS cost estimates is to compare remedial alternatives during the remedy selection process, not for establishing construction project budgets nor for negotiating Superfund settlements with potentially responsible parties to pay for cleanups. The total costs presented in the remedial alternative cost estimates include both the initial construction costs and the costs for 15 years of post-construction O&M. Depending on the timing and determination of the final remedy for the Site, O&M may not be required for the full 15 years.

The cost estimates in the FFS are sufficient for comparing remedial alternatives and selecting a remedy, but are not intended to be highly accurate because the level of detail for the scope of the alternatives in a FS is much lower than later, during design and construction of a remedy, when more data are available and there is a better understanding of the construction timelines and funding. This is particularly true of projects such as the BPMD IRAs cleanup, where a large number of mining-related sources are being considered for IRAs addressing five different contaminant migration issues, so the sequencing of construction work is complex. The cost estimates are developed to reflect the understanding of the alternatives as described in the FFS given the uncertainties that exist and will continue to exist even after a decision on a remedy approach is made, prior to remedial design and construction.

Multiple commenters raised concern about whether some costs were double counted. As noted in Section 6.1.7 of the FFS, the alternative-specific costs exclude consideration of other remedial alternatives that address other contaminant migration issues at the same mining-related sources and locations due to uncertainties such as phasing and funding of the IRAs over the period of implementation. Thus, some common cost elements, such as those discussed in Section 5.4.1 of the FFS (e.g., road improvements for accessing mining-related sources), may be duplicative between alternatives and may result in conservative estimates when considering concurrent implementation of alternatives during remedial action. While this may be perceived as double counting, this approach allows remedial alternatives to be more representative if they were to be implemented individually, and this approach still meets the expected accuracy of remedial alternatives cost estimates for comparative purposes.

Two commenters stated that costs should be presented on a mining-related, source-specific basis rather than on a contaminant migration issue-specific basis. Based on EPA's guidance for FS cost estimates, costs in a FS should be presented on an alternative-specific basis. Given that the remedial alternatives in the FFS were assembled to address the five individual contaminant

migration issues rather than alternatives for each mining-related source, it is appropriate that costs were presented based on the contaminant migration issues as opposed to a source-by-source basis. Additionally, as described previously, FS cost estimates are not developed for the purposes of establishing project budgets nor for allocating costs on a source-by-source basis, so that level of precision is not warranted at this phase of the CERCLA process. Detailed construction cost estimates will be developed on a source-specific basis during remedial design.

The State of Colorado (represented by CDPHE) also commented that O&M activities and related costs should identify the party or parties responsible for them. The FFS and IROD should not identify parties and their cost responsibilities. As previously stated, the remedial alternative cost estimates are meant for comparative purposes to select IRAs for the five contaminant issues, not for budgeting or cost allocation.

### **3.12 Responsiveness Summary Narrative for Short-Term Risk**

Multiple commenters indicated concern over short-term risks associated with the implementation of the IRAs, such as potential unplanned discharges of MIW, fugitive dust emissions, and infiltration of MIW. The comments requested that the EPA detail what actions would be taken to reduce those short-term risks.

The proposed plan and FFS, as well as this IROD, describe the selected interim remedy for five IRAs and the underlying information that supports the decision. Use of BMPs for minimizing impacts from IRAs was identified in the description of remedial alternatives addressing the five contaminant migration issues. Specific details of how the selected interim remedy will be implemented (such as use of BMPs) at specific mining-related sources identified within the IROD for the five IRAs are typically not included in the proposed plan, FFS, and IROD, but are developed in the remedial design phase. Additionally, details of the five IRAs for BMPs and fugitive dust will be determined during remedial design, which is the appropriate time for those types of evaluations. Contact information for community members to communicate concerns to EPA during remedial action construction will be provided.

Regarding concerns of the potential for sudden, uncontrolled fluid mine waste releases occurring during implementation of IRAs, EPA will develop hazard consultation packages for CERCLA activities at abandoned hard rock mining and mineral processing sites. These consultation packages will document the review and implementation of BMPs and approaches considered for mining-related source remediation activities that could result in an uncontrolled release of MIW. The consultation packages would be developed during the remedial design for pertinent mining-related sources with the potential for uncontrolled releases.

Some response activities undertaken by the agencies, such as removing waste rock from creeks or streams, may cause localized, temporary discoloration of these streams. Although EPA would employ BMPs to minimize these temporary impacts, the impacts cannot be entirely eliminated. In addition, natural events such as large thunderstorms or incidents not related to remedial activities at the Site may also impact streams. In order to notify stakeholders of these events in the most efficient and prompt way, EPA is using 2017 *Animas River Alert and Notification Plan* for its communications to stakeholders related to any events that affect the appearance or water quality in the Animas River. EPA will use the plan, which will be updated in 2019, for proactive notifications regarding planned activities at the Site and to alert stakeholders about any impacts to streams from IRA work being conducted at the Site. In addition, field crews will use the plan

if they observe any situations not related to IRA activities that impact streams. The 2017 *Animas River Alert and Notification Plan* participants include state and local emergency management agencies, public health departments, downstream states and tribes, and local officials.

### **3.13 Responsiveness Summary Narrative for Waste Management**

**Hazardous Determination:** Two commenters provided comments relating to whether materials encountered during IRAs would be considered contaminated and/or hazardous. One commenter noted that while materials exempted under the Resource Conservation and Recovery Act's (RCRA's) Bevill amendments would not be classified as hazardous waste, those materials would still be considered hazardous substances and recommended being diligent about how the word "hazardous" is used. Another commenter questioned why it was assumed that materials excavated for the stormwater diversions' construction are uncontaminated.

Diligence must be used with respect to the word "hazardous." As noted in the FFS, mine wastes at the Site were derived directly or indirectly from the extraction of ore and thus would be exempt from management as a RCRA hazardous waste (i.e., the Bevill exemption); mine wastes would be classified as non-hazardous waste. However, these mine wastes do contain substances regulated by CERCLA, which pose contaminant migration issues and thus provide the rationale for IRAs to address them.

Materials excavated for the stormwater diversions' construction would be uncontaminated because the stormwater diversion components would be constructed uphill/upgradient from the mine workings and existing mine waste designated as mining-related sources. As such, it is expected that the native soil/rock that would be excavated would be unimpacted by the mining activity that is the cause of the CERCLA release or threatened release of hazardous substances, and represent otherwise natural conditions.

**Local Management of Wastes:** One commenter asked whether there would be sufficient capacity for local management of waste for all alternatives involving local waste management and whether ponds have sufficient capacity to manage MIW during pond sediment removals. In addition, the commenter asked why waste would be left in place and if there was a plan to remove the waste in the future.

There is sufficient capacity for local management of excavated wastes for the proposed IRAs. Local management does not necessarily specify that the excavated wastes will be managed at the mining-related source location from which it was generated. It is possible that in areas with multiple mining-related sources with proposed IRAs, the excavated wastes would be consolidated within the area of contamination into one local management area. Specifics of the local management areas will be detailed further in the remedial design using location-specific information.

Similarly, there are sufficient means to manage MIW within mine portal ponds without treatment or discharge to local waters. As described in the FFS, at mining-related sources where multiple ponds exist, MIW management from mine portals would include diversion of the MIW from one pond into the other ponds while mine portal pond sediment is being excavated. At mining-related sources where only one pond exists, mine portal pond sediment could be removed in phases using temporary berms to manage MIW within the pond. However, the exact method of MIW

management and need for discharge of MIW outside of ponds, if any, would be determined on a source-specific basis during remedial design. If discharge of MIW outside of ponds were to be required at a specific mining-related source, BMPs as described in the description of the selected alternative for mine pond portal sediments would be employed to minimize any impacts to receiving surface water bodies.

The human health risk information presented in Appendix B of the FFS indicated that mining-impacted recreation staging areas represented potential human health risks for a camping scenario. Based on the determinations made within the IROD, containment/isolation (covering) of mining-impacted recreation staging areas would be a protective and cost-effective measure for addressing the potential human health risks represented by the camping scenario. As indicated for all contaminant migration issues addressed in the FFS, final remedial approaches for managed wastes would be re-evaluated as part of future remedy decisions and response actions.

### **3.14 Responsiveness Summary Narrative for Limited Number of Alternatives**

A couple commenters indicated concern with the number of alternatives considered for each contaminant migration issue and indicated that more than two alternatives should have been evaluated.

Interim actions are meant to protect human health and the environment in the short term, while a final remedial solution is being developed. In accordance with EPA guidance, as described in *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Documents* (EPA 1999), interim actions are limited in nature and consider a limited number of alternatives (generally three or fewer). EPA determined during development of the FFS that the nature of five contaminant migration issues addressed by proposed IRAs did not warrant the development of multiple alternatives.

### **3.15 Responsiveness Summary Narrative for Editorial**

One commenter noted there was an editorial error in Section 8.1.2 of the FFS document.

The specific text identified by the commenter has been corrected in the IROD.

### **3.16 Responsiveness Summary Narrative for Comments Not Specific to IRAs**

**Community Involvement:** Several commenters provided comments regarding different topics involving community involvement. Multiple commenters indicated it was difficult for the public to understand what documents are publicly available and how to find those documents. Several commenters inquired about when public comments were due and if an extension of the public comment period was possible. One commenter indicated that the EPA has failed to give the public ample opportunity to communicate their concerns with the proposed IRAs. Lastly, multiple commenters indicated that EPA should provide an updated emergency notification plan to ensure that the community will be informed in the event of a future release.

EPA announced a 30-day public comment period and extended the comment period for an additional 30 days. This provided additional time for citizens to review and comment on the preferred alternatives for the five proposed IRAs along with supporting documentation. During the comment period, EPA accepted comments on all aspects of the interim action remedy.

Comments were accepted on the proposed plan and all supporting documents, including the preliminary RI report, FFS report, and risk assessment information. As noted in the proposed plan, Site documents are available on the EPA website at <https://www.epa.gov/superfund/bonita-peak> or by calling the EPA Superfund Records Center at 800-227-8917 ext. 312-7273. They are also available at the following information repositories:

- Silverton Public Library, 1117 Reese Street, Silverton, Colorado
- Durango Public Library, 1900 East Third Avenue, Durango, Colorado
- Farmington Public Library, 2101 Farmington Avenue, Farmington, New Mexico
- Diné College Shiprock Campus Library, 1228 Yucca Street, Shiprock, New Mexico

As discussed in the Detailed Plans subcategory in Section 3.3, specific details of how the selected interim remedy will be implemented are developed in the remedial design, which begins after the IROD is signed. To facilitate the IRAs, EPA intends to survey the mining claims associated with the mining-related sources and areas where construction may likely occur. EPA is doing this to ensure boundaries are understood before proceeding with the work and will be working with property owners during this process.

As noted in the Short-Term Risk category in Section 3.12, EPA is using the 2017 *Animas River Alert and Notification Plan* for its communications to stakeholders related to any events that affect the appearance or water quality in the Animas River. EPA will use the plan, which will be updated in 2019, for proactive notifications regarding planned activities at the Site and to alert stakeholders about any impacts to the river from work being conducted at the Site. The 2017 *Animas River Alert and Notification Plan* participants include state and local emergency management agencies, public health departments, downstream states, and tribes and local officials.

**General Comment:** Numerous commenters provided general comments and questions that were unrelated to the content of the proposed plan and corresponding documents. Some of the topics included a clarification of that commenter's own public comments, and a comment thanking EPA for the opportunity to demonstrate their technology.

These comments are on topics not related to the proposed plan. Thus, these comments are not addressed further in the responsiveness summary. However, these comments are still important and valuable to EPA. They will be considered and addressed by EPA based on the substance of the comment.

**Personal Health Concerns:** One commenter mentioned personal health concerns.

Public health issues at the Site are being investigated through a Public Health Assessment being conducted by the Agency for Toxic Substances and Disease Registry. The aim of this evaluation is to find out if people are being exposed to hazardous substances and, if so, whether that exposure is harmful and should be stopped or reduced.



**Interim Water Treatment Plant:** Several commenters provided comments about the operation of the Gladstone IWTP. Multiple commenters requested that EPA operate the IWTP at full capacity, so that discharges from additional mining-related sources can be treated there.

The expansion of the IWTP at Gladstone to treat additional sources of water was not included in the *Proposed Plan for Interim Remedial Actions at the Bonita Peak Mining District*.

EPA's current approach for improving water quality in the mining district, as reflected in the IRAs, is the remediation of sources of contamination. While the agency continues remediation work, it will also explore the option of treating more sources of mine-impacted water at the IWTP at Gladstone. The agency will consider the significant technical hurdles, including procuring and maintaining adequate facilities for impounding the large amounts of waste generated by lime treatment, and any more cost-effective alternatives to long-term treatment of large volumes of water. The Superfund process is thorough, deliberate, and designed to secure cleanup actions that are supported by sound science. When completed, detailed risk assessment documents and the full investigation of the Bonita Peak Groundwater System will inform decisions about the appropriate long-term remedial actions and technologies to be used at the site.

**Interim Sludge Management Location at Kittimac:** Several commenters provided comments about the management of sludge generated at the IWTP. Multiple commenters mentioned EPA did not provide a public comment period regarding the decision to move sludge generated at the IWTP to Kittimac. In addition, the multiple commenters stated there are environmental impacts to storing sludges at Kittimac and opposed the decision.

The establishment of the interim sludge management location at Kittimac was not included in the *Proposed Plan for Interim Remedial Actions at the Bonita Peak Mining District*.

An engineering evaluation and cost analysis (EE/CA) for the Gladstone IWTP, which included a discussion of short-term maintenance of sludge at an interim sludge management location, was prepared in advance of constructing the facility. Public comments received on the EE/CA were considered as EPA approved the Action Memorandum authorizing the operation of the IWTP. The administrative record for the Action Memorandum, including the EE/CA and other supporting documents, can be found at [EPA's BPMD website](#).

**Natural Resource Damage Assessment and Restoration (NRDA):** Three commenters requested that EPA incorporate NRDA regulations into the IRAs. The commenters requested that EPA coordinate with the applicable natural resources trustees as part of the NRDA regulations to ensure an effective restoration.

By providing a proposed plan for public comment for the proposed IRAs, EPA is, in essence, coordinating with the states' NRDA programs. EPA welcomes coordination with NRDA programs to facilitate future restoration efforts by other parties.

#### **4.0 MODIFICATIONS TO THE PROPOSED PLAN MADE AS A RESULT OF COMMENTS**

Written and oral comments provided on the proposed plan were addressed through clarification and explanation in this responsiveness summary. Based on the comments, EPA has not made any significant changes to the selected interim remedy described in the proposed plan. However, EPA has provided clarifying information in this IROD, including in addenda to the preliminary RI and the risk assessment information, which are included in Appendices A and B, respectively. It was determined that no significant changes to the remedy, as originally identified in the proposed plan, were necessary. In addition, final identification of ARAR requirements pertaining to the selected interim remedy have been made, as presented in Appendix C.

## 5.0 REFERENCES

EPA. 1988. *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA*. U.S. Environmental Protection Agency. OSWER Directive 9355.0-01.

EPA. 1991. *Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions*. U.S. Environmental Protection Agency. OSWER Directive 9355.0-30.

EPA. 1999. *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents*. U.S. Environmental Protection Agency.  
EPA 540-R-98-031.

**IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF NEW MEXICO**

THE STATE OF NEW MEXICO on  
behalf of THE NEW MEXICO  
ENVIRONMENT DEPARTMENT,

Plaintiff,

V.

UNITED STATES ENVIRONMENTAL  
PROTECTION AGENCY, ET AL.,

### Defendants.

[illegible]

C.A. No. 1:16-cv-00465-MCA-LF

**NEW MEXICO'S MOTION  
FOR LEAVE TO FILE AMENDED  
COMPLAINT**

Pursuant to Rule 15(a) of the Federal Rules of Civil Procedure, Local Rule 15.1, and the Magistrate Judge's Order dated September 21, 2016, Plaintiff, the State of New Mexico on behalf of the New Mexico Environment Department ("New Mexico"), respectfully moves this Court for leave to file its Amended Complaint. The proposed Amended Complaint is attached hereto as Attachment A.

## PROCEDURAL POSTURE

New Mexico filed suit on May 23, 2016. Shortly before filing suit, New Mexico served the United States with a demand letter pursuant to the Federal Tort Claims Act (“FTCA”). 28 U.S.C. § 2871-80. The FTCA requires that a plaintiff wait at least six months before bringing tort claims against the United States. *Id.* at § 2675(a). On July 18, 2016, Defendant Environmental Restoration, LLC (“Environmental Restoration”) filed a motion to dismiss New Mexico’s Complaint. [Doc. 32] On July 29, 2016, Defendants Kinross Gold Corporation, Kinross Gold U.S.A., Inc., and Sunnyside Gold Corporation also filed motions to dismiss. [Docs. 45 and 46] The Court has yet to rule on these motions. On September 21, 2016, United

States Magistrate Judge Laura Fashing issued an Order setting November 15, 2016 as the deadline for New Mexico to file a motion for leave to file an amended complaint, so that New Mexico could add tort claims against the United States, name new defendants, and revise the Complaint to comport with the additional information gleaned to date. [Doc. 77] New Mexico files this Motion in accordance with that Order.

### ARGUMENT

A court should “freely give leave” to amend a complaint “when justice so requires.” FED. R. CIV. P. 15(a)(2). The Tenth Circuit emphasizes that Rule 15(a) provides litigants “the maximum opportunity for each claim to be decided on its merits rather than on procedural niceties.” *Minter v. Prime Equip. Co.*, 451 F.3d 1196, 1204 (10th Cir. 2006) (citations omitted). In *Foman v. Davis*, the Supreme Court held that “[i]n the absence of . . . undue delay, bad faith or dilatory motive . . . undue prejudice . . . futility of amendment, etc.—the leave sought should . . . be ‘freely given.’” 371 U.S. 178, 182 (1962) (quoting FED. R. CIV. P. 15(a)); *Duncan v. Manager, Dept. of Safety*, 397 F.3d 1300, 1315 (10th Cir. 2005); *Frank v. U.S. West*, 3 F.3d 1357, 1365 (10th Cir. 1993). Here, the timeliness of an amendment and potential prejudice to a defendant are the heart of the inquiry. *Minter*, 451 F.3d at 1204. Neither is implicated by New Mexico’s Motion and Amended Complaint.

New Mexico’s proposed Amended Complaint is timely. This case is in its infancy: the Court has yet to issue a scheduling order or rule on the pending motions to dismiss. Further, Defendants have been aware that New Mexico intended to amend its Complaint to add claims under the FTCA against the United States once the mandatory six-month response period ended, and New Mexico has repeatedly communicated to Defendants its plan to amend. Moreover,



New Mexico's Motion is being filed according to the timeframe and deadline established in Magistrate Judge Fashing's September 21, 2016 Order.

In its proposed Amended Complaint, New Mexico seeks, *inter alia*, to add tort claims against the United States. Pursuant to the FTCA, New Mexico submitted an administrative claim to the U.S. Environmental Protection Agency ("EPA") on May 13, 2016. EPA received notice of New Mexico's claim on or about May 17. New Mexico was required to wait six months for EPA to respond to its administrative claims before filing tort claims against the United States. *See* 28 U.S.C. 2401(b); 40 C.F.R. Part 10. Because the earliest date that New Mexico could have added tort claims against the United States is November 17, 2016, the proposed Amended Complaint is timely.

New Mexico's proposed Amended Complaint will not prejudice Defendants. The proposed Amended Complaint will promote the interests of justice by clarifying the facts and law at issue in this case.<sup>1</sup> And, because the proposed Amended Complaint includes new information provided by Defendants, undue delay or bad faith is not present.

New Mexico also seeks to amend its original Complaint in light of new information produced by EPA. When New Mexico filed its Complaint in May 2016, publically available information led New Mexico to believe that Environmental Restoration was the only federal contractor responsible for the Gold King Mine release on August 5, 2015. On August 1, 2016, EPA started releasing FOIA records on a rolling basis. To date, EPA has produced more than

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<sup>1</sup> Any purported prejudice that Environmental Restoration might suffer because New Mexico did not join Weston Solutions as a defendant in its original Complaint is the result of Environmental Restoration and EPA's strategic decision to hide the identities, roles, and duties of key individuals and entities responsible for the Gold King Mine operation and release. Indeed, their heavy use of redactions frustrated New Mexico's efforts to name all responsible parties in its initial pleading. Furthermore, Environmental Restoration waited until August 25, 2016 to designate several non-parties it alleges to be at fault pursuant to COLO. REV. STAT. § 13-21-111.5(3)(5). [*see* Doc. 67.] That said, New Mexico strongly disputes Environmental Restoration's position that Colorado law controls in this case.

35,000 documents on its website. EPA produced these documents in a difficult-to-search format and the documents must be reviewed individually and line-by-line. Even so, New Mexico has diligently reviewed EPA's FOIA records since August 1, 2016, and will continue to review additional records as they become available.

Based on EPA's FOIA records, New Mexico now understands that Weston Solutions, Inc. ("Weston Solutions") and Harrison Western Corporation ("Harrison Western") played critical roles in the Gold King Mine operation and were jointly responsible for the Gold King Mine release on August 5, 2015. Because the nature and scope of Weston Solutions and Harrison Western's responsibility was not apparent when New Mexico filed suit in May 2016—largely due to confidentiality agreements and EPA's heavy use of redactions—undue delay, bad faith, or dilatory motive in adding them as defendants is not implicated here.

What is more, EPA's FOIA records illuminate the involvement of existing Defendants in activities which preceded and ultimately caused the August 5, 2015 release. Typically, leave to add clarifying factual allegations to existing claims is freely given. *See Council on American-Islamic Relations Action Network, Inc. v. Gaubatz*, 793 F. Supp. 2d 311, 324 (D.C. Cir. 2011). Indeed, factual allegations that merely fine-tune the basis for relief but do not reshape the action are rarely a bad thing. Because the proposed Amended Complaint will strengthen New Mexico's claims, and undermine defenses raised in pending dispositive motions, amendment is not futile.

Finally, New Mexico seeks to clarify the nature of the relationship between Defendant Kinross Gold Corporation and its various subsidiaries. Kinross Gold Corporation brought this issue to New Mexico's attention in its Motion to Dismiss [Doc. 47 at 7], and the Declaration of Kathleen M. Grandy [Doc. 47, Ex. 1, at ¶¶ 7-9]. New Mexico's original allegations describing

Kinross Gold Corporation's corporate structure relied on securities filings, disclosures, and other publically available information. Those allegations were made in good faith and now New Mexico seeks to correct these minor deficiencies.

### **CONCLUSION**

In sum, New Mexico seeks leave to file a proposed Amended Complaint that will (i) add tort claims against the United States; (ii) add Weston Solutions and Harrison Western as new defendants; (iii) supplement factual allegations that support and strengthen New Mexico's existing claims; and (iv) clarify the relationship between Kinross Gold Corporation and its various subsidiaries. For the foregoing reasons, New Mexico respectfully requests that the Court grant its Motion for Leave to File Amended Complaint and allow New Mexico to file its Amended Complaint, attached hereto as Exhibit A.

Dated: November 15, 2016

Respectfully submitted,



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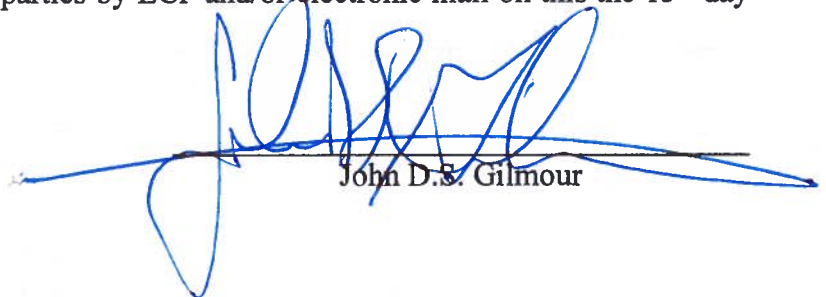
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Department*

**CERTIFICATE OF SERVICE**

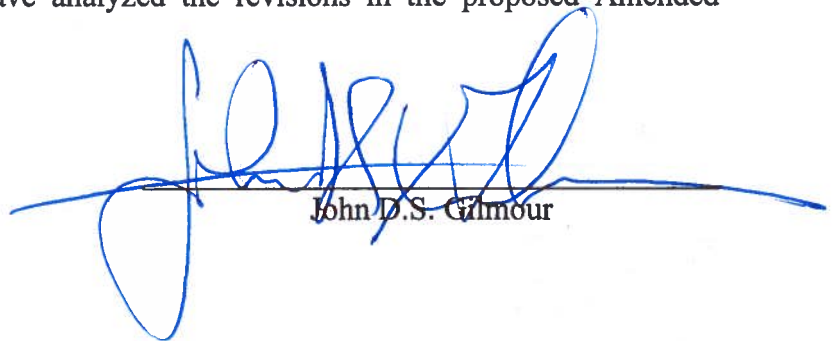
I hereby certify that a true copy of the foregoing instrument has been directed to all counsel of record and/or all interested parties by ECF and/or electronic mail on this the 15<sup>th</sup> day of November, 2016.



John D.S. Gilmour

**CERTIFICATE OF CONFERENCE**

I hereby certify that, after conferring with Defendants' counsel, Defendants stated that they are opposed to New Mexico's Motion for Leave at this time, but reserve their right to withdraw their opposition after they have analyzed the revisions in the proposed Amended Complaint.



John D.S. Gilmour

# EXHIBIT A



**IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF NEW MEXICO**

THE STATE OF NEW MEXICO  
on behalf of the NEW MEXICO  
ENVIRONMENT DEPARTMENT,

*Plaintiff,*

V.

Civ. Action No. 1:16-cv-00465-MCA-LF

UNITED STATES OF AMERICA,

UNITED STATES ENVIRONMENTAL  
PROTECTION AGENCY;

GINA MCCARTHY, in her official capacity  
as Administrator, United States Environmental  
Protection Agency;

ENVIRONMENTAL RESTORATION, LLC;

WESTON SOLUTIONS, INC.;

HARRISON WESTERN CORPORATION;

KINROSS GOLD CORPORATION;

KINROSS GOLD U.S.A., INC.; and

SUNNYSIDE GOLD CORPORATION.

*Defendants.*

## COMPLAINT

## INTRODUCTION AND STATEMENT OF THE CASE

1. On August 5, 2015, the United States Environmental Protection Agency (“EPA”) and its contractors breached a collapsed portal of the Gold King Mine, releasing over three million gallons of acid mine drainage and 880,000 pounds of heavy metals into the Animas River watershed in southwestern Colorado. This massive release quickly overwhelmed Cement Creek,

a tributary of the Animas River, and then snaked down the Animas through Colorado and into New Mexico, where the Animas joins the San Juan River. The sickly yellow plume of contamination then coursed through the San Juan River in New Mexico, the Navajo Nation, and into Utah. One week later, the plume reached Lake Powell.

2. The plume of contamination from the Gold King Mine release carried toxic heavy metals like lead, cadmium, copper, mercury, and zinc. When the plume passed through downstream communities in three states and two sovereign tribes, heavy metal concentrations in the Animas and San Juan Rivers exceeded federal and state standards for public drinking water. Along the way, a substantial amount of these heavy metals fell out of the water column and settled in the riverbeds of the Animas and San Juan. Many reaches of the Animas—on both sides of the Colorado-New Mexico state line—are now “sinks,” which have temporarily captured heavy metals from the release. Rainfall, snowmelt, and other high flow events will re-suspend these pollutants and carry them further downstream into and through New Mexico. These sources of ongoing and future discharges pose imminent and long-term health risks to the New Mexican people—particularly residents, farmers, ranchers, and recreational users of the Animas and San Juan Rivers. They also threaten fish, invertebrates, plants, and the environment in New Mexico.

3. In response to the Gold King Mine release, the State of New Mexico, joined by two other states and two sovereign tribes, declared states of emergency. The garish yellow cloud of contamination wrought environmental and economic damage throughout the Animas and San Juan Rivers and severely strained New Mexico’s already stressed water resources. The release eroded the public’s confidence in these waters: many businesses along the riverfront lost customers; others were forced to close. Agricultural uses ground to a halt. Potable water was

hailed in by truck for human and livestock consumption. Tens of thousands of local residents, farmers, anglers, and tourists could not access or enjoy the rivers. The reputation of New Mexico's prized sports fishing waters—some of the world's finest—was tarnished.

4. The immediate cause and culprits of the Gold King Mine blowout are clear. *See* Exhibits A and B. On August 5, 2015, EPA, EPA's contractors, and the Colorado Division of Reclamation, Mining and Safety ("DRMS"), used an excavator to dig away tons of rock and debris that blocked the portal of the Gold King Mine. Water had been building in the mine and seeping out of the portal for years, and EPA, the contractors, and Colorado officials knew the water was highly acidic and laced with heavy metals. Colorado's records and EPA's work plan not only recognized that the mine was filled with water, but also highlighted the risk of a significant blowout—especially if workers attempted to dig away the blockage. Yet, the work plan ignored this well-understood risk. In fact, EPA's lead official at the Gold King Mine—who was on vacation when the crew triggered the release—had ordered EPA and DRMS employees and EPA's contractors *not* to excavate the earthen debris blocking the portal and *not* to drain the mine without setting up equipment to handle the discharge. Further, the lead EPA official—recognizing the hazards at the site—told the crew to wait to excavate until after he returned from vacation and consulted with an engineer from the Department of Interior's Bureau of Reclamation about the risks of EPA's actions at the site. Despite the clear dangers and explicit directions of EPA's project leader, the on-site crew dug into the portal without verifying the hydraulic pressure or taking necessary precautions—with catastrophic consequences.

5. Although the immediate cause of the August 5 release is clear, the root cause of the hazardous condition that culminated in the disaster is more complex, dating back more than two decades. In 1996, Sunnyside Gold Corporation ("Sunnyside Gold"), the owner of the vast

Sunnyside Mine network, persuaded the State of Colorado to let it install bulkheads in two drainage tunnels below the Sunnyside Mine. These bulkheads impounded possibly billions of gallons of acid mine drainage and waste water in Bonita Peak Mountain and caused the water to flood several adjacent mines. Sunnyside Gold had been spending up to a million dollars annually to operate a water treatment facility in Gladstone that processed acid mine drainage and waste from the Sunnyside Mine and its other legacy mining sites in the Animas River watershed. Sunnyside Gold wanted to stop treating the acid mine drainage, use the mountain to essentially store its waste, and abandon its lingering environmental liabilities inside Bonita Peak. Despite understanding the inevitable consequences of plugging the Sunnyside Mine and closing the Gladstone water treatment plant, Sunnyside Gold ultimately convinced Colorado that its plan was feasible, culminating in a consent decree in 1996.

6. When Sunnyside Gold installed the bulkheads, a vast pool of acidic and toxic water rapidly built up within the Sunnyside Mine. But the bulkheads also caused water from the Sunnyside Mine to enter the workings of other mines on Bonita Peak, like the Gold King and the Mogul. Suddenly, these mines, which had been virtually dry for decades, were discharging hundreds of gallons of acid mine drainage every minute. Even worse, the Gladstone water treatment plant, which Sunnyside Gold transferred to a cash-strapped operator in 2003, was shut down in 2005, leaving these new discharges untreated. Water quality in the Animas River declined precipitously. For more than a decade, the volume of water and hydraulic pressure within these mines continued to build, while regulators and Sunnyside's parent, Kinross Gold Corporation, dismissed the problem or publically denied its existence.

7. The intentional decision to plug the Sunnyside Mine and fill Bonita Peak and numerous neighboring mines with Sunnyside Gold's acidic wastewater has damaged New

Mexico's waters, environment, people, and economy. Sunnyside Gold and its Kinross parent companies profited from their hard rock mining properties, then knowingly created and maintained an immense environmental and human health hazard to cut their water treatment costs. Then, government entities and officials entrusted to protect the environment violated mandatory safety regulations, established mine engineering standards, and deviated from their own directives, protocols, and procedures, triggering a massive release of pollutants into a river that provides drinking water to thousands of people in three states and two sovereign tribes. Downstream communities are still paying the price.

8. The State of New Mexico, on behalf of the New Mexico Environment Department ("NMED" or "New Mexico"), accordingly demands that the Defendants abate the imminent and substantial threats emanating from the mines in Colorado, and remediate residual contamination from the Gold King Mine releases in New Mexico's surface waters and sediments. Contamination from the Gold King Mine releases has combined and mingled with previous and ongoing discharges of hazardous substances, heavy metals, and acid mine waste. The Defendants are jointly and severally liable for this indivisible harm.

9. New Mexico also demands full and just compensation for its environmental and economic damages caused by the Gold King Mine release. Despite repeated requests by NMED and others, Defendants have not stepped forward to take responsibility for New Mexico's environmental and economic injuries. Therefore, New Mexico brings this lawsuit based on Defendants' violations of the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA"), 42 U.S.C. § 9607(a), the Resource Conservation and Recovery Act ("RCRA"), 42 U.S.C. § 6972(a), the Federal Clean Water Act ("CWA"), 33 U.S.C. § 1365(h),



and claims of negligence, gross negligence, public nuisance, and trespass. New Mexico seeks cost recovery, damages, injunctive relief, and attorney's fees.

### **JURISDICTION**

10. Jurisdiction is proper in this Court under 28 U.S.C. § 1331 (civil action arising under the laws of the United States), 28 U.S.C. § 1367 (supplemental jurisdiction), 28 U.S.C. § 2201 (declaratory relief), and 28 U.S.C. § 2202 (injunctive relief).

11. Jurisdiction is also proper in this Court under 42 U.S.C. §§ 9613(b) and 9613(g)(2) (CERCLA), 42 U.S.C. § 6972(a) (RCRA), and 33 U.S.C. § 1365(a) (CWA).

### **VENUE**

12. Venue is proper in this district under 28 U.S.C. §§ 1391(b) and 1391(e)(1)(B) and 42 U.S.C. § 9613(b) (CERCLA), 42 U.S.C. § 6972(a) (RCRA), and 33 U.S.C. § 1365(a) (CWA).

### **PARTIES**

13. Plaintiff, the State of New Mexico, on behalf of NMED, has authority to bring this lawsuit. NMSA 1978, § 74-6-1(A); NMSA 1978, § 8-5-2 (B); NMSA 1978, § 36-1-19(A).

14. Defendant EPA is an agency within the executive branch of the federal government. Its principal office is at 1200 Pennsylvania Avenue, N.W., Washington, DC 20460. Defendant Gina McCarthy is named in her official capacity as the Administrator of EPA. EPA has been properly served and has appeared in this matter.

15. Defendant United States includes all agencies of the federal government, including EPA. New Mexico submitted a claim to EPA on May 13, 2016 pursuant to the Federal Tort Claims Act ("FTCA"). 28 U.S.C. § 2871-80. EPA did not make a final determination of the claim within the six-month time period prescribed in 28 U.S.C. § 2675(a). Accordingly, EPA denied New Mexico's claim.

16. Defendant Environmental Restoration is a Missouri limited liability company with its principal office at 1666 Fabrick Drive, St. Louis, Missouri 63026. Environmental Restoration has been and still is EPA's primary contractor for emergency and rapid response services at the Gold King Mine. Environmental Restoration has been properly served and has appeared in this matter.

17. Defendant Weston Solutions, Inc. ("Weston Solutions") is a Pennsylvania corporation with headquarters at 1400 Weston Way, P.O. Box 2653, West Chester, Pennsylvania 19380. At all times relevant to this suit, Weston Solutions was the Superfund Technical Assessment and Response Team ("START") contractor for EPA at the Gold King and Red and Bonita Mines. Weston Solutions is registered in Colorado as a foreign corporation. It may be served through its registered agent: Prentice-Hall Corporation System, Inc., 1560 Broadway, Suite 2090, Denver, Colorado 80202.

18. Defendant Harrison Western Corporation ("Harrison Western") is a Colorado corporation with its principal office located at 1208 Quail Street, Lakewood, Colorado 80215. It may be served through its registered agent: Allan G. Provost Estate, located at the same address.

19. Defendant Kinross Gold Corporation ("Kinross") is a Canadian corporation with its principal office at 25 York Street, 17th Floor, Toronto, Ontario, M5J 2V5, Canada. Kinross currently owns the Sunnyside Mine and neighboring properties near Silverton, Colorado, through its subsidiaries Kinross Gold U.S.A., Inc. and Sunnyside Gold. Kinross has been properly served and has appeared in this matter.

20. Defendant Kinross Gold U.S.A., Inc. ("Kinross Gold U.S.A.") is a Nevada corporation with a principal office registered with the Colorado Secretary of State at 5075 S. Syracuse Street, 8<sup>th</sup> Floor, Denver, Colorado 80237. Kinross Gold U.S.A. is a subsidiary of

Defendant Kinross and has transacted business in Colorado since 2003. Kinross Gold U.S.A., Inc. has been properly served and has appeared in this matter.

21. Defendant Sunnyside Gold Corporation is a Delaware corporation with a principal office registered with the Colorado Secretary of State at 5075 S. Syracuse Street, 8<sup>th</sup> Floor, Denver, Colorado 80237. It currently owns the Sunnyside Mine and other properties near Silverton. Sunnyside Gold has been properly served and has appeared in this matter.

### **FACTUAL BACKGROUND**

#### *The Gold King Mine and Sunnyside Mine*

22. The headwaters of the Animas River begin in the San Juan Mountains of southwestern Colorado. The confluence of three streams—Mineral Creek, Cement Creek, and the upper Animas—define the Upper Animas River Basin. The river basin contains hundreds of inactive or abandoned mines, among them the Gold King Mine, on the slopes of Bonita Peak, and the much larger Sunnyside Mine, two miles west in Eureka Gulch. Bonita Peak and the surrounding topography is a maze of faults, fissures, and fractures—both natural and manmade. *See Exhibit C.*

23. The Upper Animas River Basin lies within a heavily mineralized area that was mined extensively for metals, mainly gold and silver, from the 1870s to the mid-1990s. Historic mining activities significantly increased the exposure of the mineralized rock to atmospheric conditions. This exposure increased the amount of heavy metals and acidity, known as acid mine drainage, which reaches surface water and sediments.<sup>1</sup> The most common heavy metals

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<sup>1</sup> Acid mine drainage is caused by a chemical reaction when oxygen and water flow over or through rock containing metallic minerals. The reaction causes the release of hydrogen atoms, which lowers the pH of water—making it more acidic—and dissolves metals from rock into the water. Dissolved metals can remain in the water, or eventually settle as sediment when the pH of the water rebounds. This natural reaction generally occurs when oxygen from the air is introduced into areas where it normally would not be found (*e.g.*, through drilling, excavating, or mining tunnels).

associated with acid mine drainage in the river basin are zinc, copper, lead, aluminum, iron, and manganese, with lesser amounts of other metals.

24. Discovered in 1873, the Sunnyside Mine soon emerged as one of the most prolific and profitable mines in Colorado. At the height of mining activities in the 19th and early 20th centuries, the Sunnyside mine complex was a self-contained community, complete with offices, boarding houses, a hospital, and a commissary. In 1927, the Sunnyside became the first Colorado mine to produce 1,000 tons of ore per day and had a payroll of over 500 people. The mine opened and closed many times during its life, eventually producing more than seven million short tons of ore before its final closure in 1991.

25. The Sunnyside Mine contains myriad underground workings on seven levels ranging from 10,660 feet to over 13,000 feet above sea level. The Sunnyside also includes parts of two haulage and drainage tunnels: the Terry Tunnel and the American Tunnel. The latter tunnel is actually part of the lower level of the Gold King Mine, but was renamed “the American Tunnel” in 1959. In 1960 and 1961, Standard Metals Corporation extended the American Tunnel more than a mile to intersect Sunnyside mine orebodies 600 feet below the Sunnyside mine workings. Thus, the American Tunnel is not a mine but the lowest transportation and ore-haulage level of the Sunnyside Mine. *See* Exhibit D.

26. The Gold King Mine was discovered in 1887, and ore production began in 1896. Like the Sunnyside, the Gold King contains numerous workings on seven levels ranging from 11,440 feet to 12,300 feet above sea level. At first, operations occurred at the “Upper Gold King” portal at Level 1 (12,160 feet above sea level). Later, miners developed the “Lower Gold King” tunnel at Level 7 (portal elevation 10,617 feet above sea level) to further explore the mine’s vein system.

27. In 1985, Standard Metals Corporation went bankrupt. Echo Bay Mines Inc. (“Echo Bay”), a Canadian corporation, purchased the Sunnyside Mine, operating and doing business as Sunnyside Gold.

28. In 1986, Gerber Minerals Corporation, a subsidiary of Gerber Energy Internationals Inc., acquired control of the Gold King Mine, leasing it from Pitchfork “M” Corp. Gerber Minerals Corp. also entered into an agreement with Echo Bay to develop the Gold King claims together. According to a 1986 Sunnyside Gold-Gerber Minerals Corporation venture agreement, Gerber Minerals Corporation changed its name to Gold King Mines Corporation (“Gold King Mines Corp.”)

29. In 1988, Sunnyside Gold overhauled an old water treatment facility at the historic town of Gladstone, which received acid mine drainage from the American Tunnel. Sunnyside Gold used one ton of lime per day to raise pH levels, causing toxic metals to precipitate out of solution and settle into ponds, and cleaning 1,600 gallons per minute of discharge to a level that could support sensitive aquatic life. This process cost hundreds of thousands of dollars per year to operate.

30. The main Gold King Mine claims saw little development after 1910. But in 1989, the mine’s owner, Gold King Mines Corporation (“Gold King Mines Corp.”), entered an operating agreement with San Juan County Mining Venture (whose members included Echo Bay, Sunnyside Gold, and several other corporations), to further explore the Gold King Mine. These companies attempted to revive mining operations at the Sunnyside and parts of the Gold King. Sunnyside Gold developed the “Gold King Extension” and the Gold King Extensions 1 – 5, pushing the mine works of the Sunnyside to within a few hundred feet of the Gold King workings. But faced with decreasing ore reserves and depressed gold and base metal prices,



Sunnyside Gold decided to decommission the Sunnyside Mine in 1991. Gold King Mines Corp. stopped mining the Gold King in 1992, but kept its state mining and reclamation permits active.

*Closing of the Sunnyside Mine (1991 to 2003)*

31. When Sunnyside Gold decided to close the Sunnyside Mine, the American Tunnel was discharging about 1,700 gallons of acidic water with high concentrations of metals, particularly zinc and iron, each minute. The American Tunnel was several hundred feet below the Sunnyside Mine and served as a huge drainage feature for the Sunnyside. Sunnyside Gold captured and treated the discharges at the Gladstone treatment facility to comply with federal Clean Water Act regulations and Colorado-issued discharge permits.

32. Because the treatment facility was expensive to maintain and operate, Sunnyside Gold searched for ways to end perpetual treatment of the American Tunnel's discharges. To do so, Sunnyside Gold needed to terminate the discharge permit for the facility issued by the Colorado Department of Public Health and Environment Water Quality Control Division ("WQCD").

33. Sunnyside Gold could not shut down the treatment facility without addressing the discharges from the American Tunnel. Therefore, Sunnyside Gold developed a plan to install underground hydraulic seals—called "bulkheads"—in the American Tunnel and several other mine workings to block the drainage through the workings. Sunnyside Gold submitted this plan to the Colorado Division of Minerals and Geology<sup>2</sup> and told the Division that installing the first bulkhead would create a vast pool of impounded water. Sunnyside Gold claimed that the Sunnyside Mine would continue to fill with water until the pool reached a "physical equilibrium"—the point when the amount of water flowing into the mine workings would equal

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<sup>2</sup> The Colorado Division of Minerals and Geology is the predecessor to DRMS.

the amount leaving the workings through natural fracture and fissures in the mountain. If all went according to Sunnyside Gold's plan, the discharges from the American Tunnel would cease, while any new springs or seeps that emerged after Sunnyside Gold installed the bulkheads would have the same acidity and metal loading as background groundwater.

34. WQCD raised several objections to Sunnyside Gold's plan. First, WQCD noted that the treatment facility had significantly improved water quality in Cement Creek and believed that the plan would reverse this progress and degrade the watershed. Second, WQCD doubted Sunnyside Gold's prediction that the mine pool behind the American Tunnel bulkhead would return to natural background pH and metal loading. Third, and most importantly, WQCD issued a finding that any new or increased flows to the surface caused by flooding the Sunnyside Mine would be "point sources" requiring discharge permits.

35. Because Sunnyside Gold's goal was to eliminate its discharge permit obligations, it pushed back against the agency. When the two sides could not agree on the permitting issue, Sunnyside Gold filed a lawsuit against WQCD in Colorado district court and sought a declaratory judgment on whether future seeps and springs would require permits from WQCD. Before the court could rule, however, Sunnyside Gold and WQCD settled the lawsuit and signed a consent decree in May 1996.

36. The consent decree divided Sunnyside Gold's work obligations in three parts:

i. By the end of 1996, Sunnyside Gold would install bulkheads in the American and Terry Tunnels. Then, Sunnyside Gold would monitor the rising mine pool until it reached "physical equilibrium" (determined by Sunnyside Gold and the Division of Minerals and Geology according to terms in Sunnyside Gold's mining and reclamation permit). Sunnyside Gold had to monitor the height of pool for two more years and then grout the valves and pipes in the bulkheads. Then, Sunnyside Gold could install more bulkheads in the American Tunnel. If the bulkheads eliminated the discharges from the American Tunnel (and other conditions in the consent decree were met), then WQCD would agree to terminate Sunnyside Gold's discharge permit for the treatment facility. However, Sunnyside Gold was given the option to transfer its permit to a third party who

would assume responsibility for operating the facility and treating any lingering discharges from the American Tunnel.

ii. Besides installing the bulkheads, Sunnyside Gold was required to remediate an “A” list of legacy mining and milling sites in the area. Sunnyside Gold would remove sources of zinc and iron loading at these sites in an amount roughly equal to what was discharging from the American Tunnel before treatment. Sunnyside Gold had to monitor dissolved zinc concentrations at a station known as A-72 on the Animas River about 1.6 miles downstream from Silverton, in an attempt to ensure that the water quality of the watershed would be protected. If water quality did not improve, Sunnyside Gold would commence additional mitigation projects on a “B” list. Ultimately, Sunnyside had to demonstrate to WQCD that zinc levels would remain below a baseline for five consecutive years.

iii. While carrying out the off-site mitigation projects, Sunnyside Gold would divert the main stem of Cement Creek to the treatment facility. After completing all the mitigation projects on the “A” list, Sunnyside Gold could reduce or eliminate the treatment of Cement Creek.

37. The consent decree also contained a financial surety provision. Within 30 days after entry of the decree, Sunnyside Gold was required to provide a financial surety for \$5,000,000 in the form of an irrevocable letter of credit. WQCD could draw on the letter of credit if Sunnyside Gold filed for bankruptcy and discontinued treatment necessary to maintain water quality in the Animas River. In that event, WQCD could enter and operate the treatment facility itself and dispose of treatment residues at Sunnyside Gold’s tailings pond.

38. WQCD agreed to terminate Sunnyside Gold’s discharge permit for the American Tunnel if all these criteria were achieved:

- Five years elapsed from the date of the valve closure at the first American Tunnel bulkhead.
- Two years elapsed since Sunnyside gave WQCD notice that the mine pool had reached equilibrium.
- Valves and pipes in the seals in the American and Terry Tunnels had been grouted.
- Hydrological controls and seals eliminating flows from the lower American Tunnel had been completed, or another party or parties had accepted the permit for water treatment at the American Tunnel.

- All of the “A” list mitigation projects were completed.
- Treatment of Cement Creek had ended.
- Sunnyside Gold demonstrated that water quality at the A-72 reference point could be maintained without the need for active treatment.

39. In the summer of 1996, Sunnyside Gold started work on the “A” list mitigation projects. By September, it had installed first bulkhead in the American Tunnel and closed the valve. Sunnyside Gold diverted the stream flow of Cement Creek into the treatment facility and began monitoring zinc levels at A-72. It also injected an alkaline solution into the mine pool to reduce its acidity.

40. In 1999, Sunnyside Gold told WQCD that the mine pool behind the American Tunnel bulkhead had reached physical equilibrium. However, by this time, the pool within the Sunnyside Mine was filling Bonita Peak and flooding into adjacent mine works, including the Mogul Mine. Sunnyside Gold knew that the mine pool was not stable: millions of gallons of water were filling miles of workings and forming acid mine drainage.

41. In May 2001, Sunnyside Gold took a final sample of the water behind the bulkhead and then installed more bulkheads downstream in the American Tunnel. By the end of August 2001, Sunnyside Gold installed a second bulkhead and closed its valve. By this point, the acidic drainage from the Sunnyside Mine had already made its way to the Mogul Mine. Moreover, the water quality at A-72 did not improve, so Sunnyside Gold undertook more mitigation projects at the “B” list sites.

42. In 2003, WQCD and Sunnyside Gold notified the Colorado court overseeing the consent decree that Sunnyside Gold had purportedly satisfied all of the consent decree’s conditions. Meanwhile, Sunnyside Gold was quietly settling litigation alleging that the Sunnyside Mine was flooding the Mogul Mine.

43. Based on Sunnyside Gold's representations, the court terminated the consent decree. The termination of the consent decree released Sunnyside Gold from its discharge permit for the American Tunnel and from the \$5,000,000 financial surety.

44. Water quality in the Animas River was improving when the treatment facility at Gladstone was in operation. But, as we explain below, the treatment facility shut down in 2005 and water quality in the Animas River dropped dramatically. Fish population surveys conducted by Colorado Parks and Wildlife observed sharp declines in trout and other species for many miles below the confluence of Cement Creek and the Animas. Sunnyside Gold and the regulators witnessed the decline in water quality and aquatic life in the Animas for more than a decade, but did nothing to alert downstream communities in New Mexico that pollutants from the Sunnyside Mine pool were flowing into their waters.

*Kinross Acquires Sunnyside Gold and Strands its Lingering Environmental Liabilities*

45. In June 2002, Kinross, Echo Bay, and TVX Gold Inc. entered into a "combination agreement" under the Canada Business Corporations Act. This agreement, effective January 31, 2003, consolidated ownership of the businesses. Through this merger, Kinross acquired all of Echo Bay's subsidiaries (*e.g.*, Sunnyside Gold) and its assets (*e.g.*, the Sunnyside Mine).

46. On March 21, 2003, Kinross Gold U.S.A., Inc. filed an Application for Authority to Transact Business in Colorado. In its application, Kinross Gold U.S.A. stated that it began transacting business in Colorado on January 31, 2003. Kinross Gold U.S.A. was and continues to be a wholly-owned subsidiary of Kinross.

47. Despite its incorporation in Nevada and its business activities in Colorado, both directors and all five officers of Kinross Gold U.S.A. had a listed address at 52<sup>nd</sup> Floor, 40 King Street West, Scotia Plaza, Toronto, Ontario, M5H 3Y2 Canada, which was the address of Kinross' corporate headquarters at that time. Upon information and belief, all of the directors



and officers of Kinross Gold U.S.A. are Kinross employees and received direction from Kinross. Upon further information and belief, Kinross Gold U.S.A. acted as the agent or alter ego of Kinross.<sup>3</sup>

48. Kinross owned 100 percent of Sunnyside Gold's shares. Since January 31, 2003, Kinross, directly and by and through its agents and alter egos, has controlled and directed its agent and alter-ego Sunnyside Gold's activities in Colorado, including but not limited to all of Sunnyside Gold's activities affecting the Sunnyside Mine. Upon information and belief, Sunnyside Gold could not meet its financial obligations without capital contributions or direct payments of creditors by Kinross.

49. On multiple occasions, Kinross directly contracted for and provided financial assurance and support for the benefit of its subsidiaries' activities in Colorado concerning the Sunnyside Mine. On May 1, 2003, Kinross provided a \$1,250,000 irrevocable letter of credit for the benefit of the Colorado Division of Minerals and Geology related to the Sunnyside Mine through Kinross's bank, The Bank of Nova Scotia. This financial assurance supported Sunnyside Gold's plans to reclaim lands around the American Tunnel, but it was patently insufficient to cover the costs of a catastrophic release from the Sunnyside Mine or other hydraulically connected mine workings.

50. Kinross swiftly reduced the amount of financial assurance provided for the Sunnyside Mine. In 2004, Kinross, by and through its agent and alter ego Kinross Gold U.S.A., reduced the amount of the surety to \$500,000 and directed The Bank of Nova Scotia to revise the irrevocable letter of credit to reflect that amount. Ultimately, Kinross eliminated the surety,

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<sup>3</sup> Kinross files consolidated financial reports and annual reports. In those reports, Kinross states that the use of the term "Kinross" throughout includes all of its subsidiaries. Unless otherwise specified, this Complaint uses "Kinross" when referring to Kinross Gold Corporation and its subsidiaries, including Kinross Gold U.S.A., and Sunnyside Gold Corp.

leaving no financial assurance in place to cover the costs of remediating new discharges from surrounding mine portals or to prevent a blowout of water from the Sunnyside mine pool. To wit, Kinross stranded the lingering environmental liabilities of its mining properties in Colorado. Sunnyside Gold's lack of independent capital and revenue, combined with Kinross's exit strategy from the Upper Animas Mining District, left the Sunnyside Mine financially abandoned.

51. Kinross directed and controlled Sunnyside Gold's remediation activities near Silverton. As further alleged in this Complaint, shortly after acquiring Sunnyside Gold, Kinross transferred ownership and operational responsibility for the treatment facility to Gold King Mines Corp. and its President, Mr. Stephen Fearn, an inexperienced operator who quickly proved incapable of managing the facility. Kinross knew or should have known that divesting itself and its subsidiaries from the treatment facility and transferring operations to Mr. Fearn would impair the water quality of the Animas River, injure the riverine ecosystem, and imperil the health and livelihood of downstream communities in Colorado and New Mexico.

52. Kinross also knew or should have known that the plan to bulkhead the Sunnyside Mine and allow acid mine drainage from the Sunnyside Mine to build within Bonita Peak had created a real and substantial danger of a future blowout. Given Kinross' international presence, and the many instances of past mine adit plug and bulkhead failures in Colorado and elsewhere, Kinross either knew or should have known that the decision to plug the American Tunnel was far from fail-safe. Indeed, increased discharges of acid mine waste water from other hydraulically connected mine portals, including the Mogul Mine and the Gold King Mine, were evident as early as 2001—a clear sign that the plan was failing. Rather than confront the issue, however, Kinross publically denied any connection between the Sunnyside mine pool and increased discharges from other mines. Kinross also denied that plugging the American Tunnel could

cause hydraulic pressure within Gold King Mine Level 7 portal to increase—the root cause of the catastrophic release on August 5, 2015.

*Discharges from Gold King Mine and Neighboring Mines Increase and the Wastewater Treatment Facility Is Shut Down (1999 to 2005)*

53. Before Sunnyside Gold plugged the Sunnyside Mine, the Gold King Mine was virtually dry. In 1996, the Division of Minerals and Geology inspected the Gold King and found that it drained just one or two gallons of acidic, metal-laden water per minute—a mere trickle. Conditions changed significantly soon after Sunnyside Gold installed the first bulkhead in the American Tunnel. In late 1999, Colorado officials received reports of new discharges from the Gold King, and increased discharges from the neighboring Mogul Mine. Between 1999 and 2001, the discharge rate from the Mogul Mine increased from roughly 30 to 165 gallons per minute; between 1999 and 2005, the Gold King Mine’s discharge rate rose from seven to 40 gallons per minute. As a result, officials declared that the Gold King and Mogul had become two of the worst polluting mines in Colorado.

54. In 2000, Steven Fearn, the President of Gold King Mines Corp. bought the Gold King Mine from the trustee for Pitchfork “M” Corporation. In May 2001, WQCD issued a discharge permit to Gold King Mines Corp. for the Level 7 portal. In a 2002 letter to the state, Mr. Fearn noted that discharges from the Level 7 portal had increased to about 60 gallons per minute, corresponding to the installation of a second bulkhead in the American Tunnel.

55. When the discharges from the Mogul Mine surged after the sealing of the American Tunnel, its owner, Mr. Todd Hennis, sued Sunnyside Gold in 2002. Mr. Hennis alleged that water from the Sunnyside Mine pool had found a pathway into the Mogul Mine workings and was trespassing on his property. Mr. Hennis ultimately dropped the lawsuit, and was included in a byzantine agreement with Mr. Fearn and Sunnyside Gold. The heart of the

agreement was the transfer of Sunnyside Gold's water treatment plant and its permit to Mr. Fearn. Mr. Hennis received title to most of the land at Gladstone, which contained buildings, equipment, and settling ponds associated with the treatment facility. Sunnyside Gold also agreed to bulkhead the Mogul and the neighboring Koehler Mine as part of the deal.

56. By agreeing to bulkhead the Mogul Mine, Sunnyside Gold seemed to recognize a pathway that allowed water to migrate from the Sunnyside mine pool into the Mogul's workings. In fact, a consultant hired by Sunnyside Gold a decade earlier had analyzed possible consequences of plugging the American Tunnel. The consultant predicted that within months of installing the bulkhead in the American Tunnel, water from the mine pool could travel through the "Brenneman Vein"—a direct path between the Sunnyside and Mogul—at a rate of 160 gallons each minute. That analysis was remarkably prescient: discharges out of the Mogul Mine increased from 35 to 65 gallons per minute in 1995 to 165 gallons per minute six years later.

57. In autumn 2002, Gold King Mines Corp. and Mr. Fearn purchased the Mogul Mine from San Juan Corporation ("San Juan Corp.") and its President, Mr. Hennis, for a note. As additional surety to secure the note, Gold King Mines Corp. gave San Juan Corp. a second mortgage on the Anglo Saxon and Harrison Mill Site claims, which included the water treatment facilities and settling ponds respectively at Gladstone. San Juan Corp. also leased another property, the Herbert Placer, to Gold King Mines Corporation, which contained settling ponds that Mr. Fearn intended to use for water treatment.

58. In January 2003, with full knowledge of the rising water level in Bonita Peak, Sunnyside Gold formally transferred ownership of its treatment facility and its discharge permit for the American Tunnel to Gold King Mines Corp. As a result, Mr. Fearn became the operator responsible for the facility. WQCD required Mr. Fearn to obtain certification to operate the

facility by June 30, 2004. Until that time, Larry Perino, Sunnyside Gold's manager of reclamation activities at the Sunnyside Mine, was supposed to supervise Mr. Fearn. Notably, Mr. Fearn never obtained certification.

59. Less than a year into the lease, the relationship between Mr. Hennis and Mr. Fearn broke down. In the fall of 2003, Mr. Hennis sought to evict Mr. Fearn from the Herbert Placer for failing to maintain adequate liability insurance and neglecting to remove sludge from the settling ponds. Eventually, Mr. Hennis and Mr. Fearn reached a compromise giving Mr. Fearn more time to remove the sludge and devise an alternative method to treat mine drainage.

60. Over the next year, Gold King Mines Corp. and Mr. Fearn suffered a series of setbacks, culminating in the closure of the treatment facility. First, in March 2004, one of the surety bonds covering the Gold King Mine was canceled. The Division of Minerals and Geology ordered Mr. Fearn to replace the canceled bond, though he never did. Then, in September, WQCD issued a notice of violation to Gold King Mines Corp. for exceeding the Gold King Mine Level 7 portal's permitted discharge limits for zinc, copper, and pH. Finally, in October, Mr. Hennis returned to court, again complaining that Mr. Fearn was in breach of the lease.

61. The court ruled in favor of San Juan Corp. and Mr. Hennis, and ordered Mr. Fearn to cease discharging wastewater into the Herbert Placer settling ponds and to remove residual sludge. Now evicted, and without a way to treat the acidic discharges from the American Tunnel and the Gold King Level 7 portal, Mr. Fearn diverted the untreated discharges into Cement Creek and, ultimately, the Animas River.

62. Gold King Mines Corp. filed for bankruptcy the next year. Colorado's Mined Land Reclamation Board ordered the forfeiture of Gold King Mines Corp.'s reclamation bonds for the Gold King Mine. As the second mortgage holder, San Juan Corp. and Mr. Hennis



acquired the Gold King Mine through a foreclosure action. They have owned the Gold King ever since.

*Reclamation of the Gold King Mine (2005 to 2011)*

63. Acid mine drainage from the Gold King Mine Level 7 adit continued to grow after San Juan Corp. and Mr. Hennis acquired the Gold King Mine. The adit had collapsed during the winter of 2004, which accelerated the drainage and saturated part of the waste rock dump in front of the adit. By 2007, the discharges had surged to between 150 to 200 gallons per minute, based on the season. In response, DRMS prepared to re-direct the discharges away from the slope of the waste rock dump and re-rout the water into Cement Creek.

64. When DRMS notified Mr. Hennis of the situation and its plan, Mr. Hennis installed a lined channel on top of the waste rock dump to redirect the mine drainage from the Gold King into Cement Creek. Later, on August 28, 2007, Mr. Hennis met with DRMS officials and an EPA official named Steve Way to discuss his own plan to address the Level 7 adit discharges.

65. At the 2007 meeting, Mr. Hennis voiced his concerns about a potential blowout of the portal at Level 7. In fact, Mr. Hennis requested EPA's help in entering the mine to investigate potential blockages of the portal that could cause a hazardous blowout. Public documents show that Mr. Hennis told EPA that the investigation would confirm that the Sunnyside mine pool was the source of the Gold King's discharges.

66. In public interviews, Mr. Hennis repeatedly stated that he presented water quality data to EPA, Colorado, Kinross, and Sunnyside Gold, which demonstrated that water from the Sunnyside mine pool had flooded the Gold King Mine. On information and belief, representatives and employees of Kinross, Kinross Gold U.S.A., and Sunnyside Gold were told many times over many years to re-open the bulkheads in the American Tunnel, lower the mine

pool to prevent further flooding of the Gold King Mine and neighboring mines, and restore the water table within Bonita Peak to the level that existed before the plugging of the American Tunnel.

67. In 2008, DRMS started partial reclamation work at the Gold King Mine site using Gold King Mine Corp.'s forfeited reclamation bonds. That year, DRMS secured all four portals and installed a grated closure at the Level 7 adit to facilitate drainage. DRMS also redirected the flow into a "diversion structure"—essentially a half pipe set into a graded ditch—that conveyed drainage away from the front portal and the waste rock dump. Notably, in DRMS's project summary describing these actions, DRMS admits that it closed the Level 7 adit in a way that increased the potential for a blowout.

68. In September 2009, DRMS returned to the Gold King Mine site and backfilled the Level 7 adit. DRMS planned to install a drainage pipe (24-inch diameter, 30 feet long) at the floor of the adit to drain the mine and prevent an increase in hydraulic pressure. DRMS's plans emphasized that the pipe should be set at a slight slope to the outside to facilitate drainage.

69. When DRMS started work, its employees observed a collapse about 30 feet inside the adit. To view the collapse and monitor the unstable conditions, DRMS decided to insert an observation pipe (30-inch diameter, 20 feet long) about 12 inches above the top of the drainage pipe. When DRMS began inserting the pipes and backfilling around them, timbers that supported the portal collapsed and loose material completely covered the observation and drainage pipes.

70. DRMS was concerned that this collapse would raise the water pressure within the Gold King Mine workings, making a blowout even more likely than before. To relieve this

concern, DRMS drove a steel pipe “stinger” through the drainage pipe and into the collapsed material. The stinger was six inches in diameter and 44 feet long.

71. DRMS records are unclear about precisely how far the stinger extended into the mine. A contemporaneous DRMS record said the stinger extended 14 feet past the end of the 30-foot drainage pipe, while the 2009 DRMS project summary said it penetrated at least some of the 12 feet of collapsed material. The 2009 DRMS project summary also observed that the stinger “was unable to penetrate through any of the original collapse in the tunnel” and stated that the adit continued to drain about 200 gallons per minute, similar to the rate before DRMS backfilled the adit and installed the two pipes and stinger.

72. Besides backfilling the adit, DRMS constructed a concrete channel and installed a flume on the surface of the waste dump. The flume and channel were located in front of the adit and connected to the drainage ditch that DRMS had installed in 2008.

*EPA’s Activities at the Red and Bonita Mine (2011 to 2015)*

73. In 2010, EPA began to investigate the Red and Bonita Mine, where debris covered a collapsed historical adit. Since 2009, acid mine drainage had been discharging through the debris and entering Cement Creek at rates from 181 to 336 gallons per minute, apparently also impacted by the Sunnyside mine pool.

74. Steve Way was EPA’s On Scene Coordinator (“OSC”) during the investigations and assessments at the Red and Bonita Mine.

75. During its investigation, EPA removed debris blocking the Red and Bonita adit and built a temporary portal. EPA intended to capture the discharge in a treatment pond below the mine’s waste rock dump. Before proceeding, however, EPA asked Department of Interior Bureau of Reclamation (“BOR”) to review its plan to open the mine. BOR warned EPA that a blowout could occur if EPA tried to remove the blockage under its proposed plan. BOR also told

EPA to review maps of the mine workings and reconsider its plan under the assumption that the mine was full of water. BOR also asked EPA how it would respond to a sudden release of that much water (*i.e.*, potentially millions of gallons). After this discussion, EPA apparently understood these risks and changed its approach. EPA's contractors drilled a well about 30 feet upslope from the mine opening to determine the volume and pressure of water inside the mine.

*EPA's Activities at the Gold King Mine in 2014*

76. EPA first obtained access to the Gold King Mine in 2008 through an agreement with San Juan Corp. and Mr. Hennis. The agreement allowed EPA, the U.S. Bureau of Land Management ("BLM"), and DRMS to enter the Gold King and Mogul Mine sites and other properties owned by San Juan Corp. and Mr. Hennis.

77. When EPA sought to renew the agreement in late 2010, Mr. Hennis refused to grant EPA access to the mine and surrounding properties based on his stated concerns that EPA would create a "pollution disaster." When EPA served Mr. Hennis with a compliance order and threatened fines upwards of \$35,000 per day, Mr. Hennis signed the renewed agreement. They renewed the access agreement several more times, including a renewal on August 8, 2014, which lasted through the end of 2015.

78. In 2014, DRMS asked EPA to re-open the Gold King Mine Level 7 adit and investigate the drainage situation. Because of the proximity of the Red and Bonita to the Gold King (about 500 feet), EPA and DRMS decided to assess the conditions at the Gold King Mine to determine if there would be any impacts (*i.e.*, increased adit flow) before DRMS and EPA shut the valve on the Red and Bonita bulkhead.

79. EPA requested a work plan for the Gold King Mine investigation from Environmental Restoration and issued a "Task Order Statement of Work" ("Statement of Work")

on June 25, 2014. The Statement of Work outlined a plan for the investigation and described precautionary measures to prevent a blowout of impounded water from the adit. Section 2.0 of the Statement of Work, titled “Description of Work” stated:

- The blockage in the adit *must* be removed in a manner to prevent a surge of impounded mine water from being released. Specifically, water impounded behind the blockage *must* be drawn down in a controlled manner as the blockage is removed. In addition, the flow from the adit *must* be directed into the existing channel or other conveyance provided by [Environmental Restoration]. (emphasis added)
- “[Environmental Restoration] will conduct operations in management of surface and underground work activities to include construction & maintenance of repository, retention pond & water treatment, access road maintenance....”
- “The work will be conducted by qualified contractors with the assistance and cooperation of the landowner, San Juan Corp. In addition to compliance with applicable OSHA standards, the work is to be conducted in compliance with appropriate Mine Safety and Health Administration (MSHA) regulations inclusive of establishing a safe underground working environment for personnel and the rehabilitation of underground workings and escape ways. (Note: MSHA regulations are not applicable to inactive mines; however, certain standards are relevant to the propose[d] work.) All work will be performed under the conditions as described in an approved Work Plan to be submitted to the OSC for approval that will be prepared by the Contractor and submitted to the Agency before mine rehabilitation work begins.”
- “Personnel on site will follow all pertaining [Applicable or Relevant and Appropriate Requirements] in reference to MSHA and OSHA in performing work on this site.”

The Statement of Work also made clear that those conducting the work were required to follow best management practices and engineering specifications.

80. After receiving EPA’s Statement of Work, Environmental Restoration issued a Request for Proposal (“RFP”), dated July 29, 2014, and solicited bids from sub-contractors. The RFP states that EPA tasked Environmental Restoration with “procur[ing] and manag[ing] the reopening and ground support construction at the Upper Gold King Mine – 7 level adit.” The RFP also describes the scope of the proposed work in technical detail: Environmental Restoration would select a subcontractor to “mobilize all labor, material, equipment, and



supplies necessary to perform as directed by” Environmental Restoration and EPA. Environmental Restoration would then “conduct operations in oversight management of surface and underground work activities.”

81. The RFP also makes clear that the work was required to “meet all requirements of the State of Colorado as to design and construction laws,” and its workers were required to “fully investigate[] and comply with the need/potential need for a Professional Engineer’s review and stamp for project plans.” The RFP also said, “personnel and equipment *shall* comply with all safety requirements set forth in applicable State, Federal and local laws and regulations including the requirements in MSHA and OSHA. The Subcontractor *shall* ensure that its employees perform the work in a safe manner....” (emphasis added).

82. EPA began work at the Gold King Mine in September 2014 under the direction of OSC Steven Way, who had met with Mr. Hennis and DRMS six years earlier when Mr. Hennis warned that plugging the American Tunnel had flooded the Gold King and surrounding mines.

83. On September 11, 2014, EPA’s sub-contractor, Harrison Western, started excavating and removing the metal grating and portions of the two pipes that DRMS had installed in 2009 at the Level 7 adit. After just two hours of excavation on the blockage, the crew abruptly stopped work. EPA OSC Steve Way, Colorado DRMS officials, and employees of Environmental Restoration, Weston Solutions, and Harrison Western inspected the Level 7 adit and determined that the drainage would require larger settling ponds and additional treatment. EPA postponed the remaining work until 2015.

84. After EPA abruptly halted work at the Gold King Mine, Mr. Way told two Weston employees named Jan Christner and Jeff Bryniarski to prepare a pollution report on the

Gold King Mine operation. Mr. Way also instructed them to include information about the discharge from the Level 7 adit, using DRMS's records and documents as a reference.

85. Mr. Way submitted the report to his EPA Region 8 superiors on or about September 26, 2014. In the final report, Way explained and documented the EPA crew's conclusions about the location of the pipes installed by DRMS and the elevation of the adit floor – specifically, that the pipes were adjacent to the adit roof. Inexplicably, those conclusions directly conflicted with DRMS records available at the time. DRMS's records of its 2009 reclamation work indicate that the drainage pipe was installed on the *floor* of the adit at a slight slope to encourage drainage from the mine. Further, the observation pipe was installed just above the drainage pipe.

86. In the report to Region 8, however, Mr. Way wrote that shortly after excavation began, “the work on [the] blockage was stopped when it was determined the elevation of the adit floor was estimated to be 6 feet below the waste-dump surface elevation.” EPA apparently assumed that the floor was six feet below the level of the waste dump surface because it concluded—contrary to DRMS's own records—that DRMS had installed the two drainage pipes immediately *below* the roof of the adit. When EPA was at the site in 2014, the two pipes were stacked on top of each other (together about 48 inches tall) and the bottom of the lower pipe was nearly level with the waste rock dump. Because the original height of the adit was 10 feet, EPA concluded that the adit floor was actually 6 feet beneath the surface of the waste dump.

87. EPA compounded this error by failing to test and confirm the amount of water behind the adit by using a drill rig to bore into the mine from above and inserting a stinger pipe, just as it had done at the Red and Bonita Mine in 2011. As further explained below, MSHA regulations require operators to drill bore holes before excavating in areas adjacent to flooded

mine workings. Had EPA followed this common practice—and its own precedent—it would have discovered that the Level 7 adit contained a vast quantity of highly pressurized water. A hydraulic pressure test would have left no doubt that it was unsafe to remove the backfill and that EPA needed to take additional precautions to prevent an “excavation-induced failure.”

88. On information and belief, before EPA left the site that year, the construction crew pushed large quantities of earthen material and debris in front of the DRMS-installed pipes, forming an earthen plug that prevented the mine from draining and caused a head of water to further build up behind the blockage.

*The Last Events Before the Blowout of the Gold King Mine*

89. In March 2015, Mr. Way discussed the planned Red and Bonita and Gold King operations with Weston Solutions employees. On March 23, Mr. Way sent an email to Mr. David Robinson, Weston Solution’s Senior Project Manager and Safety Officer, and told him to “[p]repare water treatment plans for managing water impounded behind the adit portal” and to “[d]ocument activities during the portal opening and construction.”

90. In May 2015, Environmental Restoration submitted a draft work plan for the Gold King Mine operation, which included sub-contracting with Harrison Western to complete the project. On June 11, Environmental Restoration emailed Mr. Way a second draft work plan for Mr. Way to review and approve. On information and belief, the June 11 work plan was the last version created before the August 5 blowout, and neither Mr. Way nor any EPA official formally approved the June 11 work plan before the August 5 blowout.

91. In or around June and July 2015, EPA, Environmental Restoration, Weston Solutions, and Harrison Western visited the Gold King Mine several times to assess site conditions and drainage flows. They collected water samples and measured the flow from the

adit. They also discussed a plan to install a sump basin to treat water that would be pumped out of the mine during the adit excavation work.

92. To prepare for the adit excavation, EPA and its contractors graded the surface of the waste dump, and started constructing a water management and treatment system to handle an anticipated increase in discharges from the mine. During three months of site preparation, however, EPA and its contractors never attempted to test the hydrostatic pressure behind the blocked portal, or take any steps beyond visual observations to determine the volume of water inside the adit.

93. According to BOR's technical evaluation of the blowout, Mr. Way called a BOR engineer named Michael J. Gobla "[o]n or about July 23" to discuss the situation at the Gold King Mine site. Mr. Way was about to leave for vacation and would return to the site on August 14. During the conversation, Mr. Way asked Mr. Gobla to visit the site and evaluate EPA's excavation plans. Because Mr. Way was "'unsure about the plans for the Gold King Mine and wanted an outside independent review of the [] plans by BOR," they agreed that Mr. Gobla would conduct an on-site review of the plans on August 14—after Mr. Way returned.

94. Sometime in late July or early August, Mr. Way left for vacation. Mr. Way arranged for a DRMS official named Kristen Brown to supervise activities at the Gold King Mine during the week of July 27. Mr. Way asked another EPA employee, Mr. Hays Griswold, to supervise the site from August 3 until Mr. Way returned from vacation.

95. On July 29, 2015, Mr. Way emailed specific instructions about the scope and timing of work at the Gold King Mine site to Matt Francis (Environmental Restoration), Elliot Petri (Weston Solutions), and Allen Sorenson (DRMS). Later that day, Mr. Way forwarded these instructions to Mr. Griswold. Mr. Way's instructions set out the "priority and strategy" for

on-site work during the week of August 3. Mr. Way directed Environmental Restoration to provide “adit drainage control” and implement a “water management system” *before* the on-site crew would begin digging out the earthen debris that blocked the adit. To that end, Mr. Way told the crew to “set up the pipe and filter bags towards the outlet end of the discharge pipe/[waste rock] dump.” He also specified “[b]efore any excavation towards the adit floor between the concrete flume channel and adit, the sump, and sump-pump set up to handle adit discharge must be in place.” Furthermore, he told the crew that “the piping / hose must be in place to allow flow to be directed to the [Red and Bonita treatment pond] before removing any adit blockage at or below 24” pipe in the adit debris. And, the stinger steel pipe, 4” threaded well casing pipe, must be prepared and available.” Finally, Mr. Way made it clear that “[a]dit face excavation... will occur only when either the OSC or DRMS (Allen [Sorensen]) or [Harrison Western] mine crew Superintendent and the ERRS RM [Matt Francis] are present. In addition the ability to treat water must be set up with START [Weston Solutions] present.”

96. On August 4, at about 8:45 am, Mr. Griswold arrived at the site. An unknown DRMS employee arrived an hour later.<sup>4</sup> With an incomplete safety plan, an inadequate evaluation of the fluid hazard, and lacking any equipment to prevent or mitigate an uncontrolled release of water from the mine, the EPA crew began burrowing into the adit with a backhoe around 10:30 a.m. By the end of the day, the crew had dug out all but a small portion of the drainage pipe that DRMS installed in 2009. Contemporaneous photographs of the excavated adit

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<sup>4</sup> Neither EPA nor DRMS has revealed the name of the DRMS employee who visited the site on August 4. Based on documents produced by EPA pursuant to New Mexico’s Freedom of Information Act request, New Mexico believes that the DRMS individuals present at the site on August 4 and 5 were Bruce Stover and Allen Sorensen.



show what appears to be wooden debris from the portal structure embedded in the earthen plug that held back the water within the mine.<sup>5</sup>

97. Photographs of EPA's work at the Gold King Mine site on August 4 and 5 reveal that the crew substantially deviated from Mr. Way's written instructions, as well as the June 11 work plan. These photographs confirm that the crew was excavating at the level of the drainage pipes, toward the adit floor, without a pump, hose, stinger, or sump and sump-pump in place. In short, the crew was digging deep into the face of the adit, at the level of the impounded water, without equipment necessary to control the anticipated release of highly pressurized acid mine drainage.

98. The following day, August 5, 2015, more personnel from DRMS joined the EPA crew at the Level 7 adit to continue excavating. That morning, the EPA crew dug out and removed the last remnants of the DRMS-installed pipes. Because, at this point, the pipes were visibly well below the plug, the EPA crew knew or should have known they were removing material at least several feet below the roof of the adit.

99. Soon after the EPA crew resumed digging into the adit, the backhoe operator reported hitting a "spring." Inexplicably, the crew did not attempt to backfill the adit or plug the "spring." Further illustrating the poor preparation on the part of the crew, a video recording, taken just moments after the blowout, shows an on-scene worker asking, "What do we do now?"

*Federal "Investigations" of the Blowout Have Been Rife with Conflict and Shortcomings*

100. On August 5, 2015, EPA, Environmental Restoration, Weston Solutions, Harrison Western, DRMS, and all other parties on site were not prepared to respond to an uncontrolled

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<sup>5</sup> This "plug" (*i.e.*, blockage) was a combination of collapsed debris within the mine, backfill placed by dumping from the bucket of an excavator, and material from the surficial slope failure at the mine portal.

release of acidic mine water from the Gold King Level 7 adit, even though they were aware of this risk for more than a year.

101. Just days after the spill, Mr. Griswold told the Denver Post in an interview that “[n]obody expected (the acid water backed up in the mine) to be that high.” Months later, Mr. Griswold contradicted this statement. In an email sent to other EPA officials on October 28, Mr. Griswold wrote he personally knew the blockage “could be holding back a lot of water and I believe the others in the group knew as well.”

102. On August 24, 2015, EPA released a summary of its “internal investigation” of the August 5 blowout. EPA acknowledged that the July 2014 RFP and June 11 work plan identified the potential for pressurized mine water conditions and prescribed specific measures to control drainage during blockage removal, which the parties on site did not follow. EPA admitted that the work plan did not include emergency procedures or contingency plans to protect public health and the environment from a catastrophic blowout. EPA also said it “was not able to identify any calculations made on the possible volume of water that could be held behind the portal plug.”

103. On December 8, 2015, EPA issued an “addendum” to its internal investigation, which contained contradictory and misleading information about the on-site crew’s actions at the Gold King Mine. For example, EPA’s addendum included an undated drawing, titled “Attachment D.” EPA’s use of this drawing in the addendum leads the reader to believe that EPA and the crew used it as a guide during on-site operations. However, Weston Solutions employee Elliot Petri later told congressional investigators that the undated drawing was actually created 6 days after the release, on August 11.

104. On October 22, 2015, the BOR released a “Technical Evaluation of the Gold King Mine Incident.” Despite repeated assurances from EPA Administrator Gina McCarthy that the BOR’s report would help identify those responsible for the blowout, the BOR’s report made no findings of fault or wrongdoing on the part of EPA or any other party. In fact, the report expressly disavowed any obligation to determine wrongdoing. On information and belief, the BOR was ordered to “stay clear” of addressing EPA and the crew’s negligence and responsibility for the blowout.

105. Even though BOR avoided determining who was at fault, its report confirmed that the Gold King Mine blowout was the result of multiple grossly negligent and reckless actions and omissions, including the lack of:

- An understanding that water impounded behind a blocked mine opening can cause hydraulic forces similar to those in a dam;
- Analysis of potential failure modes;
- Analysis of downstream consequences if a failure were to occur;
- Analysis of the geologic and hydrologic conditions of the general area;
- Monitoring to ensure that the structure constructed to close the mine portal continues to perform as intended; and
- An understanding of how the groundwater system can affect mines in the area and how work at one mine can affect conditions at another mine.

106. A U.S. Army Corps of Engineer peer reviewer expressed “serious reservations” about the actual cause of the blowout. In fact, the peer reviewer refused to provide his signature unless the BOR report expressly included his reservations. The peer reviewer found that the “actual cause of failure was some combination of issues related to EPA internal communications,

administrative authorities, and/or a break in the decision path. The report... did not describe why a change in EPA field coordinators caused the urgency to start digging out the plug rather than wait for BOR technical input as prescribed the EPA project leader.” In other words, the peer reviewer believed that the blowout was the result of the negligent implementation and deviation from the work plan and Mr. Way’s instructions.

107. The federal government’s investigations over the past year have failed to explain the critical decisions and actions that caused the Gold King Mine release. Despite EPA’s repeated admissions of responsibility, EPA has not been forthcoming with information about the circumstances leading to the spill and its documentation of those efforts. EPA has also ignored congressional requests and subpoenas for documents and information.

108. Congressional hearings in the fall of 2015 noted that EPA turned over documents with substantial redactions, making it impossible to determine which individuals and entities were responsible for preparing parts of the Gold King Mine work plan and which individuals and entities were actually present at the Gold King Mine site on August 5. In addition, a video from the Gold King Mine on the day of the spill was edited to remove the statements of an on-scene worker moments after the blowout.

109. On August 12, 2015, the House Oversight and Government Reform Committee requested that the EPA Office of Inspector General (OIG) investigate the Gold King Mine blowout. Shortly after that request, the OIG announced it would open an investigation into EPA’s role in the spill. In June 2016, the OIG informed the Committee that a criminal inquiry into the blowout had been opened.

110. On October 11, 2016, the OIG held a conference call with congressional staff to discuss the status of this investigation. During the call, the OIG stated that it had found evidence

of criminal wrongdoing by an unnamed EPA official, including providing false statements in a criminal investigation and violations of the Clean Water Act. The OIG also told congressional staff participants that it had referred these criminal findings to the United States Attorney for the District of Colorado. On the same day, however, the U.S. Attorney declined to prosecute these charges.

111. On information and belief, the work conducted by EPA, DRMS, Environmental Restoration, Weston Solutions, and Harrison Western in connection with the Gold King Mine amounted to reckless, careless, and grossly negligent conduct that was not driven or supported by social, economic, or public policy considerations. Furthermore, their actions substantially deviated from their own work plans, the mandatory directions given by Mr. Way, established engineering standards of care, and applicable federal and state regulations.

*New Mexico's Environmental and Economic Injuries from the Gold King Mine Release*

112. After New Mexico received notice of the Gold King Mine release on August 6, NMED immediately contacted public water systems and recommended that they consider shutting off the intake of water along the Animas River until more information about the contamination was known. The next day, NMED contacted Arizona, Utah, and the Navajo Nation to coordinate and share information. On August 8, the plume of contamination passed the confluence of the Animas and San Juan Rivers. On August 10, New Mexico's Governor Susana Martinez, declared a state of emergency in New Mexico.

113. New Mexico incurred millions of dollars in immediate emergency response costs because of the Gold King Mine release. New Mexico's initial response and monitoring costs involved 14 different New Mexico state agencies, academic organizations, and communities. State and local emergency response staff, engineers, scientists, public servants, academics, and private citizens came together to monitor the plume of contamination as it meandered



downstream. Those response and monitoring activities included advance, crisis, and post-crisis water sampling and testing, sediment testing, agricultural ditch inventories and testing, public outreach, hundreds of private well tests, providing potable water, supporting drinking water systems, supplying showering stations, and offering monitoring equipment.

114. New Mexico will incur further costs in implementing a long-term monitoring plan and a run-off preparedness plan. These plans address the imminent and ongoing melting of the spring snowpack, which will increase surface water turbidity, re-suspend, and re-mobilize metals that were deposited throughout the Animas and San Juan Rivers, as demonstrated by recent sampling. For example, NMED recently took samples north of Durango, Colorado, where yellow discolored sediment was visible at residential properties along the Animas River. NMED received lab results of these samples on May 3, 2016, which EPA received on the same day. The sediment sample contained 3,100 ug/g (equal to 3,100 mg/kg or “parts per million”) of lead. This lead concentration far exceeds the risk level of 400 mg/kg developed by EPA for lead in residential soil—a level specifically calculated for non-carcinogenic effects in children. A lead concentration of 500 mg/kg has been used as a cleanup target for contaminated sediments at numerous Superfund sites in New Mexico and elsewhere. A 500 mg/kg target would be entirely appropriate for sediments affected by the Gold King Mine release, an event that – by EPA’s own estimation – discharged 880,000 pounds of metals into the Animas River.

115. New Mexico is especially concerned about the further migration of these metals from the Animas River, the continuing discharges of the Sunnyside mine pool, and the concomitant long-term impacts to New Mexico’s waterways. It is now clear that releases from those mines occurred before, during, and after the Gold King Mine blowout. Those releases will continue until a more comprehensive control strategy is implemented at the mining sites, and the

contamination in the sediments of the Animas and San Juan Rivers is fully addressed. New Mexico, its counties, and its local governments will continue to incur additional costs to monitor the residual effects of these pollutants for an indefinite future period.

116. New Mexico has also suffered enormous economic losses from reduced business activity and lost tax revenue as a direct and proximate result of the Gold King Mine release. Many businesses in northern New Mexico rely on the Animas and San Juan Rivers for recreational rafting and fishing services or irrigation, farming, and ranching activities. Because of the uncertainty and anxiety generated by widely-circulated images of a sickly yellow river, recreational and agricultural uses stopped or slowed to a crawl, while many anglers and tourists avoided visiting San Juan County altogether. The reduced economic activity and concomitant reduction in GDP caused by the spill have directly affected New Mexico's tax base. Simply put, the Gold King Mine release has already cost the State of New Mexico millions of dollars in taxes, fees, and other income from regional economic activities.

117. The discharged wastewater and sludge from the Gold King Mine was highly acidic and contained arsenic, lead, mercury, cadmium, copper, zinc, and other dangerous heavy metals. Many of these pollutants have now fallen out of the water column and settled in the sediments of the Animas and San Juan Rivers, as well as Lake Powell. These pollutants now pose imminent and substantial human health and environmental risks. Public health officials believe that large volumes of these heavy metals and contaminated sediments have formed hot spots in various "sinks" in the Animas River above and below New Mexico's border with Colorado. Similar depositional areas containing hot spots of heavy metals and contaminated metals likely exist throughout the Animas and San Juan Rivers and in Lake Powell. Public health officials have discovered heavy metal-laden sediment in affected irrigation ditches in New

Mexico, both immediately after the spill and in recent months. High flow events, storms, and the annual spring runoff will re-suspend and re-mobilize these contaminants, distribute them throughout the Animas and San Juan Rivers, and push them into Lake Powell for years to come.

118. Additionally, the Animas and San Juan Rivers have been stigmatized by the metals, acidic rock waste, and contamination from the Gold King Mine release. The indelible images of a mustard-hewed toxic plume meandering downstream – into the habitat of several endangered species and superb sport fishing and recreational grounds – will linger long after the visible impacts of the release have vanished. Stigma from the Gold King release will continue to reduce the economic benefits of New Mexico's natural resources until its lands and waterways are fully restored, and very likely beyond. The direct and tangible effects of this lingering stigma include lost economic activity and associated taxes, fees, and income because of reduced tourism, fishing, and land uses, including a significant reduction in agricultural and ranching activities in the Animas and San Juan River Valley in northwestern New Mexico.

119. Indeed, the local effects of the Gold King Mine release have continued over a year later, as many farmers, ranchers, residents, and consumers have lost trust in the health and integrity of the Animas and San Juan Rivers. Besides losing crops due to the shutdown of irrigation ditches for weeks after the release, farmers in the Animas and San Juan River Valley continue to suffer from markedly diminished revenues because consumers refuse to purchase produce grown in this region. The stigma attached to locally grown produce has forced many farmers to significantly reduce, and in some cases, abandon crop production altogether. Many ranchers, especially those who lost livestock following the release, refuse to use river water for their remaining herds. Rather, they have chosen to haul in water from miles away, which has significantly reduced their herds. What is more, property values along and near the Animas and

San Juan Rivers have dropped due to the stigmatic effects of the release. Concerns about long-term health risks of the release have caused many residents to abandon gardens, orchards, and other plant life on their properties. Residents reported observing that wildlife and livestock refused to drink from the rivers after the release. They have also reported that fishing and recreation in parts of the rivers affected by the release have all but ceased. And they have observed discolored sediment, continuing discoloration of the affected waters, and an increased mortality in aquatic life. Beyond the losses already suffered by New Mexico and its residents, the State estimates that the contamination and stigma from the Gold King Mine release will cause additional economic losses and damages for years to come, far surpassing those the State has already suffered.

*EPA Lists the “Bonita Peak Mining District” on the National Priorities List of Sites Eligible for the Superfund Cleanup Program*

120. On September 9, 2016, EPA designated a group of inactive and abandoned mining sites near the Animas River headwaters for the National Priorities List (“NPL”). As a result, these sites are eligible for cleanup financed under the federal Superfund program. The geographic scope of the “Bonita Peak Mining District” site is currently restricted to 46 mining sites and 2 additional study areas. All but one of these proposed sites are north of Silverton, Colorado. EPA’s site boundary entirely excludes the Animas River, which has been contaminated by the heavy metals, mine-dump runoff, and other hazardous substances deposited by the Gold King Mine release.

121. EPA has excluded downstream communities, including New Mexico, from participation in the Superfund process. EPA has provided no work plans, permitting information, or data on potential treatment systems to downstream scientists, regulators, stakeholder groups, or citizens for review. EPA is a responsible party for the Gold King Mine

release of August 5, 2015—an event that brought national scrutiny to abandoned mining sites in the Upper Animas River Basin. EPA cannot act as a regulator and supervisor of cleanup activities in the Bonita Peak Mining District while at the same time be a responsible party.

## **CLAIMS FOR RELIEF**

### **FIRST CAUSE OF ACTION: COST RECOVERY UNDER CERCLA 42 U.S.C. § 9607(a) AGAINST EPA, ENVIRONMENTAL RESTORATION, WESTON SOLUTIONS, HARRISON WESTERN, KINROSS, KINROSS GOLD U.S.A., AND SUNNYSIDE GOLD**

122. New Mexico incorporates the allegations in all preceding paragraphs.

123. EPA, Environmental Restoration, Weston Solutions, Harrison Western, Kinross, Kinross Gold U.S.A., and Sunnyside Gold are “persons” under CERCLA. 42 U.S.C. § 9601(22).

124. The Gold King Mine and Sunnyside Mine are “facilities” under CERCLA. 42 U.S.C. § 9601(9). Furthermore, the numerous downstream reaches of the Animas and San Juan Rivers, where heavy metals and waste from the mines and the Sunnyside mine pool have been deposited, are separate “facilities,” under CERCLA.

125. “Releases” of “hazardous substances”—including arsenic, lead, mercury, cadmium, copper, and zinc—from these facilities have occurred and are still occurring. 42 U.S.C. §§ 9601(22) and (14). These releases include the August 5, 2015 Gold King Mine release, as well as past and present releases from the Sunnyside mine pool through the Gold King Mine, the Sunnyside Mine, and surrounding areas owned or operated by EPA, Environmental Restoration, Kinross, Kinross Gold U.S.A., and Sunnyside Gold. These hazardous substances have settled in sediments of the Animas and San Juan Rivers in New Mexico.



126. Because of these “releases” and the substantial threat of future releases, the State of New Mexico incurred response costs that were both “necessary” and “not inconsistent with the national contingency plan.” 42 U.S.C. § 9607(a)(4) and (a)(4)(B).

127. Kinross, Kinross Gold U.S.A., and Sunnyside Gold are “owners” and “operators” of the Sunnyside Gold Mine, a “facility” under CERCLA. 42 U.S.C. §§ 9607(a)(1)-(2).

128. By extensively managing, directing, and implementing reclamation activities at the Gold King Mine site, EPA, Environmental Restoration, Weston Solutions, and Harrison Western were “operators” of the site when the August 5, 2015 release occurred. These defendants had authority to control reclamation and remediation activities at the site, and their decisions caused the release that contaminated the Animas and San Juan Rivers in New Mexico.

129. EPA, Environmental Restoration, Weston Solutions, Harrison Western, and Sunnyside Gold by contract, agreement or otherwise arranged for the disposal, treatment, and transport of hazardous substances released from the mines. EPA, Environmental Restoration, Weston Solutions, Harrison Western, and Sunnyside Gold accepted hazardous substances from the mines for transport and disposal, including to settling ponds and other treatment facilities, and releases from those facilities occurred.

130. By taking intentional steps to dispose, treat, and transport hazardous substances at the Gold King Mine site—both before and on August 5, 2015—EPA, Environmental Restoration, Weston Solutions, Harrison Western, and Sunnyside Gold were “arrangers” under CERCLA. 42 U.S.C. § 9607(a)(3). EPA, Environmental Restoration, Weston Solutions, Harrison Western, and Sunnyside Gold had authority to dispose, treat, and transport of hazardous substances at the site, and no mining or waste disposal could occur without their approval.

131. Congress has waived the federal government's sovereign immunity for claims under CERCLA. 42 U.S.C. § 9620(a)(1).

132. EPA is a "person" under CERCLA. 42 U.S.C. § 9601(21). Under CERCLA § 9607(d)(1), any person is liable for costs and damages if that person negligently renders care or advice in a manner that is inconsistent with the National Contingency Plan.

133. Environmental Restoration and Weston Solutions are "persons" and "response action contractors" under CERCLA. 42 U.S.C. § 9619(a). Under CERCLA § 9619(a)(2), a response action contractor shall be liable for a release caused by its negligence, gross negligence, or intentional misconduct. Environmental Restoration and Weston Solution's negligence, gross negligence, and intentional misconduct caused or contributed to the release of hazardous substances from the mines.

134. The actions of EPA, Environmental Restoration, Weston Solutions, Harrison Western, Kinross, Kinross Gold U.S.A., and Sunnyside Gold substantially caused and contributed to the contamination of the Animas and San Juan Rivers in New Mexico, and they are jointly and severally liable for the resulting indivisible harms and contamination.

135. New Mexico has incurred costs responding to the release and the substantial threat of releases of hazardous substances from the Gold King Mine. These costs are not inconsistent with 42 U.S.C. § 9607(a)(4) and the National Contingency Plan requirements found in 40 C.F.R. Part 300. New Mexico continues to incur response costs to address contamination in the Animas and San Juan Rivers from the August 5 release, as well past and ongoing releases from the Gold King Mine, the Sunnyside Mine, the Sunnyside mine pool, and surrounding areas owned or operated by EPA, Environmental Restoration, Weston Solutions, Harrison Western, Kinross, Kinross Gold U.S.A., and Sunnyside Gold.

136. New Mexico is a “State” authorized to recover costs to assess damages to natural resources under CERCLA. 42 U.S.C. § 9607(a). Section 9607(a) provides that New Mexico may also recover interest on response costs incurred.

137. EPA, Environmental Restoration, Weston Solutions, Harrison Western, Kinross, Kinross Gold U.S.A., and Sunnyside Gold are jointly and severally liable to New Mexico for all response costs incurred and costs that New Mexico will incur to clean up the Animas and San Juan Rivers, including enforcement costs and prejudgment interest on those costs.

**SECOND CAUSE OF ACTION:  
DECLARATORY JUDGMENT UNDER CERCLA 42 U.S.C. § 9613(g)(2)  
AGAINST EPA, ENVIRONMENTAL RESTORATION, WESTON SOLUTIONS,  
HARRISON WESTERN, KINROSS, KINROSS GOLD U.S.A., AND SUNNYSIDE GOLD**

138. New Mexico incorporates the allegations in all preceding paragraphs.

139. CERCLA specifies that in any action for recovery of costs under 42 U.S.C. § 9607 “the court shall enter a declaratory judgment on liability for response costs . . . that will be binding on any subsequent action or actions to recover further response costs . . . .” 42 U.S.C. § 9613(g)(2).

140. New Mexico will continue to incur response costs to address the contamination of the Animas and San Juan Rivers.

141. New Mexico is entitled to entry of a declaratory judgment that EPA, Environmental Restoration, Weston Solutions, Harrison Western, Kinross, Kinross Gold U.S.A., and Sunnyside Gold are jointly and severally liable for future response costs and natural resource damages assessment costs based on the contamination of the Animas and San Juan Rivers to the extent that those costs are not inconsistent with the National Contingency Plan.

**THIRD CAUSE OF ACTION  
INJUNCTIVE RELIEF UNDER RCRA 42 U.S.C. § 6972(a)(1)(B)  
AGAINST ENVIRONMENTAL RESTORATION, KINROSS, AND SUNNYSIDE GOLD**

142. New Mexico incorporates the allegations in all preceding paragraphs.

143. RCRA authorizes citizen suits against “any person ... including the United States and any other governmental instrumentality or agency ... who has contributed or who is contributing to the past or present handling, storage, treatment, transportation, or disposal of any solid or hazardous waste which may present an imminent and substantial endangerment to health or the environment.” 42 U.S.C. § 6972(a)(1)(B). Under RCRA, a court may order any person referred to in paragraph (1)(B) “to take such . . . action as may be necessary” to eliminate endangerment to health or the environment. 42 U.S.C. § 6972(a).

144. RCRA defines “disposal” as “the discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into or on any land or water so that such solid waste or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including ground waters.” 42 U.S.C. § 6903(3).

145. New Mexico is a “person” under RCRA, 42 U.S.C. § 6903(15), and is entitled to commence a civil action under RCRA’s citizen suit provision.

146. Environmental Restoration, Kinross, and Sunnyside Gold are “persons” under RCRA. 42 U.S.C. § 6903(15).

147. The Gold King Mine release discharged arsenic, lead, mercury, cadmium, copper, and zinc into the Animas and San Juan Rivers. These substances are “hazardous wastes” and/or “solid wastes” under RCRA. 42 U.S.C. § 6903(5)(B).

148. By directly causing the Gold King Mine release, Environmental Restoration, Kinross, Kinross Gold U.S.A., and Sunnyside Gold have contributed and are contributing to the

disposal of solid and/or hazardous wastes, which present an imminent and substantial endangerment to the health and the environment in the Animas and San Juan Rivers both above and below the Colorado-New Mexico state line.

149. By letter dated January 14, 2016, New Mexico notified Environmental Restoration, Kinross, and Sunnyside Gold of its intent to file suit to restrain or abate the conditions that present or may present an imminent and substantial endangerment to health or the environment in New Mexico. *See* Exhibit E. New Mexico's letter followed the notice requirements found in 42 U.S.C. § 6972(b).

150. On January 15, 2016—one day after New Mexico served its RCRA notice letter—EPA released an “action memorandum,” which documents EPA's decision to undertake an emergency removal action under CERCLA Section 104 after the Gold King Mine blowout. Since August 5, EPA has attempted to stabilize the Gold King Mine site and control the flow of acid mine drainage that significantly increased due to the August 5 release. EPA has also installed a temporary water treatment system to treat the Gold King portal drainage through November 2016. EPA stopped monitoring the Animas River watershed in mid-December 2015.

151. The memorandum states that EPA's emergency response actions in New Mexico only involved providing alternative water supplies for human consumption, crop irrigation, and livestock during the temporary shutdown and diversions of the rivers immediately after the release. EPA takes that position that “future provision of alternative water supplies [in New Mexico] may be provided as determined appropriate by EPA.” EPA is taking no further remedial actions related to the solid or hazardous waste disposed of in New Mexico.

152. After EPA released the memorandum, NMED provided EPA with evidence that high levels of metals, turbidity, and suspended solids arrived in New Mexico's rivers after



various high-flow and monsoonal events. EPA has consistently discounted or ignored this evidence. What is more, EPA continues to claim that contaminant levels in river water and sediment have returned to “pre-spill conditions,” indicating that it plans to take no further action despite its awareness of sediments contaminated at levels that present a risk to human health or the environment. And even though evidence of accumulations of discolored sediment and sediment samples with unacceptable levels of heavy metals in Durango have been sent to EPA, both EPA and Colorado have declined to investigate further. Those sediments had lead concentrations six times greater than cleanup levels that EPA uses at other sediment sites; they also had concentrations of various other metals at unacceptable risk levels. For all of these reasons, EPA’s actions at the Gold King Mine site do not address the imminent and substantial endangerment to health or the environment in New Mexico.

153. Without explanation, EPA has modified the arsenic and lead screening levels in the Animas to levels known to pose a risk to children (*e.g.*, 20,000 parts per million lead in sediment). Likewise, Colorado’s Department of Public Health and Environment has adopted EPA’s recreational screening levels, ignoring residents in the area by simply issuing public health messages such as: “Avoid discolored sediment/soil” and “Children under age six should be supervised when playing in and around the river to ensure they don’t ingest river water or sediment.”

154. The 880,000 pounds of heavy metals released from the Gold King Mine on August 5, 2015 included arsenic, copper, lead, mercury, and selenium. A substantial mass of these heavy metals now sit in the sediments of the Animas and San Juan Rivers, where they present an imminent and substantial endangerment to the ecosystem in northern New Mexico. The San Juan River—from its confluence with the Animas River to the Navajo Nation border—

is managed for recovery of federally endangered fish species—the Colorado pikeminnow (*Ptychocheilus Lucius*) and razorback sucker (*Xyrauchen texanus*)—and support dozens of other species. Although the long-term heavy metal concentration in the Animas River remains uncertain, chronic exposure to heavy metals has been shown to have significant negative effects on fish behavior, gonad and embryonic development, and can cause other harmful effects. Heavy metals can also bio-accumulate into fish tissues and organs and transfer to other wildlife species that prey on fish, such as eagles and otters. The potential for increased levels of selenium is particularly troublesome for the future of endangered fish in the San Juan River.

155. More than ninety days have passed since NMED sent Environmental Restoration, Kinross, and Sunnyside Gold its notice of intent to file suit under RCRA, 42 U.S.C. § 6972(a)(1)(B). The imminent and substantial threats described in that letter are continuing or are reasonably likely to continue. Therefore, New Mexico is entitled to entry of an injunction that may require, among other things, a full investigation and remediation of segments of the Animas River downstream of Silverton, Colorado, where vast amounts of hazardous substances from the Gold King Mine and neighboring mines now sit.

**FOURTH CAUSE OF ACTION:  
AGAINST THE ADMINISTRATOR OF EPA UNDER CWA 33 U.S.C. § 1365(h)**

156. New Mexico incorporates the allegations in all preceding paragraphs.

157. The CWA prohibits, among other things, “the discharge of any pollutant by any person.” 33 U.S.C. § 1311(a). The CWA’s implementing regulations define “person” to include not just private individuals and companies, but also a state or federal Agency. 40 C.F.R. § 122.2.

158. The CWA allows mining companies to apply for National Pollutant Discharge Elimination System (“NPDES”) permits. These permits limit the type and quantity of pollutants that will ultimately be released into navigable waters. While NPDES permits are normally

issued by EPA, states can petition to run their own NPDES permit programs. U.S.C. § 1342(a)-(b). In administering these programs, states are free to treat EPA's pollution limits as a floor and impose requirements that are more stringent. 40 C.F.R. §§ 123(i)(1), 123.25. EPA has delegated permitting authority to Colorado and it is administered by WQCD under the Colorado Water Quality Control Act, COLO.REV.STAT. § 25-8-301, *et seq.*

159. Once an NPDES permit has been issued, the state, EPA, citizens, and the governors of other states, can sue to enforce it. *See* 33 U.S.C. §§ 1319(a)(3) (EPA enforcement), 1365(a) (citizen suit provision), 1365(h) (state governor suit provision). Section 505(h) of the CWA authorizes the Governor of a State to bring a civil action against the Administrator of EPA for failing to enforce any “effluent standard or limitation” under the CWA which is occurring in another State and is causing an adverse effect on the public health or welfare in her State.<sup>6</sup>

160. Section 505(f)(1) of the Clean Water Act defines “effluent standard or limitation” to include “an unlawful act” under Section 301(a) of the Clean Water Act, 33 U.S.C. § 1311(a). As noted above, Section 301(a) of the CWA states that “the discharge of any pollutant by any person shall be unlawful,” unless authorized by an NPDES permit. 33 U.S.C. § 1311(a).

161. Discharges from inactive mines are “pollutants” and can violate the CWA. *See* 40 C.F.R. § 122.26(b)(14)(iii) (stating “active or inactive mining operations” are among the industrial activities that require a stormwater discharge permit under 33 U.S.C. § 1342(p)); EPA Region VIII policy statement, Ref. 8WM-C (Dec. 22, 1993) (stating “discharges from abandoned mine adits are point sources which require a traditional NPDES permit”).

162. Further, EPA issued regulations in 1985 establishing that post-mining discharges are subject to the NPDES scheme. *See* 50 Fed. Reg. 41,296 (Oct. 9, 1985). In those regulations,

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<sup>6</sup> Governor Susana Martinez has authorized Secretary Ryan Flynn of the Environment Department to exercise her right to sue under Clean Water Act Section 505(h).

EPA “reemphasized that post-bond release discharges are subject to regulation under the Clean Water Act,” observing that “[I]f a point source discharge occurs after bond release, then it must be regulated through an NPDES permit.” *Id.* at 41,298. To the extent parties do not comply, the regulations state that they will be “subject to enforcement action by EPA under section 309 of the Act and by citizens under section 505(a)(1) of the Act.” *Id.* at 41,298. While these regulations explicitly address situations where a bond is released rather than forfeited to the state, EPA’s intent is plain: both those who generate pollution and those who superintend ongoing discharges must obtain NPDES permits.

163. Colorado has operational responsibility to treat discharges of acid mine drainage at sites where reclamation of mined areas has not been completed, including discharges from mining sites in the Upper Animas River Basin (*e.g.*, the Sunnyside Mine, Gold King Mine). As previously alleged, for more than a decade, Colorado has failed to permit numerous inactive or abandoned mines in the Upper Animas River Basin, and elsewhere, that are discharging acid mine drainage and pollutants into navigable waters. Past and present discharges from these inactive mines—including but not limited to the Gold King Mine release—have entered and are still entering New Mexico’s waters and are causing adverse effects on the public health and welfare in New Mexico. Colorado’s failure to permit discharges from inactive mines is an “unlawful act” under Section 301(a) of the CWA. Accordingly, New Mexico is authorized, through Section 505(h), to compel the Administrator of EPA to abate pollution from the hundreds of inactive and abandoned mines that discharge pollutants into the Animas River in Colorado and adversely affect the public health and environment in New Mexico.

**FIFTH CAUSE OF ACTION:  
PUBLIC NUISANCE AGAINST THE UNITED STATES, ENVIRONMENTAL  
RESTORATION, WESTON SOLUTIONS, HARRISON WESTERN, KINROSS,  
KINROSS GOLD U.S.A., AND SUNNYSIDE GOLD**

164. New Mexico incorporates the allegations in all preceding paragraphs.

165. The use and enjoyment of the Animas and San Juan Rivers in New Mexico are rights common to, and belonging to, all members of the public.

166. Kinross, Kinross Gold U.S.A., and Sunnyside Gold specifically intended to plug the Sunnyside Mine's American Tunnel and its other workings.

167. Kinross, Kinross Gold U.S.A., and Sunnyside Gold knew or should have known that plugging the American Tunnel and the other drainage features of the Sunnyside Mine would increase the pressure of acidic water within the mine's workings. They also knew or should have known that the water would rise to a level above the portals of neighboring mines, and could create new discharges from neighboring mine portals that would offset any reduction in pollutant loading from the American Tunnel bulkhead.

168. Kinross, Kinross Gold U.S.A., and Sunnyside Gold knew or should have known that ending the treatment of the acid mine drainage from the Sunnyside mine pool would send vast amounts of contamination into New Mexico's waters. In fact, immediately after the shuttering of the Gladstone treatment facility, the water quality of the Animas and San Juan Rivers declined, and native trout all but disappeared in the Animas above Durango, Colorado. Sunnyside Gold's discharges of contamination flowed into New Mexico and beyond, degrading New Mexico's waters and riverbeds for more than a decade.

169. Kinross, Kinross Gold U.S.A., and Sunnyside Gold knew that they created a hazardous condition by plugging the Sunnyside Mine and other mines, and they disregarded multiple warnings about the potential consequences of that decision.



170. Kinross, Kinross Gold U.S.A., and Sunnyside Gold knew or should have known that discharges from the Gold King Mine had increased dramatically because of the plugging of the American Tunnel and other features that once drained the Sunnyside's workings.

171. Kinross, Kinross Gold U.S.A., and Sunnyside Gold knew or should have known that the Sunnyside mine pool continued to rise with each successive mine it flooded. And they knew or should have known that they flooded the Gold King Mine with acid mine drainage that formed in the Sunnyside mine pool.

172. Kinross, Kinross Gold U.S.A., and Sunnyside Gold knew or should have known that foreseeable future reclamation activities at the Gold King Mine, including digging out the debris and blockage at Gold King Mine Level 7 adit, could cause a blowout of the water impounded in the mine.

173. The United States, through its agency EPA, Environmental Restoration, and Harrison Western intentionally dug out the pipes and debris at the Gold King Mine Level 7 adit. They knew or should have known that digging out the pipes and earthen debris would release an enormous volume of water impounded in the mine, and these actions directly caused the blowout of the Gold King Mine on August 5, 2015.

174. Environmental Restoration and Weston Solutions did not construct a water management system to handle the anticipated release of acid mine drainage from the Gold King Mine Level 7 adit, as prescribed by their own work plan and by OSC Steven Way. They also failed to prepare a Health and Safety Plan or Emergency Action Plan that included a contingency plan to address a large release of impounded acid mine drainage. They knew or should have known that the failure to build and install a water management system and the lack of a

contingency plan would increase the likelihood that a large volume of acid mine drainage would contaminate the Animas River system and the environment.

175. Colorado Mined Land Reclamation Act (“MLRA”), Colo. Rev. Stat. § 34-32-101 *et seq.*, and its implementing regulations, 2 Colo. Code. Regs. § 407-1, regulates reclamation of mined land and fosters the protection of human health, welfare, and the environment. The statute and its implementing rules require operators to submit and obtain approval of an Environmental Protection Plan, *see* § 34-32-116.5(5), that will “protect all areas that have potential to be affected by designated chemicals, toxic or acid-forming materials or acid mine drainage.” 2 Colo. Code. Regs. § 407.1, Rule 6.4.21. To that end, an Environmental Protection Plan must:

Fully describe the procedures for the disposal, decommissioning, detoxification or stabilization for all designed chemicals and toxic or acid-forming materials. Specifically describe measures to be taken to prevent any unauthorized release of pollutants to the environment. Inadequate reclamation and closure practices for such designated chemicals, toxic or acid-forming materials and how unauthorized discharge of acid mine drainage will be prevented.

2 Colo. Code. Regs. § 407.1, Rule 6.4.21(6)(a). The MLRA and its implementing regulations were relevant and appropriate to the activities that triggered the August 5 blowout. The Gold King Mine operation was similar to reclamation at a private mining operation, and EPA, DRMS, Environmental Restoration, Weston Solutions, and Harrison Western should have considered the substantive provisions of those regulations, including water control measures, before attempting to remove the adit blockage.

176. EPA failed to ensure that Environmental Restoration, Weston Solutions, and Harrison Western developed and implemented an adequate Health and Safety Plan and Emergency Action Plan for the Gold King Mine site operation. The actual Health and Safety Plan for the Gold King Mine operation did not comply with OSHA requirements for hazardous waste site operations identified in 29 C.F.R. § 1910.120, and did not comply with EPA

regulations for response actions. *See* 40 C.F.R. § 300.700(c)(5)(i) (incorporating the requirement of 40 C.F.R. § 300.150(a) that “[r]esponse actions under the NCP ... comply with the provisions for response action worker safety and health in 29 C.F.R. § 1910.120).

177. The United States, through its agency EPA, Environmental Restoration, Weston Solutions, and Harrison Western ignored provisions of the Federal Mine Safety and Health Act of 1977 (“MSHA”) and Title 30, Code of Federal Regulations, Part 75, which are intended to protect workers from uncontrolled releases of impounded water in abandoned mine workings. Before any excavation near impounded water in flooded abandoned mine workings can occur, mine operators are required to determine the location and extent of the water (by reviewing mine maps, geophysical methods, or by direct observation through boreholes) and to implement measures that will protect workers from a sudden inflow of water. *See* 30 C.F.R. § 75.372 (requiring “up-to-date map of the mine drawn to a scale of not less than 100 nor more than 500 feet to the inch”); *id.* § 75.388(a)(2) (requiring mine operators to drill boreholes as the working place approaches within 200 feet of an area of the mine not shown by certified surveys); *id.* § 75.1200 (requiring mine operators to maintain an “accurate and up-to-date map” of a mine “in an area on the surface of the mine”).<sup>7</sup> Indeed, EPA’s internal investigation and BOR’s technical review of the blowout both concluded that the failure to drill a borehole into the adit to determine

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<sup>7</sup> The borehole drilling requirements of section 75.388 track and expand upon those imposed by section 317(b) of MSHA, 30 U.S.C. § 877(b). The borehole provision was originally enacted in the Federal Coal Mine Health and Safety Act of 1969, 30 U.S.C. § 801 et seq. (1976) and carried over without change to MSHA. Its legislative history is short, but telling: “The necessity of maintaining drill holes in advance of the face in any working place approach abandoned mine openings known or suspected to contain dangerous quantities of water or noxious or explosive gases is obvious and such are required by law in many coal-mining states.” S. Rep. No. 411, 91st Cong., 1st Sess. 94 (1969), *reprinted in* Senate Subcommittee on Labor, Committee on Labor and Public Welfare, 94th Cong., 1st Sess., Part I *Legislative History of the Federal Coal Mine Health and Safety Act of 1969*, at 210 (1975). The text of section 75.388(a) makes plain that the borehole drilling requirements apply in lieu of the pre-shift examination required by 30 C.F.R. § 75.360, which by its nature cannot take place in inaccessible areas of a mine. In its twin goals of preventing entry into sealed areas containing unknown hazards and promoting the timely ascertainment of those hazards, section 75.388 serves the same purpose as the pre-shift examination requirement: preventing human exposure to undetermined hazards.

the volume and pressure of water impounded behind the adit blockage was a primary cause of the August 5, 2015 blowout.

178. The contamination of the Animas River and San Juan River and surrounding environs that resulted from releases of hazardous substances caused by the United States, through its agency EPA, Environmental Restoration, Weston Solutions, Harrison Western, Kinross, Kinross Gold U.S.A., and Sunnyside Gold constitutes a physical invasion of public and private property. The contamination is also an unreasonable and substantial interference, both actual and potential, with the exercise of New Mexico's right and the common right of the public to the use and enjoyment of the rivers, including the biota, lands, waters, and sediments therein.

179. These releases have interfered with and continue to interfere with New Mexico's and the public's use and enjoyment of the rivers and surrounding areas. These releases also present an unreasonable and substantial danger to the public's health and safety. New Mexico has suffered special injuries, which the public as a whole does not share. New Mexico has and will continue to suffer lost economic activity, tax revenues, and stigmatic damages arising from these releases.

180. The past, present and ongoing conduct of the United States, through its agency EPA, Environmental Restoration, Weston Solutions, Harrison Western, Kinross, Kinross Gold U.S.A., and Sunnyside Gold, and the contamination caused by their conduct, constitute a public nuisance. These defendants have caused continuing and substantial injuries, which threaten irreparable harm to New Mexico's public and its environment. This public nuisance will continue as long as the Animas and San Juan Rivers and surrounding areas are contaminated with the hazardous substances released from the Gold King and Sunnyside mine pool.

181. Unless the United States, through its agency EPA, Environmental Restoration, Weston Solutions, Harrison Western, Kinross, Kinross Gold U.S.A., and Sunnyside Gold abate this public nuisance in the Animas and San Juan Rivers and surrounding areas, they will remain liable for the creation and continued maintenance of a public nuisance.

182. The United States, through its agency EPA, Environmental Restoration, Weston Solutions, Harrison Western, Kinross, Kinross Gold U.S.A., and Sunnyside Gold acted in concert, or successively.

183. The harm caused by these Defendants' tortious conduct is indivisible and they are jointly and severally liable.

184. New Mexico is entitled to recover damages from the United States, Environmental Restoration, Weston Solutions, Harrison Western, Kinross, Kinross Gold U.S.A., and Sunnyside Gold.

185. New Mexico is entitled to entry of an order compelling the United States, through its agency EPA, Environmental Restoration, Weston Solutions, Harrison Western, Kinross, Kinross Gold U.S.A., and Sunnyside Gold, jointly and severally, to abate the nuisance.

**SIXTH CAUSE OF ACTION:  
TRESPASS AGAINST THE UNITED STATES, WESTON SOLUTIONS, HARRISON  
WESTERN, ENVIRONMENTAL RESTORATION, KINROSS, KINROSS GOLD U.S.A.,  
AND SUNNYSIDE GOLD**

186. The State of New Mexico incorporates the allegations in all preceding paragraphs.

187. Kinross, Kinross Gold U.S.A., and Sunnyside Gold specifically intended to plug the Sunnyside Mine's American Tunnel and its other workings.

188. Defendants Kinross, Kinross Gold U.S.A., and Sunnyside Gold knew or should have known that plugging the American Tunnel would increase the pressure of acidic water within the mine's workings. They knew or should have known that the water could rise to a



level above the portals of neighboring mines, and could create new discharges that would offset any reduction in pollutant loading from the American Tunnel bulkhead.

189. Kinross, Kinross Gold U.S.A., and Sunnyside Gold knew that they created a hazardous condition by plugging the Sunnyside Mine and other mines, and they disregarded multiple warnings about the potential consequences of that decision.

190. Kinross, Kinross Gold U.S.A., and Sunnyside Gold knew or should have known that stopping the treatment of the acid mine drainage from the Sunnyside mine pool would send vast amounts of contamination into New Mexico's waters and beyond. In fact, immediately after the shuttering of the Gladstone treatment facility, the water quality of the Animas and San Juan Rivers declined, and native trout all but disappeared in the Animas above Durango, Colorado. Sunnyside Gold's discharges of contamination have degraded New Mexico's waters and riverbeds for more than a decade.

191. Kinross, Kinross Gold U.S.A., and Sunnyside Gold knew or should have known that the Sunnyside mine pool continued to rise with each successive mine it flooded. And they knew or should have known that they flooded the Gold King Mine with acid mine drainage that formed in the Sunnyside mine pool.

192. Kinross, Kinross Gold U.S.A., and Sunnyside Gold knew or should have known that discharges from the Gold King Mine had increased because of the plugging of the American Tunnel and successive mines.

193. Kinross, Kinross Gold U.S.A., and Sunnyside Gold knew or should have known that foreseeable reclamation activities at the Gold King Mine, including digging out the debris and blockage at Gold King Mine Level 7 adit, could result in a blowout of the water impounded in the mine.

194. The United States, through its agency EPA, Environmental Restoration, and Harrison Western intentionally dug out the pipes and debris at the Gold King Mine Level 7 adit. They knew or should have known that digging out the pipes and debris would release an enormous amount of water impounded in the mine, and these actions directly caused the blowout of the Gold King Mine on August 5, 2015.

195. Environmental Restoration and Weston Solutions failed to build and install a water management system to handle the anticipated release of acid mine drainage from the Gold King Mine Level 7 adit. They also failed to prepare a work plan that included contingency plans for blowout. They knew or should have known that the failure to install a water management system and the lack of a contingency plan would increase the risk that a large release of acid mine drainage would enter into and contaminate the Animas River system and the environment.

196. Accordingly, the United States, through its agency EPA, Environmental Restoration, Weston Solutions, Harrison Western, Kinross, Kinross Gold U.S.A., and Sunnyside Gold are liable for trespass, and continued trespass, because they intentionally released, discharged, and failed to prevent the releases of acid mine water, mine-dump runoff, metals, and other hazardous substances into the Animas and San Juan Rivers and the surrounding environs within New Mexico's borders.

197. As long as New Mexico's waterways and surrounding areas remain contaminated with these hazardous substances, the trespass will continue.

198. The harm caused by these defendants' tortious conduct is indivisible and they are jointly and severally liable.

199. New Mexico is entitled to recover compensatory and restitutionary damages from Environmental Restoration, Kinross, Kinross Gold U.S.A., and Sunnyside Gold.

200. New Mexico is entitled to entry of an order compelling Environmental Restoration, Kinross, Kinross Gold U.S.A., and Sunnyside Gold, jointly and severally, to abate the trespass.

**SEVENTH CAUSE OF ACTION:  
NEGLIGENCE AND GROSS NEGLIGENCE AGAINST THE UNITED STATES,  
ENVIRONMENTAL RESTORATION, WESTON SOLUTIONS, HARRISON  
WESTERN, KINROSS, KINROSS GOLD U.S.A., AND SUNNYSIDE GOLD**

201. The State of New Mexico incorporates the allegations in all preceding paragraphs.

202. The United States, through its agency EPA, Environmental Restoration, Weston Solutions, Harrison Western, Kinross, Kinross Gold U.S.A., and Sunnyside Gold had a duty to oversee, manage, maintain, and regulate the Gold King Mine and Sunnyside Mine with reasonable care. They also had a duty to conduct their investigations and work activities at the mines with reasonable care. It was foreseeable that the failure to use reasonable care in performing these activities would cause injuries and damages to states, local communities, and individuals downstream of the mines.

203. As further alleged below, the actions of the United States, through its agency EPA, Environmental Restoration, Harrison Western, Kinross, Kinross Gold U.S.A., and Sunnyside Gold were grossly negligent, meaning their actions constituted reckless, wanton, and willful misconduct.

204. Kinross, Kinross Gold U.S.A., and Sunnyside Gold were negligent or grossly negligent by plugging the American Tunnel and surrounding mine portals, thereby creating a highly hazardous condition within the Gold King Mine.

205. Kinross, Kinross Gold U.S.A., and Sunnyside Gold were negligent or grossly negligent by failing to treat the discharges from the American Tunnel and surrounding mine portals.

206. The United States, through its agency EPA, Environmental Restoration, Weston Solutions, and Harrison Western were negligent or grossly negligent by, among other things:

- Failing to investigate or test the hydraulic pressure within Gold King Mine Level 7 adit before digging out the earthen plug, despite knowing that the mine was holding back significant quantities of water;
- Judging the elevation of the water *inside* the mine based primarily on observations of seepage *outside* the mine, and relying on flawed assumptions that contradicted publicly available records;
- Excavating the Level 7 portal's drainage pipes and the earthen plug without using a stinger pipe, a pump, and other equipment necessary to dewater the mine in a safe and controlled manner, in violation of Mr. Way's specific, mandatory instructions;
- Conducting operations with a work plan that lacked any contingency plan addressing the potential for an uncontrolled release of water and hazardous substances from the mine, in violation of OSHA hazardous waste operation requirements identified in 29 CFR 1910.120.<sup>8</sup>
- Deviating from the Mr. Way's specific written instructions and plans concerning the timing, scope, and method of excavating the collapsed portal;
- Carrying out adit excavation work on August 4 and 5 in Mr. Way's absence and without waiting for BOR's engineer to inspect the site and provide advice—again, in violation of Mr. Way's unequivocal instructions.

207. The conduct of the United States, through its agency EPA, Environmental Restoration, Weston Solutions, Harrison Western, Kinross, Kinross Gold U.S.A., and Sunnyside Gold caused direct and identifiable harms to New Mexico and its citizens.

208. The harm caused by these defendants' tortious conduct is indivisible and they are jointly and severally liable.

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<sup>8</sup> The safety plan was also inadequate and inconsistent with the NCP, which requires a worker health and safety plan before any cleanup activity commences. *See* 40 C.F.R. § 300.700(c)(5)(i) (incorporating the requirement of 40 C.F.R. § 300.150(a) that "[r]esponse actions under the NCP . . . comply with the provisions for response action worker safety and health in 29 C.F.R. § 1910.120). Section 1910.120 further states that employers must have "a site-specific safety and health plan . . . [at] each phase of site operation. 29 C.F.R. § 1910.120(b)(1), (b)(4).

209. New Mexico is entitled to recover compensatory damages from the United States, through its agency EPA, Environmental Restoration, Weston Solutions, Harrison Western, Kinross, Kinross Gold U.S.A., and Sunnyside Gold.

210. New Mexico is entitled to recover punitive damages from Environmental Restoration, Weston Solutions, Harrison Western, Kinross, Kinross Gold U.S.A., and Sunnyside Gold.

### **PRAYER FOR RELIEF**

WHEREFORE, Plaintiff, the State of New Mexico, prays for an order and judgment:

211. Declaring that Defendants EPA, Environmental Restoration, Weston Solutions, Harrison Western, Kinross, Kinross Gold U.S.A., and Sunnyside Gold are jointly and severally liable under CERCLA, 42 U.S.C. § 9607(a), for all costs, including prejudgment interest, incurred by New Mexico in responding to releases or threatened releases of hazardous substances from the Gold King, the Sunnyside Mine, or the American Tunnel to the date of judgment;

212. Declaring that Defendants EPA, Environmental Restoration, Weston Solutions, Harrison Western, Kinross, Kinross Gold U.S.A., and Sunnyside Gold are jointly and severally liable under CERCLA, 42 U.S.C. § 9613(g)(2), for all response costs that will be incurred by New Mexico in responding to releases or threatened releases of hazardous substances from the Gold King Mine, the Sunnyside Mine, or the American Tunnel;

213. Declaring that Defendants Environmental Restoration, Kinross, Kinross Gold U.S.A., and Sunnyside Gold are in violation of RCRA's imminent and substantial endangerment provision, 42 U.S.C. § 6972(a)(1)(B), until they cease the disposal of hazardous substances from



the Gold King and Sunnyside Mines including, but not limited to, acid wastewater, mine sludge, mine-dump runoff, and metals, into the Animas River watershed;

214. Compelling the Administrator of EPA, Defendant McCarthy, to seek abatement of pollution from the numerous inactive and abandoned mines in Colorado that discharge acid mine drainage and other waste into the Animas River in Colorado and adversely affect the public health and environment in New Mexico;

215. Declaring that Defendants the United States, through its agency EPA, Environmental Restoration, Weston Solutions, Harrison Western, Kinross, Kinross Gold U.S.A., and Sunnyside Gold were negligent, grossly negligent, or both, and awarding New Mexico compensatory, consequential, and punitive damages caused by Defendants' conduct, including, but not limited to, investigation, clean-up, and remedial costs, economic loss, loss of use, diminution in value, and stigma damages;

216. Disgorging all profits made, or costs avoided, by Defendants Kinross, Kinross Gold U.S.A., and Sunnyside Gold, because of their tortious and wrongful conduct;

217. Ordering Defendants the United States, through its agency EPA, Environmental Restoration, Weston Solutions, Harrison Western, Kinross, Kinross Gold U.S.A., and Sunnyside Gold to abate the nuisance and cure the trespass in the Animas and San Juan Rivers within Colorado;

218. Declaring that Defendants the United States, through its agency EPA, Environmental Restoration, Weston Solutions, Harrison Western, Kinross, Kinross Gold U.S.A., and Sunnyside Gold are jointly and severally liable for all costs incurred and costs that may be incurred by New Mexico to abate the nuisance and cure the trespass in the Animas and San Juan Rivers within New Mexico;

219. Awarding New Mexico its costs of this action, including attorneys' fees; and

220. Granting any further relief, at law or in equity, as this Court deems just and proper.

Dated: November 18, 2016

Respectfully submitted,

---

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***Counsel for Plaintiff New Mexico***

**ADAPTIVE MANAGEMENT SITE MANAGEMENT PLAN  
FOR THE  
BONITA PEAK MINING DISTRICT  
SAN JUAN COUNTY, COLORADO**



**FINAL  
November 2020**

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**CERTIFICATION**  
**ADAPTIVE MANAGEMENT SITE MANAGEMENT PLAN**  
**FOR THE**  
**BONITA PEAK MINING DISTRICT**  
**SAN JUAN COUNTY, COLORADO**

This Adaptive Management (AM) Site Management Plan (SMP) was prepared collaboratively by the U.S. Environmental Protection Agency, U.S. Forest Service, Bureau of Land Management, Colorado Department of Health and Environment, Silverton Planning Group, and the Community Advisory Group. This AM SMP provides a guiding framework for planning, prioritizing, decision-making, documenting, and knowledge integration of site activities at the Bonita Peak Mining District. This AM SMP is a living document and will be reviewed and updated, as determined necessary as part of the AM site principles management process. This certification provides approval of this AM SMP by the undersigned signatory authorities for the project stakeholders.



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Christina Progross  
Lead Remedial Project Manager  
U.S EPA Region 8

11/23/20

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Date



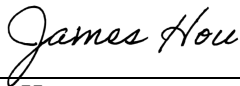
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Robert Parker  
Remedial Project Manager  
U.S. EPA Region 8

11/23/2020

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Date



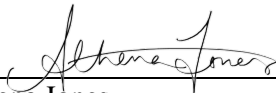
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James Hou  
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U.S. EPA Region 8

11/25/2020

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## ACRONYMS

AM	Adaptive Management
BLM	Bureau of Land Management
BPMD	Bonita Peak Mining District
CAG	Community Advisory Group
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CIP	Community Involvement Plan
CSM	Conceptual Site Model
DMP	Data Management Plan
DOI	Department of Interior
DQO	Data Quality Objective
DRMS	Division of Reclamation, Mining and Safety
EPA	U.S. Environmental Protection Agency
FS	Feasibility Study
FSP	Field Sampling Plan
IROD	Interim Record of Decision
IWTP	Interim Water Treatment Plant
LTM	Long-Term Monitoring
MOU	Memorandum of Understanding
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NHPA	National Historic Preservation Act
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
PRP	Potentially Responsible Party
QAPP	Quality Assurance Project Plan
RA	Remedial Action
RD	Remedial Design
RI	Remedial Investigation
RPM	Remedial Project Manager
SGC	Sunnyside Gold Corporation
SMP	Site Management Plan
SPG	Silverton Planning Group
SUIT	Southern Ute Indian Tribe
TVS	Table Value Standards
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFS	U.S. Forrest Service
WGPP	Workgroup Project Plan
WQX	Water Quality Data System

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## **1.0 INTRODUCTION**

This Adaptive Management (AM) Site Management Plan (SMP) was developed as part of a pilot study conducted by the U.S. Environmental Protection Agency (EPA) to demonstrate how AM can be implemented at a large complex mining site. Specifically, this AM SMP provides a framework for decision making, documentation, planning, and prioritization of activities within the Bonita Peak Mining District (BPMD) Superfund Site, herein referred to as the BPMD Site. Lessons learned from this pilot study will be utilized to broaden the use of AM at the site and at other National Priorities List (NPL) sites across the nation.

### **1.1 PLAN PURPOSE**

The purpose of this BPMD Site AM SMP is to provide an overarching framework and methodology for all planning, decision making, prioritization, scheduling, documentation, and knowledge integration for Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) response activities at the site. This BPMD AM SMP is a living document that is periodically revisited and revised.

### **1.2 ADAPTIVE MANAGEMENT**

AM is an approach often utilized at large and/or complex sites where there is considerable uncertainty, limited resources, and competing priorities among stakeholders. AM requires the development of clear strategies based on site goals and objectives and requires use of measurable decision points and formal decision making grounded in sound understanding of site conditions and uncertainties. Despite uncertainties, data-driven decisions are made to implement actions and remedies while allowing for the ability to adapt if these uncertainties result in fundamental changes to site conditions. The goal of AM is to coordinate among stakeholders to make decisions, considering risk and uncertainty, with the purpose of encouraging continual progress and incorporating lessons learned.

#### **1.2.1 Adaptive Management at Comprehensive Environmental Response, Compensation, and Liability Act Sites**

EPA's Superfund program defines AM as a formal and systematic site or project management approach centered on rigorous site planning and a firm understanding of site conditions and uncertainties. This technique, rooted in the sound use of science and technology, encourages continuous re-evaluation and management prioritization of site activities to account for new information and changing site conditions. A structured and continuous planning, implementation, and assessment process allows EPA, states, other federal agencies, or potentially responsible parties (PRPs) to make management and resource decisions with the goal of incrementally reducing site uncertainties while supporting continued site progress.

When applying AM at CERCLA sites, activities and response decisions must be done in accordance with CERCLA regulations, policy, and guidance. Moreover, the application of AM, to the extent practicable, strives to establish site or project strategies that employ existing CERCLA process flexibilities such as the use or application of early and/or interim actions to address immediate risks, to mitigate source migration, and/or to return portions of sites to beneficial use pending more detailed evaluations at other parts of sites.

#### **1.2.2 Adaptive Management Planning and Applications at Bonita Peak Mining District**

Critical to the success of AM is the planning and development of an AM SMP and/or an AM Project Management Plan. Once developed, this plan guides implementation of the CERCLA process, ensuring transparent and inclusive decision-making. Both AM planning and execution are conducted in a manner

that ensures stakeholder input throughout the process. The roles and responsibilities of federal agencies, states, and stakeholders are presented in Chapter 2.0.

Two key components of AM planning at CERCLA sites are the development of Site Principles that consist of goals, objectives, and strategies for the site or project, and the documentation of an AM decision-making process.

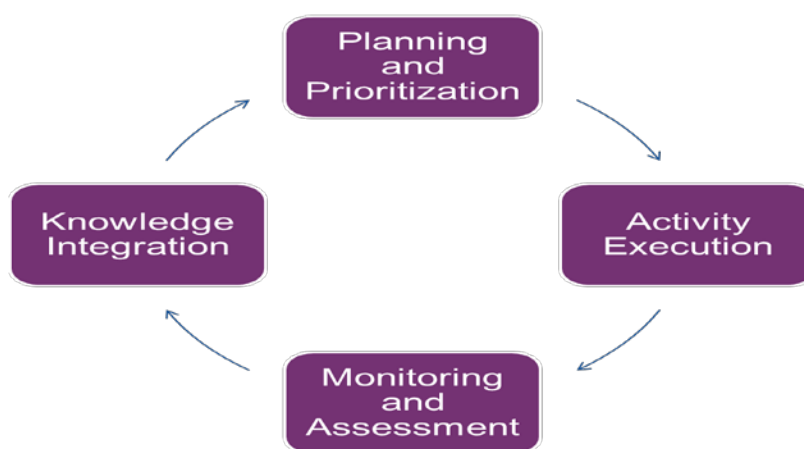
### 1.2.2.1 Development of Site Principles

Site Principles are the goals, objectives, and strategies that provide a basis to guide all CERCLA work at a site (in this case, the BPMD Site). Site Principles development is a key component of AM planning, and it is critical that the development of these principles is done collaboratively with key site stakeholders. As such, the prioritization of activities and decision making at the site should be done with the focus on making progress against the Site Principles. Without the development and documentation of Site Principles, a large or complex site can lack direction and transparency on high-level CERCLA process and area priorities.

The current Site Principles for the BPMD Site and a summary of how they were developed are presented in Chapter 3.0.

### 1.2.2.2 AM Decision Making

AM decision making is the process used by the site team to prioritize, make decisions, and adapt activities to changing site conditions. The AM decision making process is intended to be iterative, such that results of previous actions are incorporated into the planning phase of future actions. The process for AM decision making typically involves four main steps (**Figure 1.1**):



**Figure 1.1. AM Decision Making Process**

- **Step 1: Planning and Prioritization:** This step uses standardized planning tools to align priorities and resources to make decisions regarding work that will be done at the site.
- **Step 2: Activity Execution:** This is the step when priority activities are executed. Depending on the activity, this step in itself may identify the need for acquisition, activity planning, and completion documentation.
- **Step 3: Monitoring and Assessment:** This step is an ongoing activity that provides the data and information necessary to evaluate the performance of activities at the site in a manner that tests hypotheses, evaluates progress made toward goals and objectives, and evaluates efficacy of

innovative technologies. Additionally, this step provides the information needed to learn, adapt (Step 4), and provide information necessary for future planning and prioritization efforts (Step 1).

- **Step 4: Knowledge Integration:** This step is commonly referred to as the learning phase of AM. Knowledge integration establishes processes for ensuring that the outcomes from previous site activities (monitoring data, task results/outcomes, lessons learned, and feedback) are appropriately incorporated into site tools to ensure that planning and decision making are informed by the most up-to-date information.

The BPMD Site requires multiple levels of AM decision making to provide the site team strategic direction, focus CERCLA process implementation on key milestones and results, and help manage change. Two levels of AM decision making will be used at the BPMD Site:

- **Site Principles Management:** As BPMD Site activities progress, the AM decision making process will establish a process for routine review and, as warranted, update of the Site Principles. This decision-making process is discussed in Chapter 3.0.
- **Strategic Planning and Project Planning:** To make progress towards the Site Principles, the AM decision-making process will be applied to project planning. This will include developing Five-Year Strategic Plans and continuously managing activities and schedules for each component of the Site Strategy. This decision-making process is discussed in Chapter 4.0.

The tools that inform BPMD Site AM decision making and the specific reports that document and communicate BPMD Site team decisions are discussed in Chapter 5.0.



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## **2.0 STAKEHOLDERS, ROLES, RESPONSIBILITIES, AND COMMUNICATIONS**

This chapter presents the project team, roles, and responsibilities, and discusses the framework for communication. Due to the large geographic area impacted with contamination, coupled with current, historic, and future land use, BPMD has a multitude of stakeholders. Stakeholders may vary over time and location, and may also vary with specific actions. The stakeholders listed below are considered stakeholders for the EPA-led CERCLA remediation of the BPMD Site. Stakeholders may have additional roles, responsibilities, and actions beyond the scope of the CERCLA remediation process, but this AM SMP addresses the work conducted at the BPMD NPL Site pursuant to CERCLA.

### **2.1 FEDERAL AGENCIES**

The BPMD Site is a mixed ownership site consisting of 48 source areas, located on both private lands and lands managed by the Bureau of Land Management (BLM) or the U.S. Forest Service (USFS). Pursuant to Executive Order 12580, as amended by Executive Order 13016, the President delegated authority to conduct various activities under CERCLA to EPA, the Department of Interior (DOI), and the U.S. Department of Agriculture (USDA). EPA, DOI, and USDA recognize that the coordinated use of authorities and available resources is desirable and may often be necessary to conduct response actions at mixed ownership sites. These general principles facilitate a collaborative approach that is intended to assist in expediting assessments, investigations, cleanups, or other response actions at mixed ownership sites.

To ensure continued, coordinated CERCLA efforts between federal agencies at the BPMD Site, existing Memorandums of Understanding (MOUs) between EPA and USFS—who is delegated CERCLA authority from USDA, and between EPA and BLM—who is delegated CERCLA authority from DOI, are being revised and updated.

#### **2.1.1 U.S. Environmental Protection Agency**

Consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) and Executive Order 12580 Section 9(i), EPA, as the sitewide lead agency, will conduct sitewide activities that may require work on lands managed by multiple parties, as well as response actions involving a release or sole source of release on private lands (i.e., not managed by BLM or USFS). In addition, because the site is on the NPL, pursuant to CERCLA and Executive Order 12580 Section 9(i) and Section 2(e)(1), EPA is delegated authority to address emergency removals and to select long-term remedial actions (RAs) with respect to the release on lands under jurisdiction, custody, or control of BLM or USFS.

EPA is responsible for ensuring all work is consistent with CERCLA and EPA regulations, guidance, and policy, and for sharing information and receiving feedback from the stakeholders (as listed in Section 2.4 of this document).

For those private portions of a site where a responsible party is not under an enforceable agreement to conduct response actions, EPA is responsible for implementing all characterization, design, and construction activities. Where a responsible party is under an enforceable agreement to conduct response actions on private lands, EPA is responsible for overseeing the response actions to ensure they are performed consistent with CERCLA and the relevant enforcement agreement. As appropriate and in accordance with the governing MOUs and the NCP, EPA will collaborate with the Colorado Department of Public Health and Environment (CDPHE), BLM, and USFS as needed to ensure all verified, validated data are shared and available and to ensure all relevant documents are reviewed by each agency.

The federal land management agencies have the authority to conduct response actions involving a release or sole source of release on lands under jurisdiction, custody, or control of BLM or USFS. Accordingly, USFS and/or BLM may exercise its authority under Executive Order 12580, as amended by Executive Order 13016, to carry out removal actions. EPA is the delegated CERCLA authority to make long-term RA decisions on these lands. As such, pursuant to the MOUs, EPA will closely coordinate with USFS and BLM when these agencies are planning for and executing response actions to ensure that proposed actions, to the extent practicable, contribute to the efficient performance of any anticipated long-term RA with respect to the release concerned.

In accordance with the NCP, EPA is responsible for overseeing CDPHE work and ensuring operation and maintenance (O&M) is performed consistent with the selected remedy and O&M plans.

To manage this workload and implement the Site Strategy identified in Chapter 2.0, EPA uses a team of Remedial Project Managers (RPMs) supported by engineers, scientists, legal and technical enforcement staff, and specialists for communications, coordination, and outreach. EPA's BPMD team consists of six workgroups, each managed by an RPM, with leadership and cross-workgroup coordination provided by a lead RPM. The six workgroups and their general roles are listed below:

- **Data Management and Access Workgroup:** This workgroup is responsible for managing all field, laboratory, and digital data for the BPMD Site and for managing the process for gaining access to private land for purposes of CERCLA response actions.
- **Cultural Resources Workgroup:** This workgroup is responsible for ensuring compliance with National Historic Preservation Act (NHPA) requirements, as described in EPA's NHPA standard operating procedure (EPA 2019f), and for coordinating cultural resource data sharing with other agency stakeholders.
- **Communications Workgroup:** This workgroup is responsible for routinely engaging and informing stakeholders and the general public of BPMD activities, planning for and coordinating communications with agency partners, coordinating updates to congressional staff and local elected officials, and coordinating responses to media inquiries as needed.
- **Response Action Workgroup:** This workgroup is responsible for planning, implementing, and coordinating Interim Water Treatment Plant (IWTP) operations and remedial design (RD)/RA (e.g., the 2019 Interim Record of Decision [IROD]) activities (EPA 2019a) at the BPMD Site.
- **Characterization Workgroup:** This workgroup is responsible for planning, implementing, and coordinating EPA-led remedial investigation (RI)/feasibility study (FS) work at the BPMD Site (e.g., the Operable Unit [OU] 3 RI/FS). In addition, this workgroup is responsible for developing and coordinating all EPA long-term monitoring (LTM) and conceptual site model (CSM) efforts.
- **OU2 and Repository Workgroup:** This workgroup is responsible for overseeing the current PRP-led Mayflower Tailing Impoundment Facility RI/FS and for completing a CERCLA decision document for the mine waste repository on this property.

In addition to EPA members of the workgroup, EPA has entered into Interagency Agreements with the U.S. Army Corps of Engineers (USACE) and Cooperative Agreements with the State of Colorado for contract and project management support. EPA, USACE, and the State of Colorado will procure and manage contractors to execute the work identified by the EPA workgroups.

### **2.1.2 Bureau of Land Management**

BLM has the authority to conduct response actions involving a release or sole source of release on lands under their jurisdiction, custody, or control. Accordingly, BLM may exercise its authority, under Executive Order 12580, as amended by Executive Order 13016, to carry out removal actions. At the BPMD Site, this includes lands in the both the Upper Animas River and Cement Creek drainages. EPA is delegated CERCLA authority to make long-term RA decisions on these lands. As such, pursuant to the MOU, BLM will coordinate with EPA when planning for and executing response actions to ensure that proposed removal actions, including O&M of these removal actions, to the extent practicable, contribute to the efficient performance of anticipated long-term RA with respect to the release concerned.

For work being conducted by EPA on private portions of the BPMD Site, BLM will be consulted on CERCLA activities in accordance with the MOU. Similarly, BLM will be consulted on CERCLA O&M activities being conducted by CDPHE. BLM will collaborate with EPA, CDPHE, and USFS as needed to ensure all verified, validated data are shared and available and, as appropriate, ensure all relevant documents are reviewed by each agency.

### **2.1.3 U.S. Forest Service**

USFS has the authority to conduct response actions involving a release or sole source of release on lands under their jurisdiction, custody, or control. Accordingly, USFS may exercise its authority, under Executive Order 12580, as amended by Executive Order 13016, to carry out removal actions. At the BPMD Site, this includes lands in the both the Mineral Creek Watershed and Animas River Canyon below the Town of Silverton. EPA is delegated CERCLA authority to make long-term RA decisions on these lands. As such, pursuant to the MOU, USFS will coordinate with EPA when planning for and executing response actions to ensure that proposed removal actions, to the extent practicable, contribute to the efficient performance of anticipated long-term RA with respect to the release concerned.

For work being conducted by EPA on private portions of the site, USFS will be consulted on CERCLA activities in accordance with the MOU. Similarly, USFS will be consulted on CERCLA O&M activities being conducted by CDPHE. USFS will collaborate with EPA, CDPHE, and BLM as needed to ensure all verified, validated data are shared and available and, as appropriate, ensure all relevant documents are reviewed by each agency.

## **2.2 STATE AGENCIES**

### **2.2.1 Colorado Department of Public Health and Environment**

CDPHE will provide input to EPA, BLM, and/or USFS on investigation and cleanup activities, have the opportunity to comment on documents prior to release to the public, and participate in planning meetings.

For private portions of the BPMD Site where work is conducted by EPA, CDPHE will assume responsibility for O&M activities at these portions of the site in accordance with CERCLA. For O&M activities, CDPHE will be responsible for executing the activities and coordinating with EPA when assessing remedy performance.

In addition, pursuant to CERCLA, EPA may enter into cooperative agreements with CDPHE to carry out EPA-financed response actions. It is anticipated that these agreements may be used to implement EPA-selected RAs. In these instances, CDPHE will be considered the lead for those response actions and will be responsible for coordinating with EPA, USFS, and BLM on CERCLA action planning and execution.

### **2.2.2 Colorado Division of Reclamation, Mining and Safety**

The Colorado Division of Reclamation, Mining and Safety (DRMS) provides technical support, field reconnaissance activities, and interim RA support for state-led actions through cooperative agreements with EPA.

## **2.3 POTENTIALLY RESPONSIBLE PARTIES**

EPA operates under an enforcement-first policy at Superfund sites. In accordance with this policy, EPA will seek to have PRPs conduct response actions, where appropriate, pursuant to an enforcement document (i.e., Administrative Order on Consent, Unilateral Administrative Order, or Consent Decree). This policy promotes the polluter-pays principle, in which those who cause contamination at a site are responsible for investigation and cleanup. This preserves taxpayer dollars and agency resources to address truly abandoned and orphaned sites. EPA is conducting PRP searches at the BPMD Site to identify PRPs that may be able to conduct response actions or pay for EPA's costs in conducting response actions at the site.

EPA entered into an Administrative Settlement Agreement and Order on Consent with Sunnyside Gold Corporation (SGC) under which SGC is conducting an RI of the Mayflower Tailings Impoundment Facility. In addition, EPA issued a Unilateral Administrative Order to SGC for an RI of the Bonita Peak groundwater system (OU3). Finally, EPA also entered into an Administrative Settlement Agreement and Order on Consent with Eureka Gulch Properties LLC and Ryan Bennett covering a PRP-led removal action at the Ben Franklin Mine source area (OU4) in the Upper Animas drainage area of the BPMD Site, which was completed in 2019.

As work continues at the BPMD Site, EPA may enter into additional enforcement agreements with the above identified or additional PRPs to execute work at the site.

## **2.4 PRIMARY STAKEHOLDERS**

BPMD has a multitude of stakeholders. Those listed below represent the current stakeholders for the BPMD Site. Stakeholders may have additional roles and responsibilities outside the scope of the CERCLA process, but those roles and responsibilities are not discussed in this document.

### **2.4.1 Bonita Peak Mining District Silverton Planning Group**

The BPMD Silverton Planning Group (SPG) is designated by the Town of Silverton and San Juan County, Colorado, to represent their jurisdiction when interacting with federal and state agencies. SPG is comprised of local officials and other representatives of the community and provides the local community a mechanism for providing project-related input and feedback.

SPG is a long-term advisory group who will attend in-person and teleconference coordination calls with federal and state agencies to discuss planned and current site work and issues specific to San Juan County. In accordance with the decision-making logic in Chapter 4.0 and the Community Involvement Plan (CIP), formal input and feedback from SPG will be requested by EPA in accordance with planning efforts, proposed remedies, five-year reviews, and other key documents.

### **2.4.2 Community Advisory Group**

A Community Advisory Group (CAG) is an independent group that serves as an informational conduit between diverse community interests, EPA, and state and other federal partners. Its purpose is to provide a public forum for community members to present and discuss their needs and concerns related to the Superfund decision-making process. CAGs can assist EPA in making better decisions on how to clean up

a site and offer EPA a unique insight to community preferences for cleanup and remediation. While a CAG is strictly an advisory group, it serves as an official, long-term mechanism for local citizens to engage with EPA and its partnering agencies.

The BPMD CAG was formed at the beginning of 2019 and includes representatives from citizen organizations from the Animas River basin. This group is designed to serve as the focal point for information exchange among the Town of Silverton, local downstream communities, EPA, the State, and other federal agencies involved in the CERCLA process at the BPMD Site. The BPMD CAG focuses on CERCLA activities impacting the Animas River within Colorado. A primary objective of the BPMD CAG is to disseminate information about activities at the BPMD Site to the community and to provide input to EPA, USFS, BLM, and CDPHE on site activities. The BPMD CAG utilizes local expertise in reviewing and commenting on technical documents associated with the BPMD Site. The BPMD CAG maintains a website with additional information at <https://www.bonitapeakcag.org/>.

In accordance with the decision-making logic in Chapter 4.0 and the CIP, format input and feedback will be requested by EPA in accordance with annual and five-year planning efforts, proposed remedies, five-year reviews, and other key documents.

### **2.4.3 Southern Ute Indian Tribe**

The Southern Ute Indian Tribe (SUIT) is a sovereign nation located on the Southern Ute Indian Reservation in Southwest Colorado. The reservation covers 1,059 square miles in three counties (La Plata, Archuleta, and Montezuma). The SUIT are stakeholders for BPMD investigation and cleanup and have historic and contemporary interests and uses in the BPMD area.

EPA is committed to effective consultation with the SUIT. The SUIT is informed and consulted on response actions at the BPMD Site. To support continued information sharing, EPA has developed a Communications Plan to facilitate effective communication, input, feedback, and information sharing (EPA 2019b).

### **2.4.4 Ute Mountain Ute Tribe**

The Ute Mountain Ute Tribe is a sovereign nation located in Colorado, New Mexico, and Utah. The Ute Mountain Ute Reservation comprises 597,288 acres of allotted and deeded lands. In Colorado, the reservation is primarily in Montezuma County, which is adjacent to La Plata County. The Ute Mountain Ute Tribe are stakeholders for BPMD investigation and cleanup and have historic and contemporary interests and uses in the BPMD area.

EPA is committed to effective consultation with the Tribe. The Ute Mountain Ute Tribe is informed and consulted on response actions at the BPMD Site.

### **2.4.5 Downstream States and Tribes**

The Navajo Nation is a sovereign nation and downstream user of the San Juan River, of which the Animas River is a primary tributary. The Navajo Nation comprises over 17 million acres across northeastern Arizona, southeastern Utah, and northwestern New Mexico. The closest downstream border of the Navajo Nation is approximately 110 miles from the BPMD Site. The Navajo Nation is located within the jurisdiction of EPA Region 9, whereas BPMD is located within the jurisdiction of EPA Region 8. Regions 8 and 9 will coordinate engagement with the Navajo Nation in accordance with the Communications Plan that is currently in development.



The State of New Mexico is located approximately 70 miles south of the BPMD Site and is a downstream user of the Animas River. New Mexico is within the jurisdiction of EPA Region 6. Regions 6 and 8 will coordinate regarding the scope and frequency of engagement with New Mexico.

The Animas River flows into the San Juan River near Farmington, New Mexico. The San Juan River eventually flows to the State of Utah approximately 60 miles from Farmington. EPA will coordinate with the State of Utah through annual meetings to update the Utah Department of Environmental Quality on progress made and future plans. The State of Utah is also included in monthly BPMD newsletters and fact sheets.

#### **2.4.6 Community Stakeholders**

Residents of the Animas Watershed and interested organizations are stakeholders and may obtain information about the remediation of the BPMD Site via EPA updates and reports, SPG/CAG meetings, or related sources by reviewing the EPA website for these documents. Community input is welcome and encouraged. The CIP provides a list of stakeholder organizations and information regarding how citizens may be involved (CDM Smith 2017).

### **2.5 COMMUNICATIONS**

EPA will be the primary coordinator of communications regarding the CERCLA remediation activities at the BPMD Site. EPA will coordinate meetings and related outreach events. The EPA Community Involvement Coordinator and RPMs will be the primary points of contact.

EPA's primary methods for broad communications will be updates provided to SPG and CAG meetings, EPA's Monthly Updates, EPA Fact Sheets, and EPA's BPMD website—[www.epa.gov/superfund/bonita-peak](http://www.epa.gov/superfund/bonita-peak). Communications will be conducted in general accordance with the CIP (CDM Smith 2017).

Communications specific to decision making are outlined in Chapter 4.0.

### 3.0 SITE PRINCIPLES

Site Principles are defined as the goals, objectives, and strategies that provide a basis to guide all EPA work at the BPMD Site. The site goals express what is to be achieved through cleanup actions. The objectives establish more targeted outcomes for different areas of the site based on area-specific conditions and ensure activities taken in that area demonstrate progress towards the site goals. The term ‘Site Strategy’ at the BPMD Site is defined as the high-level approach to focus EPA CERCLA activities throughout the site.

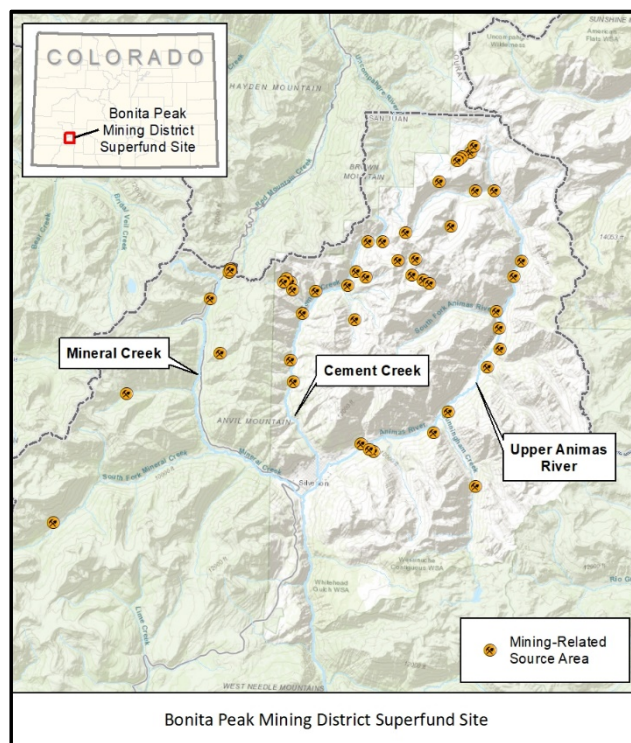
The Site Principles presented in this document reflect EPA’s goals, objectives, and Site Strategy. The other federal agencies, specifically USFS and BLM, have been delegated CERCLA authority and are addressing source areas on federally managed lands within the BPMD Site. The BPMD interagency team will strive to ensure, to the extent practicable, that actions taken by all agencies are consistent with the NCP and align with EPA’s Site Principles.

This chapter briefly describes the site, presents the current Site Principles, and establishes a process for managing the Site Principles in accordance with the AM decision-making process.

#### 3.1 SITE DESCRIPTION

The BPMD Site is centered in southwestern Colorado in San Juan County. Within the site, there are three main drainages (Mineral Creek, Cement Creek, and Upper Animas River), that flow into the Animas River at Silverton, Colorado. From Silverton, the Animas River flows south to Durango, Colorado, then crosses into New Mexico and joins the San Juan River in Farmington, New Mexico.

The three main drainages (Mineral Creek, Cement Creek, and Upper Animas River) within the BPMD Site cover over 140 square miles and contain over 400 abandoned or inactive mines, where large- to small-scale mining operations occurred. The NPL site listing included 48 mining-related sources that were classified as sources or potential sources for contaminated media affecting the three main drainages (**Figure 3.1**). Each source area contains a combination of one or more of the following: waste rock, tailings, smelter slag, and discharging mine drainage. The site source areas are comprised of 35 mines, 7 tunnels, 4 tailings impoundments, and 2 dispersed campsites (EPA 2016).



**Figure 3.1. BPMD Site Location**

The site is currently organized into four OUs:

- **OU1 (Sitewide):** encompasses the entire BPMD Site.
- **OU2 (Mayflower):** includes Mayflower Tailing Impoundments Numbers 1, 2, 3, and 4 and the Mayflower Mill and Tailings Study Area.

- **OU3 (Bonita Peak groundwater system):** generally includes the saturated and unsaturated workings of the Sunnyside Mine, associated drainage and haulage tunnels, nearby mines not known to be connected to the Sunnyside Mine by workings (e.g., Red and Bonita Mine and Gold King Mine), and the surrounding geographic area that may be hydraulically connected or influenced by current and/or historical releases from or management of these mines.
- **OU4 (Ben Franklin Mine):** located immediately below and east of the confluence of the two headwaters of Eureka Gulch, characterized by rugged, high alpine terrain above timberline. The mine consists of an open adit and an adjacent waste rock pile. In 2019, the landowner and DRMS completed a stope closure project and response action that included buffering adit discharge pH and channeling the discharge to minimize interaction with waste rock.

## 3.2 CURRENT SITE PRINCIPLES

The following subsections present and discuss EPA’s goals, objectives, and strategy for the BPMD Site.

### 3.2.1 Goals

In March 2019, EPA developed their initial goals for the site. Development of site goals considered site conditions; data collected by EPA, other federal and state agencies, and other stakeholders; results of ecological and human health risk assessments; and stakeholder input. This analysis indicated the primary issue at the BPMD Site was water quality impacting benthic macroinvertebrate and fish populations throughout various reaches of the watershed. Therefore, EPA established a primary goal for response work at the site of achieving water quality improvement, with a focus on mine drainage. Additionally, to support improvements in water quality throughout the BPMD Site and to address impacts from legacy mining activities, EPA established two additional goals—stabilize source areas, with a focus on solid media; and minimize unplanned releases.

### 3.2.2 Objectives

For the BPMD Site, improving water quality is EPA’s priority goal and is the focus for establishing measurable objectives.

#### *Water Quality Objectives*

EPA established two objectives specific to water quality improvement:

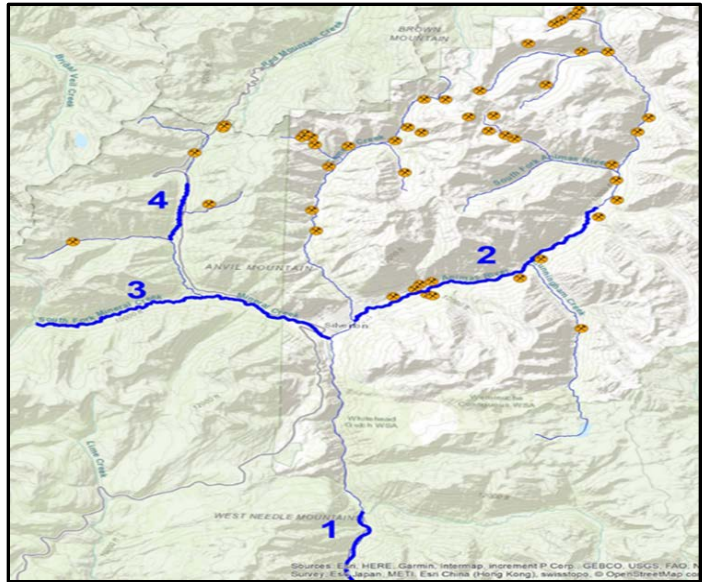
- Identify achievable actions necessary to meet Table Value Standards (TVS) in the Animas River at a location downstream of Elk Creek.
- Improve water quality to meet or exceed State water quality goals in priority reaches.

#### *Priority Reaches*

To focus CERCLA response efforts, EPA established priority reaches at the BPMD Site. Priority reaches were established considering habitat, background impacts, human health and ecological risk, and metals loading into the watershed.

The priority reaches include: (1) Canyon Reach, (2) Upper Animas downstream of Eureka (includes the stretch of the Upper Animas River from Minnie Gulch to Cement Creek), (3) South Fork Mineral Creek (extends from its headwaters to its confluence with Mineral Creek), and (4) Upper Mineral Creek (encompasses Mineral Creek from Mill Creek to Middle Fork Mineral Creek) (**Figure 3.2**).

Priority reach 1 was established to measure improvements in water quality downstream of the former mining district. Therefore, no remediation work will be conducted within the Canyon Reach; instead, water quality improvements within Canyon Reach will result from work conducted at the other metals-loading contributors throughout the BPMD Site.



**Figure 3.2. BPMD Priority Reaches**

Priority reaches 2, 3, and 4 are within the mining district where response actions in these areas would address major metals-loading contributors and improve water quality.

Although not specifically identified as a priority reach, draining adits in Cement Creek are significant contributors to metals loading in the watershed, and Site Strategies will consider this area as a priority or focus for remedial work.

### ***Priority Reach Objectives***

EPA further developed objectives unique to the stream reaches within each priority reach:

- **Priority Reach 1 (Canyon Reach):**
  - Undertake activities necessary to meet TVS in the Animas River at a location below Elk Creek (with the possible exception of aluminum due to high background concentrations).
- **Priority Reach 2 (Upper Animas: Minnie Gulch to Cement Creek):**
  - Improve the number and spatial extent of the existing brook trout fishery.
- **Priority Reach 3 (South Fork of Mineral Creek):**
  - Improve the number and diversity of the existing fishery,
  - Improve the benthic macroinvertebrate community, and
  - Protect/enhance the trout corridor to Animas River.
- **Priority Reach 4 (Upper Mineral Creek):**
  - Investigate the potential for expanding and improving the Mineral Creek fishery, and
  - Improve the benthic macroinvertebrate community.

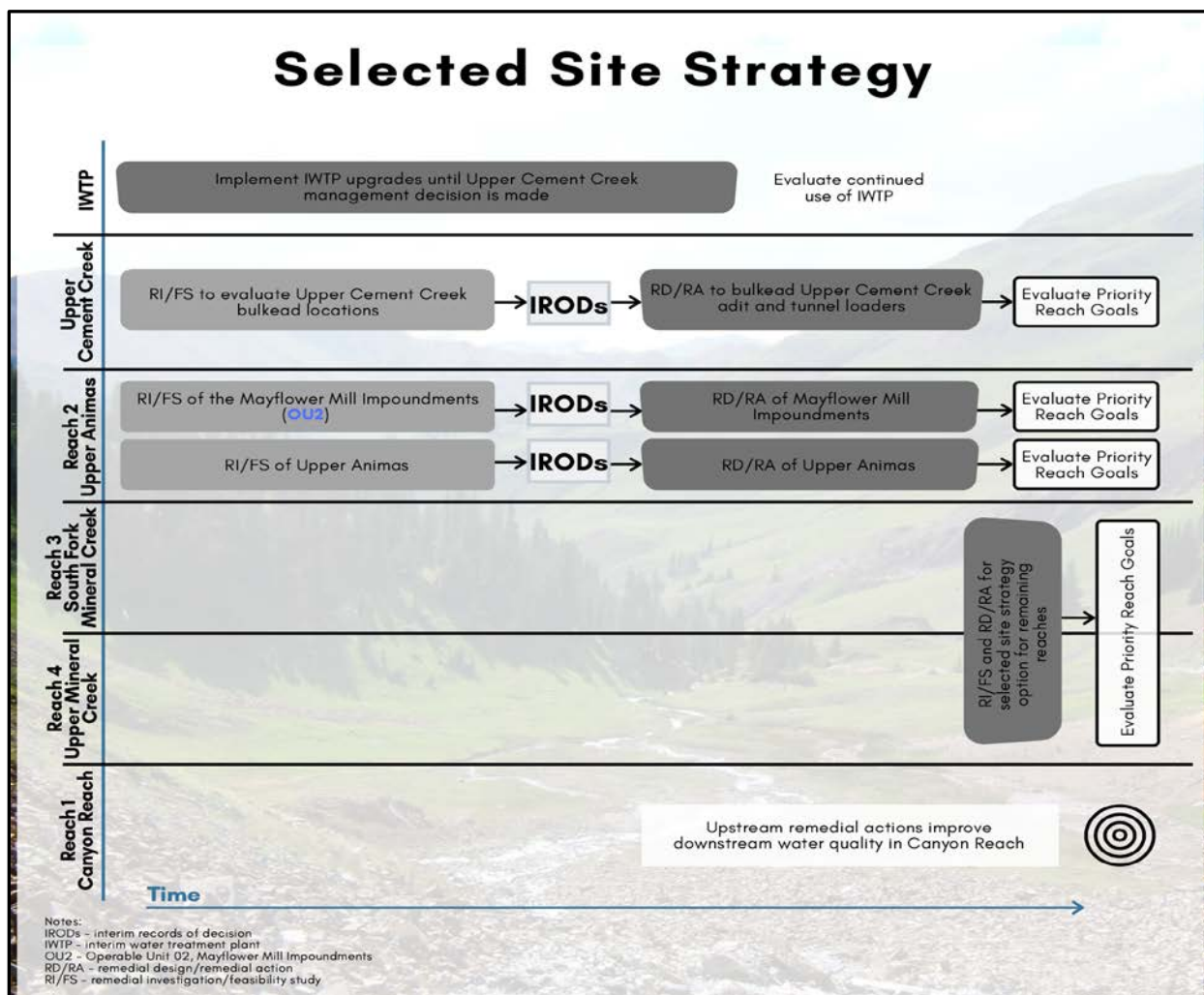


### 3.2.3 Site Strategy

Recognizing that considerable time and resources are required to meet site goals and objectives, the Site Strategy documents how EPA work will be sequenced throughout the BPMD Site to maximize progress towards the three site goals. The Site Strategy was developed by EPA in collaboration with stakeholders during meetings and workshops such as the March 2019 Community Meeting and Open House (EPA 2019c), the November 2019 AM Community Outreach Meeting (EPA 2019d), and the November 2019 AM Site Strategy Workshop, (EPA 2019e).

#### Site Strategy Overview

**Figure 3.3** presents an overview of the selected Site Strategy for the BPMD Site. The Site Strategy, consistent with EPA site goals and objectives, addresses the site by priority reaches, referred to as the “reach by reach” approach. The Site Strategy continues ongoing work at the site, including continued operation of the IWTP, siting and construction of a sitewide repository, continued enforcement actions, and design and construction of the 2019 IROD actions.



**Figure 3.3. Selected Site Strategy for the BPMD Site**

For future actions at the site, the Site Strategy focuses EPA activities on draining adits associated with the Bonita Peak groundwater system (OU3) within Upper Cement Creek and source areas within the Upper Animas drainage (priority reach 2). Both the OU3 and the Upper Animas drainage contain draining adits and source areas that contribute significant amounts of metals to the watershed. Focusing activities on the draining adits in OU3 will help address the Canyon Reach (priority reach 1). Near-term efforts will be focused on conducting concurrent RIs/FSs in both reaches with the purpose of selecting CERCLA remedies.

Prioritizing work in these areas will expedite progress towards improving water quality—the priority site goal, and meeting water quality objectives by reducing metals loading into the Animas River and improving water quality downstream within priority reach 1. In addition, source control actions in both areas will promote long-term remedial solutions to stabilize sources of metals loading (e.g., waste rock and tailings) and to minimize unplanned releases. Finally, prioritizing work in the Upper Animas drainage will promote expansion and improvement of existing trout fisheries, an objective for priority reach 2.

After remedies are selected and implemented in these reaches, working with the State, federal land management agencies, and other stakeholders, as appropriate, EPA will address remaining priority reaches (e.g., priority reaches 3 and 4 within Mineral Creek), mine drainages, and solid media sources at the BPMD Site.

### ***Project Components***

**IWTP:** EPA will continue to operate the IWTP to collect and treat mine discharge from the Gold King Mine while OU3 RI/FS activities are conducted. A final decision on the use of water treatment in OU3 will be made as part of the OU3 proposed remedies.

**Bonita Peak Groundwater System (OU3) RI/FS and RD/RA (Upper Cement Creek):** EPA will conduct a comprehensive RI/FS of the Bonita Peak groundwater system within Upper Cement Creek, with a focus on determining the feasibility of bulkheading draining adits that contribute the greatest metals load to the watershed. Bulkheads may be used when they are practical and effective for improving water quality and minimizing unplanned releases. EPA may also propose the use of other remedial technologies with or instead of bulkheading depending on site conditions and feasibility. RI/FS activities in OU3 are expected to include: characterization of the Bonita Peak groundwater system, analysis of potential bulkhead location(s), treatability studies, analysis of remedy alternatives, public and agency review and comment on the proposed remedies, and EPA remedy selection. Following the RI/FS and remedy selection process, remedies will be designed and constructed. Once operational, remedies will be monitored and assessed to evaluate progress towards site goals and priority reach objectives, and to evaluate technology performance to support potential use at other parts of the BPMD Site.

**Upper Animas RI/FS (Priority Reach 2):** EPA will conduct a comprehensive RI/FS of Upper Animas upstream of the Mayflower Tailing Impoundments Facility (excluding those sources associated with OU3). The RI/FS will focus on selecting remediation approaches that align with site goals and priority reach 2 objectives. RI/FS activities are expected to include: characterization to determine significant contributors to the metals load in the area; treatability studies; analysis of alternatives for significant loading contributors; public, agency, and responsible party review and comment on the proposed remedies; and EPA remedy selection. Following the RI/FS and remedy selection process, remedies will be designed and constructed. Once operational, remedies will be monitored and assessed to evaluate progress towards site goals and priority reach objectives, and to evaluate technology performance to support potential use at other parts of the BPMD Site.

**Mayflower Tailing Impoundment Facility RI/FS (Priority Reach 2):** Concurrent with the EPA Upper Animas RI/FS, EPA will continue oversight of responsible party RI/FS activities at the Mayflower Tailings Impoundment Facility (OU2). RI/FS activities are expected to include: characterization of source areas and



groundwater at the facility; risk assessment; treatability studies; analysis of remedial technologies and alternatives necessary to address contamination at the facility; public, agency, and responsible party review and comment on the proposed remedy; and EPA remedy selection. Following the RI/FS and remedy selection process, remedies will be designed and constructed. Once operational, remedies will be monitored and assessed to evaluate progress towards site goals and priority reach objectives, and to evaluate technology performance to support potential use at other parts of the BPMD Site.

**Waste Repository:** The proposed sitewide repository is undergoing agency review and comment. Once the sitewide repository remedy selection process is complete, the repository will be designed, constructed, and used for managing waste derived from sitewide remedial activities.

**2019 IROD RD/RA:** Remedies selected in the 2019 IROD (EPA 2019a) will be designed and constructed throughout the BPMD Site. Once operational, remedies will be monitored and assessed to evaluate water quality improvements and technology performance to support potential use at other parts of the BPMD Site.

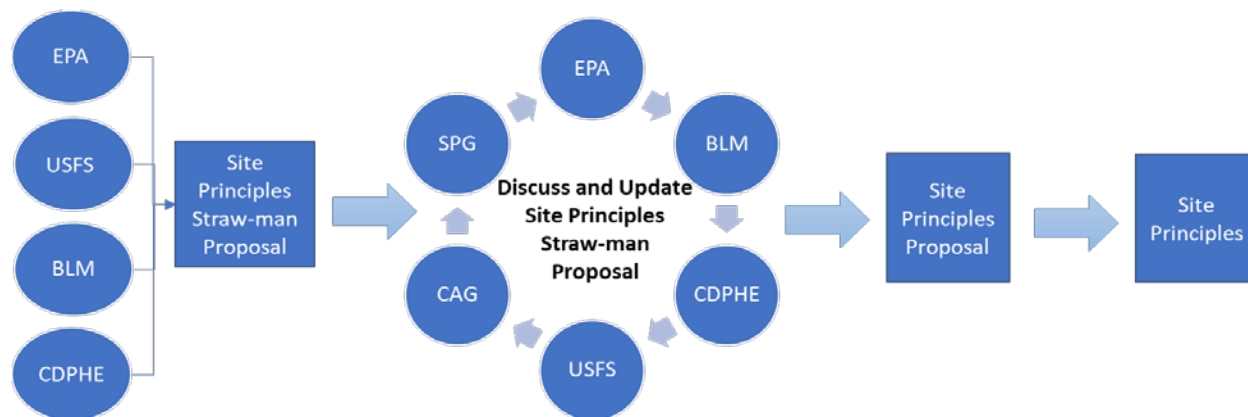
**Prioritize Sites with Potential for Unplanned Releases:** EPA will coordinate with DRMS to complete an inventory of draining mines and source areas in BPMD. EPA will prioritize sites with the greatest need for stabilization or potential for unplanned releases. This inventory will inform the need and timing of future actions.

### 3.3 ADAPTIVE MANAGEMENT DECISION MAKING: SITE PRINCIPLES MANAGEMENT

Specific to Site Principles management, the AM decision-making process is streamlined and focuses on the process under which future Site Principles are developed (Step 1), and how EPA will conduct knowledge integration and document lessons learned to inform future Site Principle development efforts (Step 4).

#### 3.3.1 Step 1: Planning and Prioritization: Site Principles Development

Future development of Site Principles will be led by EPA and performed in accordance with the process outlined in **Figure 3.4**. Under this process, federal and state agencies will develop a Site Principles straw-man proposal outlining potential modifications to site goals and objectives and Site Strategy options. This straw-man will be used to facilitate a discussion with agencies, SPG, CAG, and other stakeholders similar to the process that was used to develop the initial Site Principles in November 2019. Discussion of the straw-man proposal will include identifying the pros and cons for information in the proposal as well as identifying potential modifications (including omissions and additions) to its contents. EPA will review the results of these discussions, presented in an updated Site Principles Proposal, to inform its selection of the Site Principles. This process will be used until the site remediation work is complete.



**Figure 3.4. Site Principles Development**

### **3.3.2 Step 2 and Step 3: Site Strategy Execution, Monitoring, and Assessment**

The Site Strategy will be executed in accordance with the project AM decision-making process, which is identified in Chapter 4.0. Results and impacts of site activities are anticipated to require several years to several decades to observe and confirm; therefore, as part of the agency planning process, EPA, in consultation with other agencies, the State, and stakeholders, will evaluate the need for and timing of a Site Principles review and update.

### **3.3.3 Step 4: Knowledge Integration**

When monitoring and assessment efforts indicate the Site Principles require modification or update, EPA will initiate efforts to develop the next iteration of Site Principles (the process discussed in Step 1). To prepare for this effort, EPA will comprehensively review the existing goals and determine if each goal is still relevant, requires modification, or if site information indicates the need for a new goal. Additionally, EPA will review the status of the current Site Strategy with meeting or making progress towards the water quality and priority reach objectives. EPA will comprehensively examine the site and determine if identified reaches are still priorities, if additional reaches need to be included, and if the objectives are realistic or require modification. This analysis and knowledge integration will support development of the straw-man proposal identified in Step 1.

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## 4.0 ADAPTIVE MANAGEMENT DECISION MAKING: STRATEGIC PLANNING AND PROJECT PLANNING

Due to the size and complexity of the BPMD Site, multiple, concurrent projects are required to implement the Site Strategy, which is identified in Chapter 3.0. Significant project planning and resource prioritization will be required to achieve site goals. To ensure project progress and resources are placed in the area of highest need, AM decision making at the site will include annual and five-year strategic planning in accordance with the iterative, AM decision-making process, which is described in Chapter 1.0. These planning processes, including the process for incorporating stakeholder input, are presented in **Figure 4.1** and discussed below.

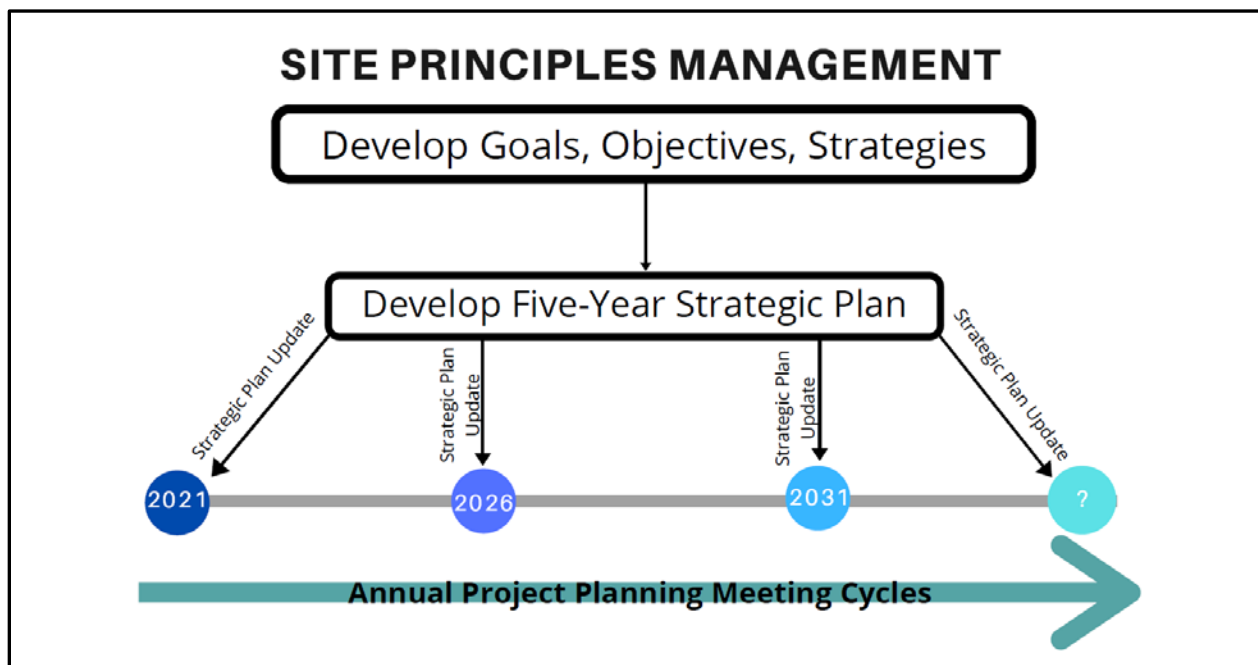


Figure 4.1. Site Principles Management

### 4.1 STRATEGIC PLANNING

The Site Principles identified in Chapter 3.0 include high-level goals and objectives and a Site Strategy that identified a number of priority projects. The purpose of strategic planning is to develop interim milestones with specific timeframes and measurement to guide project planning and to demonstrate progress in advancing the Site Strategy and achieving the objectives and goals for the site. At the BPMD Site, EPA has elected to conduct strategic planning on a five-year basis, referred to as five-year BPMD strategic planning.

Five-year BPMD strategic planning is not an iterative process; rather, it is a comprehensive planning process led by EPA once every 5 years. EPA, in coordination with other federal agencies, the State, and primary stakeholders, will conduct and document strategic planning beginning in fiscal year 2021. The purpose of the strategic plan is to:

- Establish 5-year milestones (e.g., water quality; biological improvements; or CERCLA process milestones, such as deletions), and describe how those milestones will make progress towards site goals and priority reach objectives.

- Identify the types of work the agencies intend to complete during the 5-year timeframe for each component of the Site Strategy (e.g., OU3 RI/FS, IWTP operation, and repository work), and describe how each type of activity will support achieving the 5-year milestone(s).

Each Five-Year BPMD Strategic Plan will include:

- A summary of results from work executed under the previous 5-Year BPMD Strategic Plan, as applicable;
- Established milestone(s) for each site goal and objective;
- Priority actions for each component of the Site Strategy to achieve the milestones; and
- A sequence of activities and a general timeline for completion.

### ***Five-Year BPMD Strategic Plan Development***

To develop each Five-Year BPMD Strategic Plan, an EPA lead RPM will consult with EPA workgroups to develop a high-level list of activities, schedules, and milestones for each major component of the Site Strategy. EPA will request similar information from other federal agencies and the State specific to their projects. Once the information is assembled, EPA, other federal agencies, and the State will evaluate potential opportunities to leverage resources, align work priorities, and ensure milestones are realistic given agency budgets.

The draft Five-Year BPMD Strategic Plan will be sent to SPG, CAG, and other stakeholders for review and feedback. After feedback is received, the plan will be finalized and shared publicly on the BPMD website.

To prepare for the development of subsequent Five-Year BPMD Strategic Plans, EPA will comprehensively assess the successes and challenges with meeting milestones and adhering to schedules in the previous Five-Year BPMD Strategic Plan. This analysis will be documented in the next iteration of the Five-Year BPMD Strategic Plan to help develop milestones and schedules that are realistic, measurable, and can be reasonably met.

### ***Strategic Plan Utilization in Project Planning***

During the Autumn Annual Agency Planning Meeting, as discussed in Section 5.1.1, EPA and the other agencies will conduct a review of the Five-Year BPMD Strategic Plan. If this review indicates that delays in project-specific activities may impact high-level schedules or impact the ability to achieve milestones, the current Five-Year BPMD Strategic Plan will not be updated. Instead, based on this analysis, EPA will identify actions or resources needed to address delays and include this information in Step 1 for future actions.

### ***Project Planning***

BPMD project planning is a continuous and iterative process that follows the four steps of the AM process outlined in Chapter 1.0. **Figure 4.2** summarizes the annual project planning cycle, including stakeholder input, and each step is discussed in more detail below.

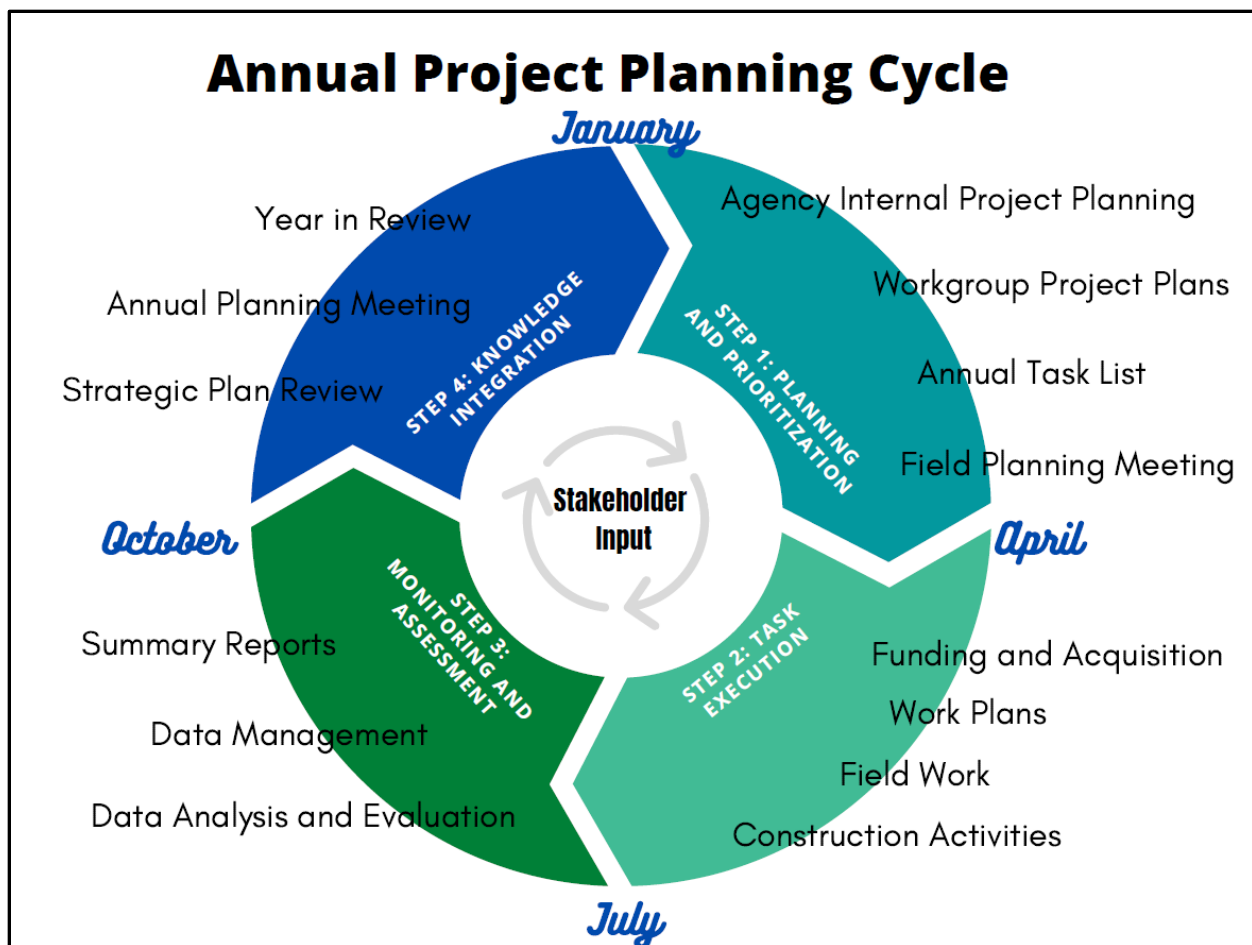


Figure 4.2. BPMD Annual Project Planning Cycle

#### 4.1.1 Step 1: Project Planning and Activity Prioritization

The Site Strategy includes a set of key, high-level CERCLA activities that will be implemented to progress towards site goals. For each of these CERCLA activities, EPA will define a project or set of projects necessary to complete the work. For CERCLA activities conducted by BLM, USFS, or the State of Colorado, they will define a project or set of projects depending on the scope of activities they are implementing. Project planning will be conducted by state and federal agencies on a continuous basis for their lead-project efforts, will be documented in the Annual BPMD Task List, and will be presented in the BPMD site calendar.

##### *Agency Internal Project Planning Process*

Each agency will conduct project planning using their respective defined project-planning process. For each component of the EPA Site Strategy, each EPA workgroup (identified in Chapter 2.0) will develop Workgroup Project Plans (WGPPs) in accordance with the Site Principles and the Five-Year BPMD Strategic Plan.



## ***WGPPs***

EPA WGPPs define the activities, milestones, and schedules for each component of the Five-Year BMPD Strategic Plan. For WGPPs that include sitewide activities, EPA will coordinate, as appropriate, with the other agencies on these sitewide activities. Each EPA WGPP will identify:

- Applicable site goals and priority reach objectives;
- Project definition (scope and measurement of completion);
- Key milestones (including milestones from the Five-Year BMPD Strategic Plan and out-year milestones to support project completion);
- Response activities and planned schedule focused on the next 5 years;
- Contracting and budget information and needs;
- Ongoing or planned enforcement actions; and
- Key project needs specific to data management, access, cultural resources, and communications, which will be captured in consultation with the other BMPD EPA workgroups.

Although not required for USFS and BLM projects, it is encouraged that these federal agencies develop similar plans for their projects.

As the WGPP is a new tool, EPA will focus fiscal year 2020 efforts on completing and populating the initial versions of these plans. The WGPPs will be living documents and will be updated periodically to ensure milestones are realistic and that the planned actions are optimal options for progress towards site goals.

## ***Annual Task List***

In February of each year, EPA will issue an Annual Task List that specifies the tasks planned for that year (the first Task List will be completed in February 2021). A task is a discrete action that will be conducted to make progress on or to assess performance of those CERCLA projects being conducted at a site. For example, a sitewide task may include annual monitoring at targeted locations at the BPMD Site to assess water quality improvements. An example of a project-specific task may be the Red and Bonita head test being conducted at OU3. The Annual BPMD Task List will include:

- A list of tasks and the implementation timeframe for each state, federal agency, and sitewide project or component of the Site Strategy; and
- A summary of any anticipated coordination or outreach activities that will be conducted during that year.

These tasks will be compiled in a tabular format, including the information presented in **Table 4.1**.

**Table 4.1. Example Annual BPMD Task List Entry**

<b>Project</b>	<b>Task</b>	<b>Lead Agency</b>	<b>Anticipated Implementation Timeframe</b>	<b>Outreach Activities</b>
OU3 – RI/FS	Red and Bonita Head Test	EPA	Summer 2020	<ul style="list-style-type: none"> <li>• Discuss initial scope and objectives with CAG and SPG</li> <li>• Provide monthly status updates to CAG and SPG</li> <li>• Share monitoring data via the WQX database</li> </ul>

CAG = Community Advisory Group.

EPA = U.S. Environmental Protection Agency.

FS = Feasibility study.

OU = Operable unit.

RI = Remedial investigation.

SPG = Silverton Planning Group.

WQX = Water Quality Data System.

EPA will lead development of each Annual BPMD Task List. For EPA-led projects, the EPA lead RPM will review each WGPP and, in consultation with the project team, generate a prioritized list of tasks, proposed timeframes, and anticipated outreach activities for the given calendar year. USFS, BLM, and CDPHE, using their own planning processes, will generate a prioritized list of tasks, proposed timeframes, and anticipated outreach activities for each of their projects.

The draft Annual BPMD Task List will be sent to SPG, CAG, and other stakeholders for review and feedback. After feedback is received, the Annual BPMD Task List will be finalized and shared publicly on the BPMD website. In addition, EPA will utilize the web-based BPMD Site Calendar to share information regarding the status of tasks on the Annual BPMD Task List, specifically when activities are planned, in progress, or completed, as well as public participation opportunities at the BPMD Site.

## **4.2 STEP 2: TASK EXECUTION**

After the Annual BPMD Task List has been completed and shared, EPA and the other agencies will implement and execute the tasks. The lead agency is required to secure funding and complete any necessary acquisition activities to begin the work. Funding and acquisition activities will be conducted concurrently with finalizing the task list to complete fieldwork during the summer season. Once these administrative activities have been completed, planning efforts (e.g., work plans, quality management plans, etc.) will be completed before fieldwork can begin. Once fieldwork has been completed, the appropriate reports will be developed, submitted for agency review, and finalized before planning activities begin for the following year. Throughout task planning, execution, and reporting activities, EPA, CDPHE, and other federal agencies will conduct all necessary federal, state, and/or local coordination to implement the task in accordance with the NCP, MOUs, CIP, and the Annual BPMD Task List-planned outreach activities.

## **4.3 STEP 3: MONITOR AND ASSESS**

A key element of AM is monitoring and assessing project tasks against Annual Five-Year Strategic Plan interim milestones, which ultimately inform progress towards objectives and site goals.

As discussed in Step 4, the agencies will use monitoring and assessment information to determine progress towards the 5-year milestones. This will also ensure the most current information is used to select and prioritize future tasks. To ensure success in Step 4, EPA will develop an LTM plan, described in Section 5.4.3, and project-specific monitoring plans that present a comprehensive approach to sampling and monitoring at the BPMD Site. For specific projects, the lead agency will develop data quality objectives (DQOs) for any environmental data to be collected during a CERCLA response action and will document

the DQOs in a Field Sampling Plan (FSP), as discussed in Section 5.4.4. The monitoring activities for each project will be included in the WGPP and identified as specific tasks in the Annual BPMD Task List.

EPA will regularly coordinate with state, other federal agencies, and local community groups, as identified in Chapter 2.0, to provide routine updates on monitoring and assessment activities. In addition, to increase transparency, EPA, the State, and other federal agencies will upload site data into EPA databases (discussed in Chapter 5.0), which will provide platforms for public access and review.

#### **4.4 STEP 4: KNOWLEDGE INTEGRATION**

The foundation of knowledge integration is the update of site tools, including the CSM, loading tool, and risk register, to assist in the process of re-evaluating and reprioritizing future actions. Updating the site tools requires the analysis and evaluation of previous site activities. In preparation of the annual planning meeting, after the field season has been completed and in advance of Annual BPMD Task List development (winter timeframe), EPA, in consultation with CDPHE, USFS, and BLM, will assemble data collected and documents generated during the year and will conduct a preliminary evaluation and analysis of the results. These preliminary results will be incorporated into the year-in-review materials (refer to Section 5.2.5) and will be discussed at meetings to seek feedback from CAG, SPG, and other stakeholders, as deemed appropriate, on the preliminary results and to solicit feedback on the previous year's planning and execution processes to seek opportunities for improvement. Discussing preliminary analysis, evaluating results of previous year actions, and seeking feedback from site stakeholders will help ensure stakeholders understand the basis for any updates to the empirical tools and that community interests are integrated into the next planning cycle.

After the year-in-review activities are completed, EPA will update the empirical tools and the risk register (see Section 5.1.2). The agencies will use the results of the year-in-review analysis and stakeholder feedback to identify project risks that are impacting schedule, scope, and budget; to analyze the root cause of these risks; and to discuss mitigation strategies to address these risks, updating the risk register accordingly.

After these site tools have been updated, each agency will review their project plans and provide the necessary updates. For EPA, this will involve updating each WGPP. At a minimum, updates will include out-year planning to ensure the WGPP has activities and schedules for the next 5 years of work. In addition, EPA will assess the planned activities and determine if and how timing of activities needs to be modified, scope or budget for specific activities needs to be modified, or if additional activities need to be added.

## **5.0 SITE MANAGEMENT TOOLS AND REPORTING**

The AM process relies on a variety of tools to support data-driven decisions to implement actions and remedies. The following sections present and discuss the tools that will be employed to manage work at the BPMD Site.

### **5.1 PLANNING AND MANAGEMENT TOOLS**

This section presents the tools that will be used at the BPMD Site to aid in project planning and management.

#### **5.1.1 Meetings**

EPA utilizes a series of standing meetings to plan and manage work at the BPMD Site. Each meeting is discussed below.

##### ***Annual Agency Planning Meetings***

Annual Agency Planning Meetings are held each autumn. These meetings include EPA, USACE, BLM, USFS, CDPHE, DRMS, and agency contractors as needed. The purposes of the meeting are to:

- review data from current year activities, discuss lessons learned, and update relevant site tools (knowledge integration);
- review the current Five-Year BPMD Strategic Plan and document any major deviations from the plan (strategic planning);
- initiate next year's project planning by discussing each agency's plans for the next year's activities and ensure they align with the Site Principles (Chapter 1.0) and the Five-Year BPMD Strategic Plan (Section 5.1); and
- promote communication among the agencies.

Typical outcomes of this meeting are the preparation of materials for the Year-in-Review Information Forum (Section 5.25), as well as the generation of initial draft tasks for inclusion in the Annual BPMD Task List (Section 4.1.1) for the following year.

##### ***Annual Agency Field Planning Meetings***

Annual Agency Field Planning Meetings are held each spring. These meetings include EPA, USACE, BLM, USFS, CDPHE, and agency contractors as needed. The purposes of the meeting are to:

- discuss upcoming field activities identified in the Annual BPMD Task List (Section 4.1.1);
- coordinate access needs, document review, data collection activities, and quality assurance requirements, and discuss work schedules and outreach needed; and
- promote communication among the agencies.

### ***Monthly Agency Meetings***

Monthly agency meetings include EPA, BLM, USFS, CDPHE, and agency contractors as needed. The purposes of these meetings are to:

- promote communication within the team,
- provide opportunity for workgroups to provide updates on Annual BPMD Task List activities,
- review community concerns, and
- discuss and coordinate materials for upcoming community outreach (e.g., monthly meetings and public meetings).

### ***Monthly Interagency Leadership Team Meetings***

Monthly interagency leadership team meetings provide a forum for agency project managers to:

- discuss project progress, and
- discuss site or management issues with a focus on timely resolution.

### ***Monthly Interagency Management Meetings***

Monthly calls are held between middle managers at BLM, USFS, EPA, and CDPHE to:

- discuss ongoing site challenges,
- resolve issues, and
- encourage interagency coordination at management and staff levels.

## **5.1.2 Risk Register**

EPA, with input from other federal agencies and the State, has developed a sitewide risk register to document key project risks at the BPMD Site and to identify potential actions to manage each risk. Risk registers are a common project management tool used to identify potential project risks and mitigation strategies. Project risks may include events that delay schedule, denied access to private property to conduct fieldwork, lack of resources, or insufficient data for decision-making purposes. Typical risk registers include a description of the risk; probability of occurrence; potential impacts to project scope, schedule, or budget; and mitigation strategies. . EPA manages the risk register on its SharePoint site. The risk register will evolve as the Site Strategy progresses and will be updated and revised as risks are identified and addressed. The risk register is a project tool that will be updated as part of knowledge integration efforts that will be conducted at the Annual Agency Planning Meetings.

## **5.2 COMMUNICATION TOOLS**

This section presents the tools that will be used at the BPMD Site to facilitate communication among the project teams and stakeholders.

### **5.2.1 Bonita Peak Mining District Calendar**

EPA uses a web-based BPMD Site Calendar to share information regarding the status of tasks on the Annual BPMD Task List, specifically when activities are planned, in progress, or completed, as well as public participation opportunities at the BPMD Site. This communication and planning tool is available to the public on the EPA BPMD website. The BPMD Site Calendar will be regularly updated by EPA, USFS, BLM, and CDPHE to maintain relevant current information.

### **5.2.2 Community Involvement Plan**

In 2017, EPA released a CIP (CDM Smith 2017) that details how EPA and stakeholder agencies engage and inform community members, environmental groups, government officials, the media, and other interested parties in the investigation and cleanup activities at the BPMD Site. The CIP was crafted with input and ideas from residents, local groups, and community organizations. EPA is committed to working in a positive way with local communities and residents, and the CIP is a tool used to encourage community stakeholder engagement. In general, most community involvement activities are carried out in partnership with agency stakeholders.

The CIP serves as a reference document for the community and details where current information may be found, lists points of contact, discusses how to provide input, and discusses the various partnerships involved with cleanup activities. The CIP will be used as a tool to educate, inform, and collaborate with community stakeholders. The CIP is produced by EPA and will be updated as needed or required by CERCLA and the NCP.

### **5.2.3 Southern Ute Indian Tribe Communication Plan**

In 2016, EPA finalized a Communications Plan with the SUIT to facilitate communications. The plan was subsequently revised three times, and the most recent version was finalized in July 2019 (EPA 2019b). The plan recognizes that the BPMD Site contains areas in which the SUIT has had historic and contemporary interests and uses. EPA desires to conduct investigative and response activities in a manner that is sensitive to the needs and customs of the SUIT. The plan describes the types of activities EPA anticipates performing, as well as communication methods and contacts for the parties involved. EPA will consult the plan as it conducts its work at the BPMD Site. EPA intends to review the plan on an annual basis and to ask the SUIT for its input on the effectiveness of the plan and any changes Tribal representatives might like to see.

### **5.2.4 Navajo Nation Communication Plan**

The Navajo Nation Communication Plan is currently in development and includes details and procedures for facilitating communication with the Navajo Nation. The plan will describe the types of activities EPA anticipates performing, as well as communication methods and contacts for the parties involved. EPA will consult the plan as it conducts its work at the BPMD Site. EPA intends to review the plan on an annual basis and to ask the Navajo Nation for its input on the effectiveness of the plan and any changes they might like to see.

### **5.2.5 Year-in-Review Information Forum**

EPA, CDPHE, USFS, and BLM will participate in a year-in-review public meeting in the Town of Silverton to discuss what was accomplished, preliminary results (if available), and lessons learned. EPA will solicit feedback on the previous year's planning and execution processes to seek opportunities for improvement.



The year-in-review presentation will be prepared in Microsoft PowerPoint (or similar) and presented at a public meeting with hardcopy printouts. In addition, the presentation will be posted on the BPMD website for public access.

### **5.2.6 Monthly Newsletter and Fact Sheets**

Each month, EPA prepares newsletters to summarize ongoing, completed, and planned activities and to provide general updates. Newsletters are provided directly to select stakeholders and are available to the public via the BPMD website. In addition, EPA periodically prepares fact sheets to present information regarding current activities. For example, in July 2020, EPA released a fact sheet for the BPMD Sitewide Repository Proposed Plan to provide information regarding proposed actions and opportunities for public comment. EPA will continue to produce and distribute fact sheets, as needed, to disseminate pertinent information.

## **5.3 DATA MANAGEMENT TOOLS**

This section presents the tools used at the BPMD Site to aid in data management, data evaluation, and data presentation.

### **5.3.1 U.S. Environmental Protection Agency SharePoint Site**

EPA maintains an internal, web-based SharePoint site as a repository for draft documents, final documents, references, and working files. The site is used to promote internal collaboration and to enable a single access point for project documents.

### **5.3.2 Scribe**

EPA uses Scribe as a repository for all project analytical data. The Scribe database is updated by EPA with input from other agencies as needed. The database is available to EPA, federal agencies, and limited external stakeholders for access to project data. Data queries from Scribe are typically used for communications, meetings, and related project planning. The Scribe database is used by EPA in conjunction with a Geographic Information System Viewer to review sample locations and results. In addition, a program called Qlik is used to sort, group, tag, and manage the database and to produce outputs for internal and external end-users.

### **5.3.3 Water Quality Data System and StoryMaps**

EPA is currently in the process of updating the Water Quality Data System (WQX) with select data sets maintained in Scribe. WQX is a data-sharing platform currently being used by the removal program and is accessible to the public. ArcGIS StoryMaps is another data-sharing platform that is being evaluated by EPA as an additional avenue to enable public access and evaluation of analytical data. EPA will provide updates to stakeholders and the public regarding the use of WQX and/or StoryMaps as more information is collected and evaluated.

## **5.4 CHARACTERIZATION TOOLS**

This section presents the tools used at the BPMD Site to aid and facilitate technical site characterization and RD/RA.

#### **5.4.1 Quality Assurance Project Plan**

EPA has developed a sitewide Quality Assurance Project Plan (QAPP) for all investigative sampling activities at the site. The QAPP was developed in accordance with the *Uniform Federal Policy for Quality Assurance Project Plans, Evaluating, Assessing, and Documenting Environmental Data Collection and Use Programs, Part 1: UFP-QAPP Manual* (EPA 2005); is compliant with the *EPA Requirements for Quality Assurance Project Plans, EPA QA/R-5* (EPA 2001); and is intended for use by all agencies, under which FSPs will be prepared for individual sampling events.

The sitewide QAPP describes the necessary quality assurance, quality control, and other technical activities that must be implemented to ensure that the results of the work performed will satisfy the stated performance criteria. The sitewide QAPP is maintained on the EPA SharePoint site and is updated annually as needed.

#### **5.4.2 Data Management Plan**

EPA has developed a Data Management Plan (DMP) that provides guidance and project requirements and responsibilities needed to manage and use environmental information.

The DMP includes details on the data management team organization, types of data that may be collected at the site, and how field and laboratory data will be managed. The DMP is maintained on the EPA SharePoint site and is updated annually as needed.

#### **5.4.3 Sitewide Long-Term Monitoring Plan**

EPA is in the process of developing an LTM Plan. The goals of the LTM Plan are to collect data to support ongoing evaluation of site goals, to document progress towards site goals over time, and to provide data relative to the following objectives:

- Assess long-term status and trends of contaminants in site media.
- Evaluate the performance and effectiveness of pilot projects and interim and final RAs.
- Evaluate progress toward RA objectives and cleanup benchmarks.
- Provide data for CERCLA-required five-year reviews of the progress on remedy implementation.
- Improve understanding of the BPMD Site processes and variability to optimize subsequent RA implementation.

#### **5.4.4 Field Sampling Plans**

Prior to conducting field sampling events, the lead agency will develop an FSP. These FSPs will reference, and be consistent with, the QAPP and DMP. These plans will document the objective of data collection, what questions the data are expected to answer, what data will be collected, a schedule for collection, expected outcomes of any performance data, and what project tool(s) will be updated by the data collected during this project.

### **5.4.5 Conceptual Site Model**

EPA is developing a CSM to represent the evolving understanding of the BPMD Site based on current knowledge. CSMs may be developed for individual source areas, source areas within portions of drainages or across entire drainages, or for the entire site as needed to facilitate understanding and decision making. In general, the CSM:

- Identifies potential exposure pathways, including relationships between sources, source areas, transport mechanisms, exposure routes, and receptors.
- Helps determine the necessity and scope of any further investigations.
- Aids in evaluating exposure pathway completeness.
- Provides a concise description of contaminant transport and deposition mechanisms, including key sources and sinks.

The CSM will be a living tool to aid decision-makers in designing, implementing, and assessing RAs to address human health and ecological risks with a high level of certainty and success. Updates to the CSM will be made as pertinent studies and activities are completed and will continue throughout the project.

### **5.4.6 Loading Tool**

EPA developed and continues to update a method to calculate and evaluate metals loading across the BPMD Site. The loading tool compiles both reach and adit metals loads in a single mathematical summation tool, with a graphical front-end interface that is easy for end-users to use, and predicts metals reduction from various actions taken at the BPMD Site. Currently, the loading tool includes several contaminants of concern including zinc, cadmium, copper, aluminum, manganese, and lead. The loading tool is updated annually, assists the project team with identifying reaches and source areas with significant metals contributions, and is useful for RI/FS, RD, and RA planning.

## **5.5 REPORTING**

This section briefly summarizes the types of reporting that EPA and the project team will conduct at the BPMD Site. Several reports are prepared throughout the year to update stakeholders, summarize findings of field investigation activities, and provide routine updates of ongoing activities and documents that are required as part of the Superfund process. Reporting may include, but not be limited to:

- monthly newsletters and fact sheets,
- investigation sampling and analyses reports,
- RI and treatability study reports, and
- RA completion reports.

## 6.0 REFERENCES

CDM Smith 2017. *Bonita Peak Mining District Superfund Site Community Involvement Plan*. Prepared for U.S. Environmental Protection Agency, Colorado Department of Public Health and Environment, U.S. Forest Service, and Bureau of Land Management. Final. August.

EPA (U.S. Environmental Protection Agency) 2001. *EPA Requirements for Quality Assurance Project Plans, EPA QA/R-5*. Office of Environmental Operations. EPA publication number EPA/240/B-01/003. March.

EPA 2005. *Uniform Federal Policy for Quality Assurance Project Plans, Evaluating, Assessing, and Documenting Environmental Data Collection and Use Programs, Part 1: UFP-QAPP Manual, Version 1*. Intergovernmental Data Quality Task Force. EPA publication number EPA-505-B-04-900A, DoD publication number DTIC ADA 427785, Final. March.

EPA 2016. *National Priorities List: Bonita Peak Mining District, San Juan County, Colorado*. September.

EPA 2019a. *Interim Record of Decision for Bonita Peak Mining District Superfund Site, Operable Unit 1, San Juan County, Colorado*. May.

EPA 2019b. *Southern Ute Indian Tribe Communications Plan: For facilitating communication between the U.S. Environmental Protection Agency and the Southern Ute Indian Tribe at the Bonita Peak Mining District Site, Colorado*. July.

EPA 2019c. *Community Outreach Meeting, Bonita Peak Mining District, Adaptive Management Pilot Program*. July.

EPA 2019d. *Community Outreach Meeting, Bonita Peak Mining District, Adaptive Management Pilot Program*. November.

EPA 2019e. *Bonita Peak Mining District Adaptive Management Site Strategy Workshop*. November.

EPA 2019f. *Site-Wide Operating Procedure: Compliance with the National Historic Preservation Act at the Bonita Peak Mining District Superfund Site*. Region 8. Available at: <https://semspub.epa.gov/work/08/100006709.pdf>.

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## ORDINANCE NO. 2020-01

### **AN ORDINANCE OF THE BOARD OF COUNTY COMMISSIONERS OF SAN JUAN COUNTY, COLORADO FOR THE REGULATION OF LAND USE, DEVELOPMENT AND ACTIVITIES UPON ANY PROPERTY WITHIN UNINCORPORATED SAN JUAN COUNTY CONTAINING MINE WASTE SOURCE AREAS WHERE RESIDUAL MINE WASTES AND REMEDIATION COMPONENTS EXIST, SPECIFICALLY INCLUDING THE BONITA PEAK MINING DISTRICT SUPERFUND SITE**

**WHEREAS**, San Juan County (the “County”) has jurisdiction over Mine Waste Source Areas, as defined herein, where residual mine wastes and remediation components exist, and the Board of County Commissioners adopts this Ordinance to control and regulate land use at all such Mine Waste Source Areas within unincorporated San Juan County, specifically including, but not limited to, the Bonita Peak Mining District Superfund site, pursuant to authority granted in C.R.S. § 29-20-104 and C.R.S. § 30-11-101, *et seq.*; and

**WHEREAS**, the United States Environmental Protection Agency (“EPA”) and the Colorado Department of Public Health and Environment (“CDPHE”) have and will conduct Comprehensive Environmental Response, Compensation, and Liability Act (“CERCLA”) response actions including, but not limited to, response actions selected in the Interim Record of Decision dated May 20, 2019 (“IROD”) and possible other future CERCLA response actions, at portions of the Bonita Peak Mining District Superfund Site (collectively referred to as “CERCLA response actions”), in San Juan County; and

**WHEREAS**, properties where CERCLA response actions have occurred within the Bonita Peak Mining District (“BPMD” or “Site”) are more fully described in the inventory of Remediated Mine Waste Source Areas, **attached hereto as Attachment A** (“Inventory”), and as may be modified from time to time and maintained within the Office of the San Juan County Clerk and Recorder for public viewing. Specifically, the subject CERCLA response actions may include: managing acidic water discharging from mine portals with diversion trenches; diverting storm water around mine waste piles; maintaining existing mine portal sediment ponds; excavating in-stream mine wastes; and containing and isolating contaminated soils at mine-impacted recreation staging areas using covers; and

**WHEREAS**, prior to the BPMD Superfund site listing, non-CERCLA reclamation measures were implemented on other Mine Waste Source Areas in San Juan County within and beyond the BPMD. These sites may be more fully described in the Inventory, as may be modified from time to time and maintained within the Office of the San Juan County Clerk and Recorder for public viewing. Specifically, the subject non-CERCLA reclamation measures may include: managing acidic water discharging from mine portals with diversion trenches; diverting storm water around mine waste piles; maintaining existing mine portal sediment ponds; excavating in-stream mine wastes; and containing and isolating contaminated soils at mine impacted recreation staging areas using covers; and



**WHEREAS**, although the CERCLA response actions are conducted to protect human health and the environment in accordance with the National Contingency Plan (40 C.F.R. Part 300), residual mine waste will remain at many of the BPMD Remediated Mine Waste Source Areas, including all of the IROD Mine Waste Source Areas. Likewise, residual mine waste remains at the non-CERCLA Remediated Mine Waste Source Areas. Contact with residual mine waste could result in unacceptable human exposure to lead and arsenic; and

**WHEREAS**, the CERCLA response actions and non-CERCLA reclamation measures include engineered components such as diversion trenches, sediment ponds and covers that will not function as intended if disturbed; and

**WHEREAS**, the Colorado Environmental Covenants Law, C.R.S. § 25-15-320(2), requires environmental covenants for environmental remediation projects related to remedial decisions made after July 1, 2001, that result in residual contamination levels determined safe for one or more specific uses, but not all uses, or where engineered features or structures are incorporated requiring monitoring, maintenance or operation or that will not function as intended if disturbed. Environmental covenants are only required for remedial decisions made pursuant to the: Resource Conservation and Recovery Act, 42 U.S.C. §§ 6921-6939e, 6972, 6973 and 6991-6991i; CERCLA, 42 U.S.C. § 9601, *et seq.*; Uranium Mill Tailings Radiation Control Act of 1978, 42 U.S.C. § 7901 *et seq.*; Colorado Radiation Act, C.R.S. §§ 25-11-101 to 114 and 301-205; Colorado Hazardous Waste Act, C.R.S. §§ 25-15-310 to 328; and Colorado Solid Waste Disposal Sites and Facilities Act, § 30-20-100.5 *et seq.*; and

**WHEREAS**, BPMD response actions, including those in the IROD, are selected pursuant to CERCLA and after July 1, 2001, thus triggering the requirement for environmental covenants at BPMD Remediated Mine Waste Source Areas. The non-CERCLA remediation measures were not conducted pursuant CERCLA or other statutes listed in the recital above, many of which were completed prior to July 1, 2001, and therefore are not subject to the environmental covenant requirement; and

**WHEREAS**, C.R.S. § 25-15-320(3)(b) authorizes CDPHE to waive the requirement for an environmental covenant for parcels of land where the owner does not grant an environmental covenant under C.R.S. § 25-15-320 and where the County, City, or municipality having jurisdiction over the affected land has enacted an ordinance or resolution imposing the relevant environmental use restrictions, and has entered into an intergovernmental agreement with CDPHE; and

**WHEREAS**, the County finds that this Ordinance is necessary to protect human health and the environment and to maintain remediation measures, including engineered components at the subject CERCLA and non-CERCLA Remediated Mine Waste Source Areas.

**BE IT ORDAINED BY THE BOARD OF COUNTY COMMISSIONERS OF SAN JUAN COUNTY, COLORADO** as follows:

**Section 1. Title.**

This Ordinance shall be known and referred to as the San Juan County and Bonita Peak Mining District Environmental Regulations.

**Section 2. Authority to Promulgate Ordinance.**

The Board of County Commissioners has authority to regulate land use, development and activities in hazardous areas pursuant to C.R.S. § 29-20-104, and to adopt and enforce ordinances and resolutions regarding health, safety and welfare pursuant to C.R.S. § 30-11-101, *et seq.*

**Section 3. Purpose.**

The Board of County Commissioners of San Juan County, Colorado, finds and declares that residual contamination following remediation at Mine Waste Source Areas may pose a threat to the health, safety, and welfare, of the citizens of San Juan County, Colorado. The Board of County Commissioners also finds and declares that the land use restrictions are necessary to protect remediation measures, including engineered components at Remediated Mine Waste Source Areas.

**Section 4. Scope of Ordinance.**

This Ordinance shall apply to all Remediated Mine Waste Source Areas located within unincorporated San Juan County. Remediated Mine Waste Source Areas are hereby defined as any portion of real property upon which mine waste and any remediation components designed to contain, treat, divert, avoid or otherwise address any aspect of such mine waste, are located, either partially or wholly. Remediated Mine Waste Source Areas may be more fully described in the Inventory, and as may be modified from time to time and maintained within the Office of the San Juan County Clerk and Recorder for public viewing. The determination as to whether a specific property is subject to this Ordinance shall be made by the CDPHE and/or the County. This Ordinance is intended to create an additional permitting process applicable to Remediated Mine Waste Source Areas, in addition to any process required by the San Juan County Zoning and Land Use Regulations. Nothing herein shall be construed as limiting the scope or the authority of the San Juan County Zoning and Land Use Regulations, or any other applicable local, state or federal law, rule or regulation.

## **Section 5. Regulation of Land Use Activities.**

### **A. Regulation of Excavation Activities at Remediated Mine Waste Source Areas**

- (1) No excavation, drilling, grading, digging, tilling, or any other soil-disturbing activity is allowed within any Remediated Mine Waste Source Areas containing residual contamination at levels that have been determined to be safe for one or more specific uses, but not all uses, including mine tailings, waste-rock impoundments, or engineered structures or features that require monitoring, maintenance, or operation or that will not function as intended if it is disturbed, except as authorized in a remedial decision document or with the prior written authorization of CDPHE as set forth in this Section 5.

### **B. Remediated Mine Waste Source Area Permit – CDPHE Consult Required**

- (1) Any application to the County for any building permit, zoning, subdivision, planned unit development, use by right, special review use, or any development activity (“Permit application”) that will result in any soil-disturbing activity within the boundary of a Remediated Mine Waste Source Area shall be preceded by an application for consultation with CDPHE.
- (2) CDPHE consultation prior to a County Permit application may be requested by any person having an interest in the property for which a County Permit will be sought. At a minimum, the consultation application must include:
  - (a) A general site plan showing the major details of the proposed development, consisting of the location of building and structures, off-street parking and loading areas, service and refuse areas, means of ingress and egress, major landscaping and screening proposals, and signs and pedestrian areas, or a relevant summary of the development activity proposed to be conducted within the boundaries of the Remediated Mine Waste Source Areas;
  - (b) A time schedule for the proposed development;
  - (c) A plan for maintaining the integrity of any engineered component of the remedial action; and
  - (d) Any other information the applicant believes will support his or her request.
- (3) Prior to proceeding to the CDPHE consultation and County Permit process, any applicant may request a determination as to whether the subject property is within a Remediated Mine Waste Source Area. Upon written request, the CDPHE and the County shall make such a determination within a reasonable period of time. Said time-frame may be impacted by such factors as weather, snowpack, and general access. The applicant, upon

such a request, shall provide a survey plat as well as a corresponding survey staking of the subject site, as may be required by the County and CDPHE. The determination regarding inclusion or exclusion of a specific property is subject to change for reasons including but not limited to changes on the ground, current or proposed remediation measures, and/or the discovery or processing of additional information.

- (4) The following activities shall be exempt from the County Permit and CDPHE authorization processes set forth herein:
  - (a) Operations, inspection and maintenance activities undertaken at a Remediated Mine Waste Source Area by EPA, CDPHE or their duly authorized contractors;
  - (b) Operations, inspection and maintenance activities undertaken at a Remediated Mine Waste Source Area by the County or their designee(s);
  - (c) Any other activity exempted from the provision of this Ordinance pursuant to the joint written consent of the County and a duly authorized representative of CDPHE.

#### **C. CDPHE Consultation Review and Results**

- (1) Within a reasonable time following written submittal of a consultation application to the CDPHE representative, along with the minimum required application information and any additional information requested, the CDPHE representative shall prepare a letter to the County setting forth the position of the CDPIIE as to the permit being sought. The letter shall include either: 1) a denial of authorization to proceed; 2) authorization to proceed with the permit as described in the application; 3) authorization with conditions; or 4) a determination by the CDPHE to participate in the County Permit process, with a final position to be deferred.

#### **D. County Permit Application**

- (1) Following receipt of CDPHE's written authorization, authorization with conditions, or request to participate jointly in the County Permit process, the County shall proceed with processing the application pursuant to the San Juan County Zoning and Land Use Regulations. If CDPHE is participating in the County Permit process prior to issuing authorization, said authorization or denial by CDPHE may be determined at any point during the County Permit process. Final Authorization by CDPHE and final issuance of a County Permit shall authorize CDPHE to review and work with the County Permit recipient to assure no activity disturbs the engineered features of the remediated areas of the property unless authorized in a remedial decision document.

#### **E. No Development without Permit**

- (1) No application for any building permit, zoning, subdivision, planned unit development, use by right, special review use, or any other development activity that will result in any soil-disturbing activity within the boundaries of a Remediated Mine Waste Source Area shall be allowed until such time as the property owner or applicant has secured CDPHE's written authorization and a County Permit, and has fully complied with any conditions set forth in the Permit. The issuance of CDPHE's written authorization shall be a condition precedent to any soil-disturbing activity within the boundaries of a Remediated Mine Waste Source Area.

#### **Section 6. Violations and Penalties.**

**A.** This Ordinance may be enforced pursuant to the provisions of the San Juan County Zoning and Land Use Code and C.R.S. §§ 30-28-124, 124.5, 209 and 209.5. Violation of any provision of this Ordinance, or a Permit issued pursuant to Section 5, shall constitute a violation of the San Juan County Zoning and Land Use Code which shall carry such penalties and entitle the County to seek such remedies as are provided by the San Juan County Zoning and Land Use Code or state law.

**B.** Any person who violates the Ordinance or a Permit Section shall also be guilty of a class 2 petty offense, and, upon conviction thereof, shall be punished by a fine of not more than one thousand (\$1,000) dollars for each separate violation.

**C.** The penalty assessment procedure provided in C.R.S. § 16-2-201 shall be followed for any violation of this Ordinance. Any person found in violation pursuant to subsection (A) of this Section 6 shall be assessed a penalty by the apprehending peace officer or by the County Code Enforcement Officer. The penalty assessment shall be a summons and complaint which:

- (1) identifies the alleged offender by name, address and social security number (if available);
- (2) specifies the offense with which the person is charged;
- (3) states both the applicable maximum one thousand (\$1,000) fine and maximum six (6) months jail sentence (if convicted and sentenced by the Court) and the violator's option to instead voluntarily pay a fine of five hundred (\$500) dollars payable to the County Treasurer; and
- (4) states the requirement that the alleged offender either pay the optional five hundred (\$500) fine to the County Treasurer in person or by mail within fourteen (14) days of the issuance of the penalty assessment or else appear to answer the charge before the County Court at 9:00 a.m. on the date of its next regular session at the San Juan County Courthouse.

Any person who chooses to acknowledge his or her guilt may, within fourteen (14) days of the date of issuance of the penalty assessment, voluntarily pay a fine of five hundred (\$500) to the San Juan County Treasurer either in person or by mail at the address as shown on the penalty assessment. Any such payment shall be accompanied by a copy of the penalty assessment signed by said person acknowledging his or her guilt. Payment of the foregoing fine shall relieve the person receiving the penalty assessment of any further obligation to appear in the County Court to answer the offense charged in the penalty assessment.

**D.** When imposing a fine under this Ordinance, the Court shall separately state, as a part of the total fine, the surcharge specified in C.R.S. § 24-4.2-104(1). The defendant shall also pay Court costs and docket fees.

**E.** Pursuant to C.R.S. § 25-15-322, this Ordinance, and the Intergovernmental Agreement referenced herein, whenever CDPHE and/or the County finds that any person is or has been in violation of any requirement of this Ordinance or a Permit as it relates specifically to property or actions at a Remediated Mine Source Area, CDPHE and/or the County may bring suit in district court for injunctive relief, enforcement of this Ordinance, or a Permit, and recovery of attorneys' fees and costs for any such enforcement action pursuant to C.R.S. § 25-15-322. CDPHE may also issue an administrative order identifying the factual and legal elements of such violation and requiring the person to comply with any such requirements to remedy the violation. All remedies for violations of this Ordinance shall be cumulative.

#### **Section 7. Prosecution.**

All prosecutions pursuant to Section 6(A)-(D), shall be by the 6<sup>th</sup> Judicial District, District Attorney according to the Colorado County Court Rules of Criminal Procedure in the San Juan County Court. The simplified county court procedures set forth in part 1 of article 2 of title 16, C.R.S., shall be applicable to the prosecution of violations of this Ordinance.

#### **Section 8. Severability.**

If a Court of competent jurisdiction shall hold any part of this Ordinance void or unconstitutional, such part shall be deemed severable, and the invalidity thereof shall not affect the remaining provisions of the Ordinance.

#### **Section 9. Disposition of Fines, Fees, and Forfeitures.**

All fines and forfeitures obtained through enforcement actions initiated under Section 6 for violations of the provisions of this Ordinance shall be paid into the treasury of San Juan County upon payment of said fines and forfeitures.

#### **Section 10. Effective Date.**

This Ordinance shall be in full force and effect thirty days after publication of the Notice of Adoption in the *Silverton Standard*.

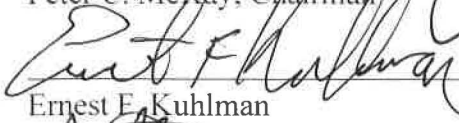
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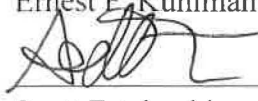


**INTRODUCED, FIRST READING AND ORDERED PUBLISHED IN FULL** this 12<sup>th</sup> day of November, 2020.

**ADOPTED ON SECOND READING AND ORDERED PUBLISHED IN FULL** this 15<sup>th</sup> day of December, 2020.

  
\_\_\_\_\_  
Peter C. McKay, Chairman

  
\_\_\_\_\_  
Ernest E. Kuhlman

  
\_\_\_\_\_  
Scott Fetchenhier

ATTEST:

  
\_\_\_\_\_  
Ladonna Jaramillo

Claim Name	Parcel ID Number	Mineral Survey Number	Patent
A J BRILEY	47770000040003	2600	15955
A P HILL	47750160050027	1922	12437
ACHILLES	48310180010102	2580	17219
ADVENTURE	47750140050004; 47750140050044	14443	36006
ALICE	47750160050027	17371	43397
AMERICAN EAGLE	47750160050013	13270	32580
AMERICAN EAGLE M S	47750160050012	13270	32580
ANGLO SAXON	47750160050028	14875	40966
ANGLO SAXON PLACER	47750310040007	16687	41909
ANIMAS BELLE	47750110050006	4854	17904
ANN HARRIS PLACER (PARCEL C of Sunnyside Gold Corporation - Perino Boundary Adjustment)	48290090010039	11596	28491
AQUILLA	48310180010102	42	1834
BANDORA	48270000030023	7416	23280
BASTILE	47750160050017; 47750160050172; 47750160050173	15680	46082
BELCHER	47750160050013	2044	14878
BEN BUTLER	45690250050006	1291	25653
BEND PLACER	48290090010033	11596	28491
BENJAMIN FRANKLIN	47750140050004; 47750140050044	1011	7817
BERDILLA	47750180040005	1524	11398
BLAIR MOUNTAIN PLACER	48290100010012	16469	43204
BLAIR PLACER (part)	48290090010043	841	7983
BOSTON	45690360050004	54	3294
BREWSTER	47770240040002	15697	36439
BROOKLYN	47750190040007; 47750190040071	18982	298380
BROUILLET	47750310010009	19125	258712
BUENA VISTA	48290000010013	14012	34052
BULLION KING	47770000040003	2604	16060
BURROWS #2	45690360050006	107	3910
BYRON	47730170050013	419	6473
BYRON M S	47730170050010	419	6473
C H MILL SITE	48290090010033	20594	1126475
CARBON LAKE	47770130040019	1177	9128
CATARACT	48270000030023	20459	1050666
CLIPPER	47750140050002	1689	14301
COMET	47750120050005	17034	41816
CONGRESS	47770240040006; 47770240040111	1259	10127
CYNIC	47730170050001	126	2985
DEAN B	47750160050016	16795	40581
DEWITT	45690360050004	52	3271
DOOLEY	47750190040009; 47750200040007	18624	149242
E PLURIBUS	47750090050008	520	6060
EDWARD	47730170050001	210	5944
EUREKA POWER M S	47730190050014	16977	42149
EVENING STAR	47750120050004; 47750120050041; 48290120010111	17034	41816
FAMILY	45690360060002	4801	17907
FATTED CALF	47750100050001	18247	110836
Forest Lily MS	47730080050002	4835	18679
FOREST QUEEN #10	47730310050001	18843	156409
FRANKLIN	45690360050006	1739	11030
GALENA QUEEN	47770130040005; 47770130040053; 47770130040054; 47770130040055; 47770130040056; 47770130040057	2061	15364
GEM	48270040040005	13249	32742
GOLD	48290090010043	14012	34052
GORILLA	47750010010001	17549	43631
GOVERNOR	47750160050027	17371	43397
GOVERNOR	48270040040006	13249	32742
GRAND MOGUL	47750100050009	521	5970
GRAY COPPER	47750090050018	20377	1035597
GREENFIELD	45690360050018	49	3143
H M MILL SITE	48290090010010	20595	1120728
H V B MILL SITE	48290090010043	20594	1126475
HARRISON M S	47750160050028	14710	37311
HERBERT PLACER	47750210050011	13562	35681
HERCULES	47750180040044	18626	139274
HIDDEN HAND	47750140050004; 47750140050045	1658	14262
HIDDEN TREASURE	47750110050121	5010	17563
HIGH JACK	45710300050005	20470	1062852
Howardsville MS	48290020010022	9883	27301
HOWARDSVILLE PLACER (buildable portion)	48290010010091; 48290010010091	942	6908
I X L	47750160050027	1923	37468

## ATTACHMENT A

IRON MASK	47750140050004; 47750140050044	14443	36006
IRON SILVER	47770230040012; 47770230040125	4599	16219
JEANNETTE ROUX PLACER (Tailings Pond Part)	48290090010043	11596	28491
JOHN H FRENCH PLACER	47730310050022	45	2490
JOHN H FRENCH PLACER	47730310050021	45	2490
JUNCTION	47770140040008	19335	365180
JUNCTION #1	47770140040008	19335	365180
JUNCTION #2	47770140040008	19335	365180
JUPITER	47750120050061	17034	41816
KANSAS CITY	47750190040006; 47750190040062; 47750190040065	18494	125561
Katy MS	48290110010001	797	7488
KILLARNEY	47770140040007; 47770140040009	2690	17339
L C M MILL SITE	47750210050006	20726	1131333
LA GARITA	47730060050016; 47730060050161	18221	0
LAST CHANCE	47750140050002	17901	110023
LETTER B	47750160050013	2045	14901
LIBBIE BAUDER EXT	47750160050027	17371	43397
LITTLE MARY	47750140050002	2038	15010
LITTLE TODD	48270000030023	7416	23280
LONDON	45690360050018	5961	22971
LONGFELLOW	47770140040008	5341	17913
LUCKY JACK	45710300050005	17907	45542
M B MILL SITE	48290100010006	20595	1120728
M D THATCHER (PARCEL D of Sunnyside Gold Corporation - Perino Boundary Adjustment)	48290090010040	17699	45664
MAY	47750310010009	19125	258712
MINERAL KING	47750180040005	2051	11816
MORNING STAR	47770230040012; 47770230040124	6793	21105
MORNING STAR	47750120050061	17034	41816
MOUNTAIN QUEEN	47750100050001	792	8979
N N MILL SITE	48290100010006	20595	1120728
NATALIE PLACER	47750280050004	15171	39983
NOBLE	48270000030023	7416	23280
None Such MS	48290020010023	1864	23894
OREGON	47750150050001	17233	42968
ORIENTAL	47770230040012; 47770230040125	16099	39190
ORLEANS M S	47750210050021	15061	38352
PARADOX	47770130040110	19343	377099
PARALLEL	45690350060016	18152	240272
PETER PLACER (PARCEL F of Sunnyside Gold Corporation - Perino Boundary Adjustment)	48290090010042	11596	0
PIEDMONT	48290090010035	15112	37830
POLAR STAR M S (PARCEL E of Sunnyside Gold Corporation - Perino Boundary Adjustment)	48290090010041	7608	0
PRIDE OF THE ROCKIES	47750110050121	7628	31534
PRIDE OF THE WEST	48310190010005	41	2250
QUEEN OF THE WEST	45690360060012	1215	9385
RED CLOUD	45690360050006	120	3909
REGULATOR M S (E of Cunningham Creek)	48310180010030; 48310180010031	154	3295
REPUBLIC	47750140050002	12724	31197
RICHMOND	48310190010005	678	8313
RIVER	48290090010035	15112	37830
ROB ROY	47730170050001	499	7784
ROB THE RANTER	47750090050014	778	8834
ROYAL CHARTER	48290110010004	1710	11359
SALEM	47770130040109	1178	15951
SAMPSON M S	47750160050014	1618	11520
SAN JUAN	48290100010004	15112	37830
SELMA #1	47770130040006	19343	377099
SENATOR	47730190050014	16804	40898
SHAMROCK	47750010010002	17549	43631
SILVER LEDGE	47770230040012; 47770230040122	1523	17456
SILVER PITCHER	47770130040005; 47770130040053; 47770130040054; 47770130040055; 47770130040056; 47770130040057	2062	15365
SPARTA	47770240040003	18626	139274
SUCCESS PLACER	47750160050014	1914	11521
T H W MILL SITE (TRACT A)	48290100010006	20595	1120728
T H W MILL SITE (TRACT B)	48290100010006	20595	1120728
THERESA	47750090050008	15968	40372
THERESA M S	47750090050033	15968	40372
THUNDERBERG	47750140050002	1395	9388
TRACT 41 (PARCEL A of Sunnyside Gold Corporation - Perino Boundary Adjustment)	48290090010037	0	186140

## ATTACHMENT A

TRACT BB (PARCEL B of Sunnyside Gold Corporation - Perino Boundary Adjustment)	48290090010038	0	186140
TRAIL S 500 FT	48310180010030	130	3096
TURKOIS	47770230040128; 47770230040129	1496	9589
VENUS	47750120050061	17034	41816
Vienna Placer	48290110010005	14057	34524
W M G L	47730060050005	19931	898231
WALKYRIE	47730060050005	19931	898231
WASHINGTON	45690250060015	104	4042
WINNING	47770000040121; 47770000040123	11560	29635
YOUNG	47750090050008	16523	39991
ZOO	47770000040121; 47770000040123	11560	29635

**UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF COLORADO**

Civil Action No. \_\_\_\_\_

THE STATE OF COLORADO, THROUGH THE  
COLORADO NATURAL RESOURCES TRUSTEES,

Plaintiff,

v.

SUNNYSIDE GOLD CORPORATION,

Defendant.

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**CONSENT DECREE**

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The State of Colorado (“State”), acting through the Executive Director of the Colorado Department of Public Health and Environment, the Executive Director of the Colorado Department of Natural Resources, and the Attorney General of the State of Colorado, who collectively serve as the Colorado Natural Resources Trustees (“Trustees”) and Sunnyside Gold Corporation (“SGC”), enter into this Consent Decree to resolve SGC’s alleged liability for assessment of and damages for injury to, destruction of, or loss of Natural Resources (as defined below in Section IV) of the State resulting from the release of hazardous substances pursuant to Section 107 of the Comprehensive Environmental Response, Compensation, and Liability Act (“CERCLA”), 42 U.S.C. § 9607.

## I. BACKGROUND

1. Concurrent with the lodging of this Consent Decree, the State has filed a complaint (“Complaint”) against SGC alleging injuries to Natural Resources of the State under the trusteeship of the Trustees resulting from releases of hazardous substances within the Bonita Peak Mining District Superfund Site (“Site”). The State alleges that SGC caused or contributed to releases, which caused acidic, metals-laden mine wastewater to enter the Upper Animas River watershed. The Parties agree that SGC need not file an Answer to the Complaint.

2. SGC does not admit any liability to the State arising out of transactions or occurrences alleged in the complaint.

3. On May 8, 1996, the District Court for the City and County of Denver, State of Colorado, approved and entered a consent decree between SGC and the Colorado Water Quality Control Division, Colorado Department of Public Health and the Environment (“CWQCD”) in *Sunnyside Gold Corporation v. Colorado Water Quality Control Division, Colorado Department of Public Health and the Environment*, No. 94 CV 5459, (“CWQCD 1996 Consent Decree” (as further defined below in Section IV), which resolved litigation related to the State’s Water Quality Control Act, C.R.S. § 25-8-101 *et seq.*

4. Pursuant to a settlement reached in October, 2021, in the MDL Litigation (as defined below in Section IV), agreement on a consent decree has been reached by and among SGC, the State, the United States, and other parties, (“CO-US 2021 Consent Decree”), relating to the Site. This settlement resolved pending litigation for alleged claims and potential claims against SGC under §§ 107(a) and 113(g)(2) of CERCLA for reimbursement of, or contribution towards, response costs incurred or to be incurred for response actions taken or to be taken by the United



States and the State in connection with the release or threatened release of hazardous substances at the Site, but did not resolve and reserved the State's rights with respect to assessment of and damages for injuries to Natural Resources. SGC signed the CO-US 2021 Consent Decree on November 4, 2021, and the State and other parties are in the process of signing it, and it will be lodged before the court presiding over the MDL Litigation after it has been fully signed. SGC and the State expect the CO-US 2021 Consent Decree to be approved and entered, but if that does not occur, then the references to the CO-US 2021 Consent Decree in Paragraphs 18, 18b and 23 shall be null and void.

5. The State and SGC agree, and the Court by entering this Consent Decree finds, that this Consent Decree has been negotiated by the Parties in good faith, that settlement of this matter will avoid prolonged and complicated litigation between the Parties, and this Consent Decree is fair, reasonable, and in the public interest.

THEREFORE, with the consent of the Parties to this Consent Decree, it is ORDERED:

## **II. JURISDICTION**

6. The Court has jurisdiction over the subject matter of this action pursuant to CERCLA §§ 107(a) and 113(b), 42 U.S.C. §§ 9607 and 9613(b), and 28 U.S.C. §§ 1331 and 1345.

7. Solely for the purposes of this Consent Decree, SGC waives all objections and defenses that it may have to subject matter jurisdiction of, personal jurisdiction of, or venue in the Court.

### **III. PARTIES BOUND**

8. This Consent Decree is binding upon the State and upon SGC and its successors and assigns. Any change in ownership or corporate or other legal status, including, but not limited to, any transfer of assets or real or personal property, shall in no way alter the status or responsibilities of SGC under this Consent Decree.

### **IV. DEFINITIONS**

9. Unless otherwise expressly provided in this Consent Decree, terms used in this Consent Decree that are defined in CERCLA or in regulations promulgated at 43 C.F.R. Part 11 and 40 C.F.R. Part 300 and will have the meaning assigned to them in CERCLA or such regulations. All other words will be assigned their normal meaning. Whenever terms listed below are used in this Consent Decree, the following definitions will apply:

“Affiliate” means any entity that, directly or indirectly through one or more intermediaries, controls, is controlled by, or is under common control with, the subject entity or entities;

“CERCLA” means the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. §§ 9601-9675;

“Complaint” has the meaning ascribed in Paragraph 1 in the Background section of this Consent Decree;

“Consent Decree” means this Consent Decree;

“Court” means the United States District Court for the District of Colorado in which the Complaint has been filed, or the court presiding over the MDL Litigation if the proceedings on the Consent Decree are transferred to such court;

“CO-US 2021 Consent Decree” has the meaning ascribed in Paragraph 4 in the Background section of this Consent Decree;

“CWA” means the Federal Water Pollution Control Act, also known as the Clean Water Act, 33 U.S.C. §§ 1251-1387, as amended by the Oil Pollution Act of 1990;

“CWQCD” has the meaning ascribed in Paragraph 3 in the Background section of this Consent Decree;

“CWQCD 1996 Consent Decree” means the Consent Decree approved and entered on May 8, 1996, by the District Court for the City and County of Denver, State of Colorado, between SGC and the CWQCD in *Sunnyside Gold Corporation v. Colorado Water Quality Control Division, Colorado Department of Public Health and the Environment*, No. 94 CV 5459, and its four amendments approved and entered April 14, 1997; January 4, 1999; October 13, 2000; and December 6, 2002, including all appendices thereto;

“Day” means a calendar day. In computing any period of time under this Consent Decree, where the last day would fall on a Saturday, Sunday, or federal or State holiday, the period will run until the close of business of the next working day;

“Effective Date” means 30 Days from the date that the Court enters the Consent Decree, unless an appeal of the entry of judgment is filed during the 30-Day period; if an appeal is taken, the Effective Date means the date on which the Court’s judgment is affirmed;

“Gold King Release” means the August 5, 2015 release of an estimated three million gallons of water from the Gold King Mine Level 7 adit, resulting in acid mine drainage and approximately 880,000 pounds of heavy metals flowing into Cement Creek, a tributary of the Animas River;

“MDL Litigation” means the Multidistrict Litigation matters centralized in the District of New Mexico for pretrial proceedings, pursuant to the Transfer Order by the United States Judicial Panel on Multidistrict Litigation, *In Re: Gold King Mine Release in San Juan County, Colorado, on August 5, 2015*, MDL No. 2824. MDL Litigation includes those matters with individual docket numbers 16-cv-465-WJ-LF; 16-cv-931-WJ-LF; 18-cv-319-WJ; and 18-cv-744-WJ;

“Natural Resource” or “Natural Resources” means land, fish, wildlife, biota, air, water, ground water, drinking water supplies, and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the State;

“Natural Resource Damages” means any and all damages and costs, for purposes of CERCLA §§ 107(f)(1) and 107(a)(4)(C) to “Natural Resources” as defined in CERCLA § 101(16), and for purposes of CWA § 311((f)(4) or (f)(5), 33 U.S.C. § 1321(f)(4) or (f) (5), including any and all damages, costs, expenses and interest that may be recovered by a Natural Resource Trustee pursuant to 43 C.F.R. § 11.15, and any and all damages and costs under similar State laws, including common law claims, for Natural Resources;

“Paragraph” means a portion of this Consent Decree identified by an Arabic numeral;

“Party” or “Parties” means the State of Colorado and/or SGC;

“Section” means a portion of this Consent Decree identified by a Roman numeral;

“SGC” has the meaning ascribed in the initial paragraph of this Consent Decree;

“SGC Related Entity” or “Related Entities” means: (i) SGC’s successors and assigns; (ii) SGC's former or current officers, directors and employees, but only to the extent that the liability of any such person is based on acts and/or omissions which occurred in the scope of the

person's employment or capacity as an officer, director, and employee; (iii) Affiliates of SGC ("SGC Affiliates"), specifically including: Kinross Gold Corporation and Kinross Gold U.S.A., Inc., each of which is an indirect parent company of SGC, and (iv) SGC's Affiliates' successors and assigns;

"Site" means the Bonita Peak Mining District Superfund Site in San Juan County, Colorado, EPA Docket ID No. EPA-HQ-OLEM-2016-0152, as published in the Federal Register on September 9, 2016, 81 Fed. Reg. 62397. The definition for this Site will be construed to include all areas of the Site ever defined or described by the U.S. Environmental Protection Agency ("EPA") in relation to the National Priorities List, 40 C.F.R. Part 300, including any further expansion of such Site as may in the future be determined by EPA;

"State" has the meaning ascribed in the initial paragraph of this Consent Decree; and

"Trustees" has the meaning ascribed in the initial paragraph of this Consent Decree.

## **V. STATEMENT OF PURPOSE**

10. By entering into this Consent Decree, the mutual objective of the Parties is to avoid litigation by resolving SGC's alleged liability for Natural Resource Damages resulting from releases of hazardous substances within the Site. Subject to the terms and conditions herein, this Consent Decree is intended to provide finality and the broadest protection afforded by law to SGC and SGC Related Entities with respect to such alleged liability.

## **VI. PAYMENT OF SETTLEMENT AMOUNT**

11. SGC agrees to pay the State a settlement in the amount of one million, six hundred thousand dollars (\$1,600,000), broken down as follows:

- a. One million, two hundred thousand dollars (\$1,200,000) to settle the State's claims for Natural Resource Damages resulting from the Gold King Release; and
- b. Four hundred thousand dollars (\$400,000) to settle the State's claims for Natural Resource Damages resulting from other releases within the Site.

12. Although the State may file this judgment as, and where necessary to preserve, secured creditor status, SGC acknowledges that such filing is not a condition precedent to the State's secured creditor status. This judgment shall remain in effect until SGC has complied with all requirements in this Consent Decree. Upon approval and entry, this Consent Decree shall constitute the final judgment for resolution of the State's Natural Resource Damage claims against SGC.

13. Payment instructions. Payment pursuant to Paragraph 11 shall be made within thirty (30) Days of the Effective Date. Payments to Colorado shall be made via wire transfer and shall reference "Bonita Peak Mining District and Gold King Release Settlement" and "CDPHE." Wire information is as follows:

Bank Name: Wells Fargo  
Bank Address: 1675 Broadway, Suite 2700, Denver, CO 80202  
Account Name: Treasurer State of Colorado  
Account Number: 4120280912  
ABA for Wires & ACHs: 121000248  
Type of Account: Checking



On the same Day that funds are wired, SGC shall send written notification of the transfer via email and U.S. Mail to:

Colorado Department of Public Health and Environment HMWMD  
Attn: Jennifer Talbert, B2  
4300 Cherry Creek Drive South  
Denver, CO 80246-1530  
jennifer.talbert@state.co.us

#### **VII. EXPENDITURE OF SETTLEMENT FUNDS**

14. Upon deposit, the funds paid to the State pursuant to this Consent Decree shall be used to assess damages and restore, replace, or acquire Natural Resources equivalent to injured resources. The monies in the Fund may not be borrowed or used for any other purposes.

#### **VIII. FAILURE TO COMPLY WITH CONSENT DECREE**

15. If any amounts due under Paragraph 11 are not paid by the required date, interest shall accrue on the unpaid balance through the date of full payment. The rate of interest shall be the rate established in CERCLA § 107(a)(4), 42 U.S.C. § 9607(a)(4).

16. If any amounts due under Paragraph 11 are not paid by the required date, SGC shall be in violation of this Consent Decree and shall pay, as a stipulated penalty, one hundred dollars (\$100) per Day that such payment is late. Stipulated penalties are due and payable within thirty (30) Days of the date of demand for payment by the State. All payments under this Paragraph shall be identified as “stipulated penalties” and made pursuant to the instructions in Paragraph 13. Penalties provided for under this Paragraph shall accrue regardless of whether the State has notified SGC of the violation or made a demand for payment, but need only be paid upon demand. All penalties provided for under this Paragraph shall begin to accrue on the Day

after payment is due and shall continue to accrue through the date of payment. The State may waive all or a portion of any stipulated penalties incurred via written notice to SGC.

#### **IX. COVENANT NOT TO SUE BY STATE**

17. In consideration of the payments that will be made by SGC pursuant to this Consent Decree, and except as specifically provided in Section X (Reservation of Rights by State), the State covenants not to sue or to take administrative action against the SGC or SGC Related Entities under CERCLA § 107 (including §§ 107(a) and 107(f)) or Section 113(f), 42 U.S.C. §§ 9607(a) and (f) or § 9613(f), or under CWA § 311((f)(4) or (f)(5), 33 U.S.C. § 1321(f)(4) or (f) (5), or under similar State laws, including common law claims, for Natural Resource Damages caused by or otherwise relating to or arising from SGC's or a SGC Related Entity's ownership, actions, non-actions or conduct within the Site. This covenant extends to SGC Related Entities only insofar as the liability of such entity, and its successors and assigns, relates to the Site and its capacity as an SGC Related Entity.

#### **X. RESERVATION OF RIGHTS BY STATE**

18. General Reservations. The State reserves all rights against SGC and SGC Related Entities not expressly included in Section IX, subject to the applicable terms and covenants agreed to and provided by the State and CWQCD under the CWQCD 1996 Consent Decree and the CO-US 2021 Consent Decree. Notwithstanding any other provision of this Consent Decree, the covenant not to sue by the State in Section IX shall apply only to matters addressed in that Section and shall not apply to the following:

- a. Claims based on a failure by SGC to satisfy any requirement of this Consent Decree;
- b. The authority of the State to enforce the requirements of the Colorado Hazardous Waste Act, Colo. Rev. Stat. §§ 25-15-101 to -515 or other applicable statutory or common law to seek or obtain relief other than Natural Resource Damages from SGC, subject to the applicable terms and covenants agreed to and provided by the State and CWQCD under the CWQCD 1996 Consent Decree and the CO-US 2021 Consent Decree;
- c. Criminal liability, if any; or
- d. Claims arising from the past, present, or future disposal, release, or threat of a release of a hazardous substance, pollutant, or contaminant not associated with the Site.

#### **XI. COVENANT NOT TO SUE BY SGC**

19. SGC covenants not to sue and agrees not to assert any claims or causes of action against the State (including all employees, agents, contractors, departments, agencies, administrations, and bureaus thereof) related to Natural Resource Damages arising out of a release of a hazardous substance within the Site. The covenant not to sue granted in this Paragraph shall be binding on SGC Related Entities.

#### **XII. EFFECT OF SETTLEMENT**

20. Except as provided in Paragraphs 10, 17, 18, 19, and 21 regarding SGC Related Entities, nothing in this Consent Decree will be construed to create any rights in, or grant any cause of action to, any person or entity not a Party to this Consent Decree. The State and SGC expressly

reserve all rights, defenses, claims, demands, and causes of action they may have with respect to any matter, transaction, or occurrence relating in any way to the Site against any person that is not a Party to this Consent Decree.

21. The Parties agree, and by entering into this Consent Decree, the Court finds, that this Consent Decree constitutes a judicially-approved settlement and entitles the SGC and SGC Related Entities protection from contribution actions or claims as provided by CERCLA § 113(f), 42 U.S.C. § 9613(f), as of the Effective Date for all “matters addressed” in this Consent Decree. The “matters addressed” in this Consent Decree are recovery for Natural Resource Damages for injury to, destruction of, or loss of Natural Resources, including the reasonable costs of assessing such injury, destruction, or loss incurred or to be incurred as a result of releases of hazardous substances within or associated with the Site.

### **XIII. RETENTION OF JURISDICTION**

22. The Court will retain jurisdiction over this matter for the purpose of interpreting and enforcing the terms of this Consent Decree.

### **XIV. INTEGRATION**

23. This Consent Decree constitutes the final, complete, and exclusive agreement and understanding among the Parties with respect to the settlement embodied herein. The Parties expressly acknowledge that there are no other representations, agreements, or understandings related to the settlement other than those expressly contained in this Consent Decree. No other document, nor any representation, inducement, agreement, understanding, or promise constitutes any part of this Consent Decree or the settlement it represents, nor shall any other document be used in construing the terms of this Consent Decree. Notwithstanding the foregoing, this Consent

Decree does not alter or otherwise affect the terms and provisions of either the CWQCD 2016 Consent Decree or the CO-US 2021 Consent Decree.

**XV. LODGING AND OPPORTUNITY FOR PUBLIC COMMENT**

24. This Consent Decree shall be lodged with the Court for a period of not less than thirty (30) Days for public notice and comment in accordance with 28 C.F.R. § 50.7. The Parties each reserve the right to withdraw or withhold consent if the comments regarding the Consent Decree disclose facts or other considerations indicating that the Consent Decree is inappropriate, improper, or inadequate.

25. If, for any reason, the Court should decline to approve this Consent Decree in the form presented, the Parties agree to reasonably cooperate with each other to make additional filings addressing the reasons the Court declined to approve the Consent Decree. If Court approval is not obtained, or if approval and entry is subsequently vacated on appeal of such approval and entry, either Party may unilaterally withdraw from the Consent Decree and the Consent Decree shall be null and void and the terms of the Consent Decree shall be inadmissible pursuant to Fed. R. Evidence 408 in any litigation between the Parties, and the State agrees to dismiss the Complaint without prejudice.

**XVI. SIGNATORIES/ SERVICE**

26. Each undersigned representative of the State and SGC certifies that he or she is authorized to enter into the terms and conditions of this Consent Decree and to execute and legally bind such Party to this document.

**XVII. FINAL JUDGMENT**

27. Upon entry of this Consent Decree by the Court, this Consent Decree will constitute the final judgment between and among the State and SGC with respect to the matters in this Consent Decree. The Court enters this judgment as a final judgment under Fed. R. Civ. P. 54 and Fed. R. Civ. P. 58.

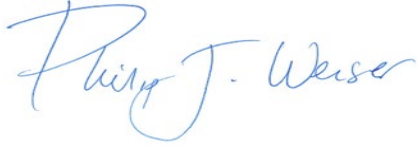
SO ORDERED THIS \_\_\_\_ DAY OF \_\_\_\_\_, 202\_.

\_\_\_\_\_  
United States District Judge

[SIGNATURE PAGES FOLLOW]



**FOR THE STATE OF COLORADO:**



Dated December 10, 2021

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PHILIP J. WEISER  
Colorado Attorney General  
Colorado Natural Resources Trustee



Dated December 10, 2021

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SHAUN MCGRATH  
Director of Environmental Programs,  
Colorado Department of Public Health and Environment  
For Jill Hunsaker Ryan, Executive Director,  
Colorado Department of Public Health and Environment  
Colorado Natural Resources Trustee



Dated December 10, 2021

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DAN GIBBS  
Executive Director, Colorado Department of Natural Resources  
Colorado Natural Resources Trustee

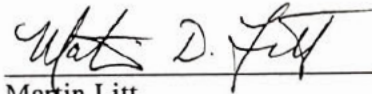
Approved as to form:

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/s/ Mary Emily Splitek  
MARY EMILY SPLITEK  
Assistant Attorney General  
Colorado Attorney General's Office

Dated December 10, 2021

**FOR SUNNYSIDE GOLD CORPORATION:**



Martin Litt  
President & General Counsel

Dated: 12-6-21

Approved as to form:



NEIL G. WESTESEN  
Crowley Fleck, PLLP  
Counsel for SGC

Dated: 12-6-2021

**UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF NEW MEXICO**

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IN RE: GOLD KING MINE RELEASE  
IN SAN JUAN COUNTY, COLORADO  
ON AUGUST 5, 2015

*This Document Relates to:*

*No. 16-cv-465-WJ/LF*

*No. 16-cv-931-WJ/LF*

*No. 18-cv-319-WJ*

*No. 18-cv-744-WJ*

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No. 1:18-md-02824-WJ

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**CONSENT DECREE**

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## **I. BACKGROUND**

A. The United States (as defined below) filed crossclaims (“USA MDL Crossclaims” as defined below) against the Sunnyside Gold Corporation (“SGC” as defined below) and the Kinross Gold Corporation (“KGC” as defined below) alleging claims under Sections 107(a) and 113(g)(2) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (“CERCLA”), 42 U.S.C. §§ 9607(a), and 9613(g)(2), and seeking reimbursement of, or contribution towards, response costs incurred or to be incurred for response actions taken or to be taken by the United States in connection with the release or threatened release of hazardous substances at the Bonita Peak Mining District Superfund Site located in San Juan County, Colorado (“Site” as defined below).

B. In accordance with section 121(f)(1)(F) of CERCLA, 42 U.S.C. § 9621(f)(1)(F), and section 300.520(a) of the National Contingency Plan, 40 C.F.R. Part 300.520(a), the United States notified the State of Colorado (“State” as defined below) on behalf of the United States Environmental Protection Agency (“EPA” as defined below) of negotiations with SGC and KGC as potentially responsible parties, and provided the State with an opportunity to participate in such negotiations and be a party to this Consent Decree.

C. The State submits to the jurisdiction of this Court solely for the purposes of this Consent Decree. By this Consent Decree, the State intends to resolve potential claims against SGC and KGC for reimbursement of response costs incurred or to be incurred for response actions taken or to be taken by the State in connection with the release or threatened release of hazardous substances at the Site, pursuant to Section 107(a) of CERCLA, 42 U.S.C. § 9607(a).

D. SGC and KGC (the “Settling Defendants” as defined below) do not admit any liability to the United States arising out of the transactions or occurrences alleged in the USA

MDL Crossclaims or to the State regarding potential claims stated in the preceding paragraph. Settling Federal Agencies (as defined below) do not admit any liability arising out of the transactions or occurrences alleged in any counterclaim or crossclaim asserted by Settling Defendants.

E. The EPA and SGC entered into an Administrative Settlement Agreement and Order on Consent for Remedial Investigation (“AOC” as defined below) filed May 11, 2017, with respect to the Mayflower Impoundments Area (as defined below), which is located within the Site.

F. On March 15, 2018, EPA issued a Unilateral Administrative Order for Remedial Investigation (“UAO” as defined below) to SGC with respect to Operable Unit 3 within the Site. On April 16, 2018, EPA issued a First Modification to the UAO. On June 7, 2019, EPA modified the Statement of Work, Work Plan, and Field Sampling Plan associated with the initial UAO. SGC ultimately declined to perform the work ordered in the modified UAO, advising EPA of its position in SGC’s Record of Position Memorandum (July 9, 2019).

G. On September 3, 2020, EPA issued an Administrative Order Directing Compliance with Request for Access (“AO” as defined below) to SGC with respect to EPA’s and the State’s access to the Mayflower Impoundments Area (as defined below).

H. On May 8, 1996, the District Court for the City and County of Denver, State of Colorado, approved and entered a Consent Decree between SGC and CWQCD (as defined below) in Sunnyside Gold Corporation v. Colorado Water Quality Control Division, Colorado Department of Public Health and the Environment, No. 94 CV 5459, (“CWQCD Consent Decree” as defined below), which resolved litigation related to the State’s Water Quality Control Act, C.R.S. § 25-8-101 *et seq.* Pursuant to the terms of the CWQCD Consent Decree, SGC



performed environmental reclamation actions on both SGC-owned and third-party property within the Site by July 3, 2003, the date the CWQCD filed its Notice of Termination of Court's Jurisdiction.

I. The United States, SGC, KGC, and Kinross Gold U.S.A., Inc. ("KGUSA" as defined below) are defendants in certain litigation that has been centralized through the multi-district litigation process in the United States District Court for the District of New Mexico ("MDL Litigation" as defined below). The United States, SGC, KGC, and KGUSA each deny that jurisdiction exists over them in the MDL Litigation. The United States has filed the USA MDL Crossclaims against SGC and KGC in the MDL Litigation, and SGC has filed counterclaims against the United States in the MDL Litigation ("SGC MDL Counterclaims" as defined below). The United States, SGC, KGC, and KGUSA have all denied liability in the MDL Litigation, including with respect to the USA MDL Crossclaims and SGC MDL Counterclaims. The form of this Consent Decree is unique to the specific circumstances involved, including the MDL Litigation, the USA MDL Crossclaims, the SGC MDL Counterclaims, and the CWQCD Consent Decree, and is not precedent for any other consent decree.

J. SGC intends to actively identify and work with third party prospective purchaser(s) to Transfer the SGC Property ("Transfer" and "SGC Property" as defined below). EPA and the State intend to support any Transfer by addressing a prospective purchaser's CERCLA liability concerns through the use of enforcement tools, as appropriate. EPA and the State are currently implementing response actions at the SGC Property. EPA and the State may perform additional response actions at the SGC Property in the future. SGC will not interfere with or impede EPA's or the State's performance of response actions at the Site, nor do the

Parties expect SGC to perform any response actions itself. KGC asserts that it does not have any property interest in the SGC Property or elsewhere in the Site.

K. The United States, the State, and Settling Defendants agree, and this Court by entering this Consent Decree finds, that this Consent Decree has been negotiated by the Parties in good faith, that settlement of this matter will avoid prolonged and complicated litigation between the Parties, and that this Consent Decree is fair, reasonable, and in the public interest.

**NOW, THEREFORE, it is hereby ORDERED, ADJUDGED and DECREED:**

## **II. JURISDICTION**

1. This Court has jurisdiction over the subject matter of this action pursuant to 28 U.S.C. §§ 1331, 1367, and 1345, and 42 U.S.C. §§ 9606, 9607, and 9613(b). Solely for the purposes of this Consent Decree, Settling Defendants waive all objections and defenses that any of them may have to subject matter or personal jurisdiction of this Court or to venue in this District. Settling Defendants will not challenge entry or the terms of this Consent Decree or this Court's jurisdiction to enter and enforce this Consent Decree.

## **III. PARTIES BOUND**

2. This Consent Decree is binding upon the United States and the State, and upon Settling Defendants and their respective successors and assigns. Except as provided in Paragraph 38, any change in ownership or corporate or other legal status, including, but not limited to, any Transfer of assets or real or personal property, will in no way alter the status or responsibilities of Settling Defendants under this Consent Decree.

## **IV. DEFINITIONS**

3. Unless otherwise expressly provided in this Consent Decree, terms used in this

Consent Decree that are defined in CERCLA or in regulations promulgated under CERCLA will have the meaning assigned to them in CERCLA or in such regulations. All other words will be assigned their normal meaning. Whenever terms listed below are used in this Consent Decree, the following definitions will apply:

“Affiliate” will mean any entity that, directly or indirectly through one or more intermediaries, controls, is controlled by, or is under common control with, the subject entity or entities;

“AO” will mean the Administrative Order Directing Compliance with Request for Access issued by EPA to SGC on September 3, 2020, including all appendices thereto;

“AOC” will mean the Administrative Settlement Agreement and Order on Consent for Remedial Investigation between the EPA and SGC, filed May 11, 2017, with respect to the Mayflower Impoundments Area, and all subsequent amendments or modifications thereto;

“BLM” will mean the U.S. Department of the Interior’s Bureau of Land Management and any successor departments, agencies, or instrumentalities;

“CERCLA” will mean the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. §§ 9601-9675;

“Consent Decree” will mean this Consent Decree;

“Continuation of Existing Migration” will mean, with respect to a Settling Defendant or a Settling Defendant Affiliate, the movement or release of contamination in connection with the Site that is not caused by the future actions of such Settling Defendant or a Settling Defendant Affiliate, and with respect to a Settling Federal Agency, the movement or release of contamination in connection with the Site that is not caused by the future actions of such Settling Federal Agency, and in each case occurring after Settling Defendants’ signature of the Consent

Decree;

“CWA” will mean the Federal Water Pollution Control Act, also known as the Clean Water Act, 33 U.S.C. §§ 1251-1387, as amended by the Oil Pollution Act of 1990;

“CWQCD” will mean the Water Quality Control Division of the Colorado Department of Public Health and the Environment;

“CWQCD Consent Decree” will mean the Consent Decree approved and entered on May 8, 1996, by the District Court for the City and County of Denver, State of Colorado between SGC and the CWQCD in Sunnyside Gold Corporation v. Colorado Water Quality Control Division, Colorado Department of Public Health and the Environment, No. 94 CV 5459, and its four amendments approved and entered April 14, 1997, January 4, 1999, October 13, 2000, and December 6, 2002, including all appendices thereto;

“Day” will mean a calendar day. In computing any period of time under this Consent Decree, where the last day would fall on a Saturday, Sunday, or federal or State holiday, the period will run until the close of business of the next working day;

“DOI” will mean the U.S. Department of the Interior and any successor departments, agencies, or instrumentalities;

“DOJ” will mean the U.S. Department of Justice and any successor departments, agencies, or instrumentalities;

“Echo Bay Exploration Inc.” will mean Echo Bay Exploration, Inc., a Delaware corporation and an Affiliate of SGC;

“Echo Bay Inc.” will mean Echo Bay Inc., a Delaware corporation and the direct corporate owner of SGC;

“Echo Bay Management Corporation” will mean Echo Bay Management Corporation, a

Delaware corporation and an Affiliate of SGC;

“Effective Date” will mean 60 Days from the date that this District Court enters the Consent Decree, unless an appeal of the entry of judgment is filed during the 60-day period; if an appeal is taken, the Effective Date will mean the date on which the District Court’s judgment is affirmed;

“EPA” will mean the U.S. Environmental Protection Agency and its successor departments, agencies, or instrumentalities;

“EPA Hazardous Substance Superfund” will mean the Hazardous Substance Superfund established by the Internal Revenue Code, 26 U.S.C. § 9507;

“Federal Natural Resource Trustees” will mean, among others, DOI and the U.S. Forest Service;

“Interest” will mean the London Interbank Offered Rate on the Effective Date plus 4%;

“KGC” will mean Kinross Gold Corporation, an Ontario, Canada corporation, including its capacity as the surviving entity from its 2006 amalgamation with Echo Bay Mines, Ltd.;

“KGUSA” will mean Kinross Gold U.S.A., Inc., a Nevada corporation;

“Mayflower Impoundments Area” will have the same meaning as the “Mayflower Tailings” as defined in the AOC;

“MDL Court” will mean the New Mexico federal district court presiding over the MDL Litigation;

“MDL Litigation” will mean the Multidistrict Litigation matters centralized in the District of New Mexico for pretrial proceedings, pursuant to the Transfer Order by the

United States Judicial Panel on Multidistrict Litigation, *In Re: Gold King Mine Release in San Juan County, Colorado, on August 5, 2015*, MDL No. 2824. MDL Litigation includes those matters with individual docket numbers 16-cv-465-WJ-LF; 16-cv-931-WJ-LF; 18-cv-319-WJ; 18-cv-744-WJ;

“National Contingency Plan” or “NCP” shall mean the National Oil and Hazardous Substances Pollution Contingency Plan promulgated pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, codified at 40 C.F.R. Part 300, and any amendments thereto.

“Paragraph” will mean a portion of this Consent Decree identified by an Arabic numeral or an upper or lower case letter;

“Parties” will mean the United States, the State, and the Settling Defendants;

“RCRA” will mean the Solid Waste Disposal Act, 42 U.S.C. §§ 6901-6992 (also known as the Resource Conservation and Recovery Act);

“Section” will mean a portion of this Consent Decree identified by a Roman numeral.

“Settling Defendants” will mean the Sunnyside Gold Corporation (“SGC”) and the Kinross Gold Corporation (“KGC”);

“Settling Defendants’ Related Parties” will mean: (i) Settling Defendants’ successors and assigns, and estates, but only to the extent that the liability of such person or entity is based on the liability of Settling Defendants; (ii) Settling Defendants’ former or current officers, directors and employees, but only to the extent that the liability of any such person is based on acts and/or omissions which occurred in the scope of the person’s employment or capacity as an officer, director, and employee; and (iii) the following Affiliates of Settling Defendants: Echo Bay Inc., KGUSA, White Pine Gold Corporation, Echo Bay Management Corporation, and Echo Bay Exploration Inc. and their successors and assigns but only to the extent the liability of these



entities, and their successors and assigns, relates to the Site or their capacity as an Affiliate of Settling Defendants;

“Settling Federal Agencies” will mean EPA, DOI, and the United States Department of Agriculture, on behalf of the United States Forest Service, and their successor departments, agencies, or instrumentalities;

“SGC” will mean Sunnyside Gold Corporation, a Delaware corporation;

“SGC MDL Counterclaims” will mean collectively any and all counterclaims, crossclaims, or other claims by SGC against the United States included in any pleading in the MDL Litigation including claims for Due Process violations, common law contribution, and those brought under CERCLA sections 107(a) for cost recovery, 113(g)(2) for future costs, 113(f)(3)(B) for contribution, and any claim under section 113(f)(1) for contribution;

“SGC Property” will mean real property currently owned by SGC within the Site, excluding the house and lot owned by SGC located at 1751 Mineral Street, Silverton, CO 81433;

“Site” will mean the Bonita Peak Mining District Superfund Site in San Juan County, Colorado, EPA Docket ID No. EPA-HQ-OLEM-2016-0152, as published in the Federal Register on September 9, 2016, 81 Fed. Reg. 62397. The definition for this Site will be construed to include all areas of the Site ever defined or described by EPA for purposes of or in relation to the National Priorities List, 40 C.F.R. Part 300, including any further expansion of such Site as may in the future be determined by EPA;

“Special Account” will mean the site-specific special account, within the EPA Hazardous Substance Superfund, established for the Site by EPA pursuant to Section 122(b)(3) of CERCLA, 42 U.S.C. § 9622(b)(3);

“State” will mean the State of Colorado and each of its departments, agencies, and

instrumentalities, including the CWQCD;

“State Natural Resource Trustees” will mean the Colorado Attorney General and the executive directors of Colorado’s Department of Public Health and the Environment and Department of Natural Resources;

“Transfer” will mean to sell, assign, convey, lease, mortgage, or grant a security interest in, or where used as a noun, a sale, assignment, conveyance, or other disposition of any interest by operation of law or otherwise. “Transferred,” “Transferring” and “Transferee” will have the corresponding meaning;

“UAO” will mean the Unilateral Administrative Order for Remedial Investigation issued by EPA to SGC on March 15, 2018, including all appendices thereto, with respect to Operable Unit 3 within the Site, as modified by its First Modification issued April 16, 2018, and the June 7, 2019 modifications of the Statement of Work, Work Plan, and Field Sampling Plan;

“United States” will mean the United States of America and each department, agency, and instrumentality of the United States, including EPA, DOI, BLM, USDA, and USFS;

“USA MDL Crossclaims” will mean collectively all crossclaims or other claims by the United States against SGC, KGC, or KGUSA included in any pleading in the MDL Litigation, including common law contribution and those claims brought under CERCLA sections 107(a) for cost recovery, 113(g)(2) for future costs, and any claim under section 113(f)(1) for contribution;

“USDA” will mean the United States Department of Agriculture, and its successor departments, agencies, or instrumentalities;

“USFS” will mean the USDA Forest Service and its successor departments, agencies, or instrumentalities; and

“White Pine Gold Corporation” will mean White Pine Gold Corporation, a Delaware corporation and an Affiliate of SGC.

## **V. STATEMENT OF PURPOSE**

4. By entering into this Consent Decree, the mutual objective of the Parties is for Settling Defendants and Settling Federal Agencies each to make a cash payment to resolve finally their alleged civil liability, and the liability of Settling Defendants’ Related Parties, with regard to the Site under CERCLA, CWA, and RCRA as provided in the Covenants by Plaintiffs in Section VIII, subject to the Reservations of Rights by United States and the State in Section X, and as provided in the Covenants by Settling Defendants in Section IX and the Effect of Settlement/Contribution Protection in Section XI.

## **VI. PAYMENTS**

5. Payments by Settling Defendants to the United States. Within 30 days after the Effective Date, SGC will make payment in the amount of \$40,950,000. If SGC does not make full payment within the time specified, KGC will make the full payment, including Interest pursuant to Paragraph 10, within five Days of such due date. Settling Defendants will make payment at <https://www.pay.gov> to the U.S. Department of Justice account, in accordance with instructions provided to Settling Defendants by the Financial Litigation Unit (“FLU”) of the U.S. Attorney's Office for the District of Colorado. The payment instructions provided by the FLU will include a Consolidated Debt Collection System (“CDCS”) number, which will be used to identify all payments required to be made in accordance with this Consent Decree. The FLU will provide the payment instructions to:

Name: Crowley Fleck PLLP c/o Brian Holland  
Address: 65 East Broadway Street, Suite 400, Butte MT 59701  
Phone: (406) 221-2428  
Email: [bholland@crowleyfleck.com](mailto:bholland@crowleyfleck.com)

Settling Defendants may change the individual to receive payment instructions on their behalf by providing written notice of such change to DOJ in accordance with Section XIV (Notices and Submissions).

6. Deposit of Payment. The total amount to be paid pursuant to Paragraph 5 will be deposited by EPA in the Special Account to be retained and used to conduct or finance response actions at or in connection with the Site, or to be transferred to appropriate federal accounts.

7. Notice of Payment. At the time of any payment required under Paragraph 5, Settling Defendants will send notice that payment has been made to DOJ, EPA, USDA, and DOI in accordance with Section XIV (Notices and Submissions). Such notice will reference the CDCS Number, Site ID Number A8M5, and DJ Number 90-11-3-1176.

8. Payment by Settling Defendants to the State. Within 30 days after the Effective Date, SGC will pay to the State \$4,050,000 either: by official bank check made payable to Colorado Department of Public Health and Environment and shall reference Bonita Peak Mining District – KGC / SGC; or by other means agreed to by the Settling Defendants and the State. If SGC does not make full payment within the time specified, KGC will make the full payment, including Interest pursuant to Paragraph 10, within five Days of such due date. If paying by bank check, Settling Defendants will send the bank check to:

Colorado Department of Public Health and Environment  
HMWMD, Attn: Jessica Hubbard, B2  
4300 Cherry Creek Drive South  
Denver, CO 80246-1530

9. Payments by Settling Federal Agencies.  
a. As soon as reasonably practicable after the Effective Date, the United States, on behalf of Settling Federal Agencies, will make payment in the amount of \$45,000,000

to appropriate federal accounts.

b. Interest. In the event that any payment required by Paragraph 9.a is not made within 120 days after the Effective Date, the United States, on behalf of Settling Federal Agencies, will pay Interest on the unpaid balance, with such Interest commencing on the 121st day after the Effective Date and accruing through the date of the payment.

c. The Parties to this Consent Decree recognize and acknowledge that the payment obligations of Settling Federal Agencies under this Consent Decree can only be paid from appropriated funds legally available for such purpose. Nothing in this Consent Decree will be interpreted or construed as a commitment or requirement that any Settling Federal Agency obligate or pay funds in contravention of the Anti-Deficiency Act, 31 U.S.C. § 1341, or any other applicable provision of law.

## **VII. FAILURE TO COMPLY WITH CONSENT DECREE**

10. Interest on Late Payments. If Settling Defendants fail to make any payment under Paragraphs 5 or 8 by the required due date, Interest will accrue on the unpaid amount starting from the Effective Date through the date of payment. Settling Defendants are jointly and severally liable for Interest due under any provision of this Consent Decree.

11. Stipulated Penalty.

a. If any amounts due to the United States under Paragraph 5 or due to the State under Paragraph 8 are not paid by the required date, Settling Defendants will be in violation of this Consent Decree and will pay, as a stipulated penalty, in addition to the Interest required by Paragraph 10 (Interest on Late Payments), \$1,000 per each Day that such payment is late. Settling Defendants are jointly and severally liable for any stipulated penalty due under any provision of this Consent Decree, except that SGC alone is liable for penalties under Paragraph

11.b.

b. If SGC does not comply with Paragraph 36 (Agreements Regarding Access and Non-Interference), SGC shall be in violation of this Consent Decree and shall pay to the United States, as a stipulated penalty, \$1,000 per violation per day of such noncompliance.

c. Stipulated penalties are due and payable within 30 Days after the date of the demand for payment of the penalties by the United States or the State. All payments to the United States under this Paragraph will be identified as “Stipulated Penalties” and will be made at <https://www.pay.gov> to the U.S. Department of Justice account, in accordance with instructions provided to Settling Defendants by the FLU of the U.S. Attorney’s Office for the District of Colorado, noting the DJ number 90-11-3-11676. All payments to the State under this Paragraph will be identified as “Stipulated Penalties” and will be made in accordance with payment instructions set forth in Paragraph 8 above.

d. At the time of payment, Settling Defendants will send notice that payment has been made to DOJ as provided in Paragraph 7 (Notice of Payment).

e. Penalties will accrue as provided in this Paragraph 11 regardless of whether the United States or the State has notified Settling Defendants of the violation or made a demand for payment, but penalties need only be paid upon demand. All penalties will begin to accrue on the Day after payment or performance is due and will continue to accrue through the date of payment or the final day of correction of the noncompliance or completion of the activity. Nothing in this Consent Decree will prevent the simultaneous accrual of separate penalties for separate violations of this Consent Decree.

12. If the United States or the State brings an action to enforce this Consent Decree and is the prevailing party, Settling Defendants will reimburse the United States or the State, as



applicable, for all costs of such action, including but not limited to costs of attorney time.

13. The obligations of Settling Defendants to pay amounts owed to the United States and the State under this Consent Decree are joint and several. In the event of the insolvency of any Settling Defendant or the failure by any Settling Defendant to make the payments required under this Consent Decree, the remaining Settling Defendants will be responsible for such payments. This Paragraph shall not apply to penalties under Paragraph 11.b.

14. Payments made under this Section will be in addition to any other remedies or sanctions available to the United States by virtue of Settling Defendants' failure to comply with the requirements of this Consent Decree.

15. Notwithstanding any other provision of this Section, the United States or the State may, in their unreviewable discretion, waive payment of any portion of the stipulated penalties that have accrued pursuant to this Consent Decree. Payment of stipulated penalties will not excuse Settling Defendants from payment as required by Paragraph 5 (Payments by Settling Defendants to the United States) or Paragraph 8 (Payments by Settling Defendants to the State) or from performance of any other requirements of this Consent Decree.

#### **VIII. COVENANTS BY PLAINTIFFS**

16. Covenants for Settling Defendants by United States. Except as specifically provided in Paragraph 27 (General Reservations of the United States' and the State's Rights), the United States covenants: (a) not to sue or to take administrative action against Settling Defendants pursuant to Sections 106, 107(a), and 113 of CERCLA, 42 U.S.C. §§ 9606, 9607(a), and 9613, with regard to the Site; (b) not to sue or to take administrative action against Settling Defendants pursuant to Section 3008 and 7003 of RCRA, 42 U.S.C. §§ 6928 and 6973, in connection with the Site; (c) not to sue or to take administrative action against SGC relative to

the AO, AOC, or UAO and to terminate the AO, AOC, and UAO and release SGC from all liabilities with respect thereto; and (d) not to sue or to take administrative action against Settling Defendants pursuant to Section 309 and 311 of the CWA, 33 U.S.C. §§ 1319 and 1321, in connection with the Site.

17. The United States further covenants to: (a) make the necessary stipulated dismissal filing in the MDL Litigation within 40 Days of the Effective Date, conditioned upon the satisfactory performance by Settling Defendants of their obligations to make payments pursuant to Paragraph 5 (Payments by Settling Defendants to the United States) and Paragraph 8 (Payments by Settling Defendants to the State) under this Consent Decree; (b) request the MDL Court issue an order dismissing with prejudice the USA MDL Crossclaims; provided, however, that if the MDL Court does not issue such order of dismissal, then the United States covenants to consult with counsel for SGC and KGC for purposes of determining how to effectuate dismissal of the USA MDL Crossclaims, and until such dismissal not to take any action in furtherance of the USA MDL Crossclaims; and (c) forego future discovery regarding the USA MDL Crossclaims in the MDL Litigation.

18. Covenants for Settling Defendants by the State. Except as specifically provided in Paragraph 27 (General Reservations of the United States' and the State's Rights), the State covenants: (a) not to sue or to take administrative action against Settling Defendants pursuant to Sections 107(a) of CERCLA, 42 U.S.C. § 9607(a), or Title 25, Article 16, Part 1 of the Colorado Revised Statutes, with regard to the Site; (b) not to sue or to take administrative action against Settling Defendants pursuant to Title 25, Article 15, Part 3 of the Colorado Revised Statutes or Title 30, Article 20, Part 1 of the Colorado Revised Statutes, in connection with the Site; and (c) not to sue or to take administrative action against Settling Defendants pursuant to Section 309 of

the CWA, 33 U.S.C. § 1319, or Title 25, Article 8, Part 6 of the Colorado Revised Statutes, or the CWQCD Consent Decree, in connection with the Site.

19. All covenants in Paragraphs 16, 17, and 18 will take effect upon the Effective Date. All covenants in Paragraphs 16, 17, and 18 are conditioned upon the satisfactory performance by Settling Defendants of their obligations to make payments pursuant to Paragraph 5 (Payments by Settling Defendants to the United States) or Paragraph 8 (Payments by Settling Defendants to the State) under this Consent Decree. Except as provided in this Paragraph 19, all of the foregoing covenants extend only to Settling Defendants and do not extend to any other person. The covenants not to sue in Paragraphs 16 and 18 (and the reservations thereto), however, will also apply to Settling Defendants' Related Parties provided however, that, subject to Paragraph 32, should any of Settling Defendants' Related Parties assert claim(s) against the United States for any "matters addressed" under this Consent Decree, the covenants in Paragraphs 16 and 18 will, as to that party, be null and void.

20. Covenants for DOI, EPA, and USDA. Except as specifically provided in Section X (Reservation of Rights by Parties), EPA, DOI, and USDA covenant not to take administrative action against another Settling Federal Agency, pursuant to Sections 106 and 107(a) of CERCLA, 42 U.S.C. §§ 9606 and 9607(a), with regard to the Site. The State covenants not to sue or take administrative action against Settling Federal Agencies, pursuant to Section 107(a) of CERCLA, 42 U.S.C. § 9607(a), and Title 25, Article 16, Part 1 of the Colorado Revised Statutes, with regard to the Site. These covenants will take effect upon the Effective Date. These covenants are conditioned upon the satisfactory performance by Settling Federal Agencies of their obligations under this Consent Decree. These covenants extend only to Settling Federal Agencies and do not extend to any other person.

**IX. COVENANTS AND WAIVERS BY SETTLING DEFENDANTS AND SETTLING FEDERAL AGENCIES**

21. Covenants by Settling Defendants. Except as specifically provided in Paragraph 29 (General Reservations of Settling Defendants' Rights) and Paragraph 30, Settling Defendants covenant not to sue and agree not to assert any claims or causes of action against the United States or the State, or their contractors or employees, in connection with the Site and this Consent Decree, including but not limited to:

- a. any direct or indirect claim for reimbursement from the EPA Hazardous Substance Superfund based on Sections 106(b)(2), 107, 111, 112, or 113 of CERCLA, 42 U.S.C. §§ 9606(b)(2), 9607, 9611, 9612, or 9613, or any other provision of law;
- b. any claim arising out of response actions at or in connection with the Site, including any claim under the United States Constitution, the Colorado Constitution, the Tucker Act, 28 U.S.C. § 1491, the Equal Access to Justice Act, 28 U.S.C. § 2412, or at common law; or
- c. any claim pursuant to Sections 107 or 113 of CERCLA, 42 U.S.C. §§ 9607 or 9613, Section 7002(a) of RCRA, 42 U.S.C. § 6972(a), under Section 311, 504 and 505 of the CWA, 33 U.S.C. §§ 1321, 1364 and 1365, or state law relating to the Site.

22. SGC also covenants to: (a) make the necessary stipulated dismissal filing in the MDL Litigation within 40 Days of the Effective Date; (b) request the MDL Court issue an order dismissing with prejudice the SGC MDL Counterclaims; provided, however, that if the MDL Court does not issue such order of dismissal, then SGC covenants to consult with counsel for United States for purposes of determining how to effectuate dismissal of the SGC MDL Counterclaims, and until such dismissal not to take any action in furtherance of the SGC MDL Counterclaims; and (c) forego future discovery regarding the SGC MDL Counterclaims in the MDL Litigation.

23. Covenant by Settling Federal Agencies. Settling Federal Agencies agree not to assert any direct or indirect claim for reimbursement from the EPA Hazardous Substance Superfund through CERCLA §§ 106(b)(2), 107, 111, 112, 113 or any other provision of law with respect to the Site and this Consent Decree. This covenant does not preclude demand for reimbursement from the Superfund of costs incurred by a Settling Federal Agency in the performance of its duties (other than pursuant to this Consent Decree) as lead or support agency under National Contingency Plan.

24. Except as provided in Paragraph 26 (Waiver of Claims by Settling Defendants) and Paragraph 35 (res judicata and other defenses), the covenants in this Section shall not apply in the event the United States or the State bring a cause of action or issue an order pursuant to any of the reservations in Section X (Reservations of Rights by Parties), other than in Paragraph 27.a (liability for failure to meet a requirement of the Consent Decree) or 27.b (criminal liability), but only to the extent that Settling Defendants' claims arise from the same response action or response costs that the United States or the State is seeking pursuant to the applicable reservation.

25. Nothing in this Consent Decree will be deemed to constitute approval or preauthorization of a claim within the meaning of Section 111 of CERCLA, 42 U.S.C. § 9611, or 40 C.F.R. § 300.700(d).

26. Waiver of Claims by Settling Defendants. Settling Defendants agree not to assert any claims and to waive all claims or causes of action (including but not limited to claims or causes of action under Sections 107(a) and 113 of CERCLA) that they may have for response costs relating to the Site against each other or any other person who is a potentially responsible party under CERCLA at the Site. This waiver shall not apply with respect to any defense, claim,

or cause of action that a Settling Defendant may have against any person if such person asserts a claim or cause of action relating to the Site against such Settling Defendant. This waiver also shall not apply to any defense, claim, or cause of action that a Settling Defendant may have against any person other than the United States, if any such person was a party to a contract with SGC or an Affiliate of SGC and refuses or fails upon request of SGC to agree that such person will not assert a claim or cause of action relating to the Site against SGC or any Affiliate of SGC, or such person asserts such a claim or cause of action against SGC or any Affiliate of SGC.

## **X. RESERVATIONS OF RIGHTS BY PARTIES**

27. General Reservations of the United States' and the State's Rights. The United States and the State reserve, and this Consent Decree is without prejudice to, all rights against Settling Defendants and Settling Defendants' Related Parties, and EPA, the Federal Natural Resource Trustees, and the State Natural Resource Trustees reserve, and this Consent Decree is without prejudice to, all rights against Settling Federal Agencies, with respect to all matters not expressly included within Paragraphs 16 (Covenants for Settling Defendants by United States) , 18 (Covenants for Settling Defendants by the State), and 20 (Covenants for DOI, EPA, and USDA). Notwithstanding any other provision of this Consent Decree, the United States and the State reserve, and this Consent Decree is without prejudice to, all rights against Settling Defendants and Settling Defendants' Related Parties, and EPA, the Federal Natural Resource Trustees, and the State Natural Resource Trustees reserve, and this Consent Decree is without prejudice to, all rights against Settling Federal Agencies with respect to:

- a. liability for failure of Settling Defendants or Settling Federal Agencies to meet a requirement of this Consent Decree;
- b. criminal liability;



- c. liability for damages for injury to, destruction of, or loss of natural resources, and for the costs of any natural resource damage assessments;
- d. liability based on the ownership or operation of the Site by Settling Defendants or Settling Federal Agencies when such ownership or operation commences after signature of this Consent Decree by Settling Defendants or Settling Federal Agencies. The Continuation of Existing Migration would not result in liability;
- e. liability based on Settling Defendants' or Settling Federal Agencies' transportation, treatment, storage, or disposal, or arrangement for transportation, treatment, storage, or disposal of a hazardous substance or a solid waste at or in connection with the Site, commencing after signature of this Consent Decree by Settling Defendants. The Continuation of Existing Migration would not result in liability; and
- f. liability arising from the past, present, or future disposal, release or threat of release of a hazardous substance, pollutant, or contaminant not associated with the Site.

28. Notwithstanding any other provision of this Consent Decree, the United States specifically reserves the ability and right to assert defenses in the MDL Litigation.

29. General Reservations of Settling Defendants' Rights. The Settling Defendants reserve, and this Consent Decree is without prejudice to, all rights against the United States and the State with respect to all matters not expressly included within Paragraphs 21 and 22 (Covenants by Settling Defendants). Notwithstanding any other provision of this Consent Decree, the Settling Defendants reserve, and this Consent Decree is without prejudice to, all rights against the United States and the State with respect to liability for failure of the United States or the State to meet a requirement of this Consent Decree.

30. Notwithstanding any other provision of this Consent Decree, the Settling

Defendants specifically reserve the ability and right to assert defenses in the MDL Litigation.

## **XI. EFFECT OF SETTLEMENT/CONTRIBUTION PROTECTION**

31. Except as provided in Paragraph 26 (Waiver of Claims by Settling Defendants), and Paragraphs 16, 18, 19, and 32 as applicable to Settling Defendants' Related Parties, nothing in this Consent Decree will be construed to create any rights in, or grant any cause of action to, any person or entity not a Party to this Consent Decree. Except as provided in Section IX (Covenants and Waivers by Settling Defendants and Settling Federal Agencies), each of the Parties expressly reserves any and all rights (including, but not limited to, pursuant to Section 113 of CERCLA, 42 U.S.C. § 9613), defenses, claims, demands, and causes of action that it may have with respect to any matter, transaction, or occurrence relating in any way to the Site against any person not a Party. Nothing in this Consent Decree diminishes the right of the United States and the State, pursuant to Section 113(f)(2) and (3) of CERCLA, 42 U.S.C. § 9613(f)(2)-(3), to pursue any such persons to obtain additional response costs or response action and to enter into settlements that give rise to contribution protection pursuant to Section 113(f)(2).

32. The Parties agree, and by entering this Consent Decree this Court finds, that this Consent Decree constitutes a judicially-approved settlement pursuant to which each Settling Defendant, Settling Defendants' Related Party, and each Settling Federal Agency, as of the Effective Date, resolved liability to the United States within the meaning of Section 113(f)(2) of CERCLA, 42 U.S.C. § 9613(f)(2), and is entitled, as of the Effective Date, to protection from contribution actions or claims as provided by Section 113(f)(2) of CERCLA, or as may be otherwise provided by law, for the "matters addressed" in this Consent Decree. The "matters addressed" in this Consent Decree as to all Parties and Settling Defendants' Related Parties include all response actions taken or to be taken and all response costs incurred or to be incurred,

at or in connection with the Site, by the United States, the State or any other person, provided, however, that if the United States or the State exercises rights under the reservations in Section X (Reservations of Rights by Parties), other than in Paragraph 27.a (liability for failure to meet a requirement of the Consent Decree) or 27.b (criminal liability), the “matters addressed” in this Consent Decree will no longer include those response costs or response actions that are within the scope of the exercised reservation. The contribution protection set forth in this Paragraph is intended to provide the broadest protection afforded by CERCLA or state law for “matters addressed” in this Consent Decree.

33. The Parties further agree, and by entering this Consent Decree this Court finds, that this action is a civil action within the meaning of Section 113(f)(1) of CERCLA, 42 U.S.C. § 9613(f)(1), and that this Consent Decree constitutes a judicially-approved settlement pursuant to which each Settling Defendant, each Settling Defendants’ Related Party, and each Settling Federal Agency has, as of the Effective Date, resolved liability to the United States within the meaning of Section 113(f)(3)(B) of CERCLA, 42 U.S.C. § 9613(f)(3)(B).

34. Each Settling Defendant will, with respect to any suit or claim brought by it for matters related to this Consent Decree, notify EPA, DOJ, DOI, USDA, and the State in writing no later than 60 Days prior to the initiation of such suit or claim. This 60-Day notice will not apply to any suit or claim concerning third party contractual indemnification matters, unless otherwise provided by law. Each Settling Defendant also will, with respect to any suit or claim brought against it for matters related to this Consent Decree, notify EPA, DOJ, DOI, USDA, and the State in writing within 10 Days after service of the complaint or claim upon it. In addition, the Settling Defendant will notify EPA, DOJ, DOI, USDA, and the State within 10 Days after service or receipt of any Motion for Summary Judgment, and within 10 Days after receipt of any

order from a court setting a case for trial, for matters related to this Consent Decree.

35. In any subsequent administrative or judicial proceeding initiated by the United States or the State for injunctive relief, recovery of response costs, or other relief relating to the Site, Settling Defendants, Settling Defendants' Related Parties, and, with respect to a State action, Settling Federal Agencies will not assert, and may not maintain, any defense or claim based upon the principles of waiver, res judicata, collateral estoppel, issue preclusion, claim-splitting, or other defenses based upon any contention that the claims raised by the United States or the State in the subsequent proceeding were or should have been brought in the instant case; provided, however, that nothing in this Paragraph 35 affects (a) the enforceability of the covenants by the United States set forth in Section VIII (Covenants by Plaintiffs) or (b) the Settling Defendants' reserved rights set forth in Paragraph 29 (General Reservation of Settling Defendants' Rights) and Paragraph 30.

## **XII. PROPERTY PROVISIONS**

36. Agreements Regarding Access and Non-Interference. Until a Transfer of SGC Property (whether a Transfer of all SGC Property or less than all), SGC will, with respect to SGC Property not yet Transferred:

a. Provide the United States, the State, potentially responsible parties who have entered or may enter into an agreement with the United States for performance of response actions at the Site (hereinafter "Performing Parties"), and their representatives, contractors, and subcontractors with access at all reasonable times to SGC Property to conduct any activity relating to response actions at the Site including the following activities:

1. Verifying any data or information submitted to the United States;
2. Conducting field inspections and investigations regarding

contamination at or near the Site;

3. Sampling and monitoring water, soil, and mine waste material from waste rock dumps, tailings impoundments, and mine workings or other areas as necessary to evaluate releases of hazardous substances, and as needed to design, construct, operate, and maintain an on-site waste repository and ancillary features, including, but not limited to, access roads;
  4. Assessing the need for, planning, implementing, or monitoring response actions (which includes implementing the Interim Record of Decision including construction, operation, and maintenance of an on-site mine waste repository and necessary access roads, and transportation of mine waste to the repository);
  5. Conducting actions related to the investigation of surface or subsurface contamination;
  6. Assessing SGC's and any Performing Party's compliance with the Consent Decree;
  7. Determining whether the SGC Property is being used in a manner that is prohibited or restricted, or that may need to be prohibited or restricted, under the Consent Decree; and
  8. Implementing, monitoring, maintaining, reporting on, and enforcing any institutional controls or any land, water, or other resource use restrictions regarding the SGC Property.
- b. SGC will refrain from using the SGC Property in any manner that EPA,

DOI, USDA, or the State determines, after notice to SGC, will (i) pose an unacceptable risk to human health or to the environment due to exposure to hazardous substances or (ii) interfere with or adversely affect the implementation, integrity, or protectiveness of response actions at the Site.

c. Upon the Effective Date, this Consent Decree will supersede the AO.

37. Institutional Controls. If EPA determines in a decision document prepared in accordance with the NCP that institutional controls in the form of state or local laws, regulations, ordinances, zoning restrictions, or other governmental controls or notices are needed regarding the SGC Property, SGC will cooperate with EPA's efforts to secure and ensure compliance with such institutional controls, provided that such duty to cooperate shall consist of commercially reasonable efforts.

38. Notice to Successors-in-Title.

a. SGC will, within 15 days after the Effective Date, submit for EPA approval a notice to be filed regarding the SGC Property in the appropriate land records. The notice must:

- i. include a proper legal description of the SGC Property; and
- ii. provide notice to all successors-in-title that the SGC Property is part of, or related to, the Site.

b. SGC will record the notice within 10 days after EPA's approval of the notice and submit to EPA, within 10 days thereafter, a certified copy of the recorded notice.

c. SGC will, prior to entering into a contract to Transfer SGC Property, or 40 days prior to Transferring SGC Property, whichever is earlier, notify EPA and the State of the name and address of the proposed Transferee.



d. In the event of any Transfer of SGC Property, SGC shall, with respect to the SGC Property being Transferred, require the Transferee to agree to comply with, and be bound by, the provisions of Section XII applicable to SGC and the penalty provisions in Paragraph 11.b. Upon completion of such Transfer, SGC shall be relieved of all its obligations under Section XII and Paragraph 11.b with respect to such Transferred SGC Property. SGC will continue to comply with its obligations under Section XII with respect to any SGC Property not Transferred.

39. Notwithstanding any provision of this Consent Decree, the United States and the State retain all of their access authorities and rights, as well as all of their rights to require institutional controls, including enforcement authorities related thereto, under CERCLA, RCRA, and any other applicable statute or regulations.

40. SGC Property Necessary For Response Actions. If EPA determines in a decision document prepared in accordance with the NCP that title to SGC Property is needed to conduct a remedial action at the Site, EPA will make a request, and SGC will convey by quit claim deed title, without warranty and at no cost to the United States such SGC Property as requested by the United States to such person or entity the United States designates. All closing and recording costs associated with such conveyance will be the responsibility of the United States. SGC agrees to cooperate with the United States in clearing impediments to clean title, if any, provided that such duty to cooperate shall consist of commercially reasonable efforts.

41. Possible Transfer of SGC Property. SGC seeks to Transfer the SGC Property (along with Property Provision obligations under this Section) to a third party Transferee. In the event SGC finds a prospective Transferee, the United States and the State will use federal and state enforcement tools, as and if appropriate, that may be available to assist in the Transfer by

SGC of such SGC Property.

### **XIII. RETENTION OF RECORDS**

42. Until 10 years after the Effective Date, each Settling Defendant will preserve and retain all non-identical copies of records, reports, documents, and other information (including records, reports, documents, and other information in electronic form) (hereinafter referred to as "Records") now in its possession or control or that come into its possession or control, that relate in any manner to its alleged liability under CERCLA with respect to the Site, as well as all Records that relate to the liability of any other person under CERCLA with respect to the Site. Each of the above record retention requirements will apply regardless of any corporate retention policy to the contrary. The requirements of this Paragraph 42 will not prevent any Settling Defendant from dissolving.

43. At the conclusion of the record retention period, or at such time as a Settling Defendant may choose to dissolve, Settling Defendants will notify EPA, DOJ, DOI, USDA, and the State at least 90 Days prior to the destruction of any such Records, and, upon request by EPA, DOJ, DOI, USDA or the State, and except as provided in Paragraph 44 (Privileged and Protected Claims), Settling Defendants will deliver any such Records to EPA, DOI, USDA, or the State.

44. Privileged and Protected Claims.

a. Settling Defendants may assert that all or part of a Record is privileged or protected as provided under federal law, provided they comply with Paragraph 44.b, and except as provided in Paragraph 44.c;

b. If Settling Defendants assert a claim of privilege or protection, they will provide the United States or the State with the following information regarding such Record: its title; its date; the author; the addressee or recipient; a description of the Record's contents; and

the privilege or protection asserted. If a claim of privilege or protection applies only to a portion of a Record, Settling Defendants will provide the Record to the United States or the State in redacted form to mask the privileged or protected information only. Settling Defendants will retain all Records that they claim to be privileged or protected until the United States or the State has had a reasonable opportunity to dispute the privilege or protection claim and any such dispute has been resolved in the Settling Defendants' favor; and

c. Settling Defendants may make no claim of privilege or protection regarding:

1. any data regarding the Site, including but not limited to, all sampling, analytical, monitoring, hydrogeologic, scientific, chemical, radiological, or engineering data, or the portion of any other Record that evidences conditions at or around the Site; or
2. the portion of any Record that Settling Defendants are required to create or generate pursuant to this Consent Decree.

45. Business Confidential Claims. Settling Defendants may assert that all or part of a Record submitted to the United States or the State under this Section XIII (Retention of Records) is business confidential to the extent permitted by and in accordance with Section 104(e)(7) of CERCLA, 42 U.S.C. § 9604(e)(7), and 40 C.F.R. 2.203(b). Settling Defendants will segregate and clearly identify all Records or parts thereof submitted under this Consent Decree for which Settling Defendants assert a business confidentiality claim. Records that Settling Defendants claim to be confidential business information will be accorded the protection specified in 40 C.F.R. Part 2, Subpart B. If no claim of confidentiality accompanies Records when they are submitted to EPA and the State, or if EPA has notified Settling Defendants that the Records are

not confidential under the standards of Section 104(e)(7) of CERCLA or 40 C.F.R. Part 2 Subpart B, the public may be given access to such Records without further notice to Settling Defendants.

46. Each Settling Defendant certifies individually that, to the best of its knowledge and belief, after thorough inquiry, it has not altered, mutilated, discarded, destroyed or otherwise disposed of any Records (other than identical copies) relating to its potential liability regarding the Site since notification of potential liability by the United States and that it has fully complied with any and all EPA, DOI, or USDA requests for information regarding the Site pursuant to Sections 104(e) and 122(e)(3)(B) of CERCLA, 42 U.S.C. §§ 9604(e) and 9622(e)(3)(B), Section 3007 of RCRA, 42 U.S.C. § 6927.

47. Notwithstanding any provision of this Consent Decree, the United States and the State retain all of their information gathering and inspection authorities and rights, including enforcement actions related thereto, under CERCLA, RCRA, and any other applicable statutes or regulations; provided, however, that nothing in this Paragraph 47 affects (a) the enforceability of the covenants by the United States and the State set forth in Paragraphs 16 (Covenants for Settling Defendants by United States) and 18 (Covenants for Settling Defendants by the State), (b) the Settling Defendants reserved rights set forth in Paragraph 29 (General Reservations of Settling Defendants' Rights) and Paragraph 30, or (c) the provisions in Section XII (Property Provisions).

#### **XIV. NOTICES AND SUBMISSIONS**

48. Whenever, under the terms of this Consent Decree, notice is required to be given or a document is required to be sent by one Party to another, it will be directed to the individuals at the addresses specified below, unless those individuals or their successors give notice of a change to the other Parties in writing. Except as otherwise provided, notice to a Party by email

(if that option is provided below) or by regular mail in accordance with this Section satisfies any notice requirement of the Consent Decree regarding such Party.

**As to DOJ by email:** eescdcopy.enrd@usdoj.gov  
Re: DJ# 90-11-3-11676

**As to DOJ by mail:** EES Case Management Unit  
U.S. Department of Justice  
Environment and Natural Resources Division  
P.O. 7611  
Washington, D.C. 20044-7611  
Re: DJ # 90-11-3-11676

**and:** Chief  
U.S. Department of Justice  
Environment and Natural Resources Division  
Environmental Defense Section  
P.O. 7611  
Washington, D.C. 20044-7611  
Re: DJ # 90-11-3-11676

**As to EPA:** William Lindsey  
Senior Assistant Regional Counsel  
CERCLA Enforcement Section  
Office of Regional Counsel (8ORC-C)  
USA EPA Region 8  
1595 Wynkoop Street  
Denver, Colorado 80202-1129  
Lindsey.William@epa.gov

Douglas Naftz  
Senior Assistant Regional Counsel  
CERCLA Enforcement Section  
Office of Regional Counsel (8ORC-C)  
U.S. EPA Region 8  
1595 Wynkoop Street  
Denver, CO 80202-1129  
Naftz.Douglas@epa.gov

**As to USDA:** Kirk Minckler  
Office of the General Counsel  
U.S. Department of Agriculture  
1617 Cole Boulevard, Suite 385E  
Lakewood, CO 80401-3305  
kirk.minckler@usda.gov

**As to DOI:** Nathalie Doherty  
Attorney-Advisor  
U.S. Department of the Interior  
Office of the Solicitor  
601 SW 2nd Avenue, Suite 1950  
Portland, OR 97204  
Nathalie.Doherty@sol.doi.gov

**As to the State:** Jason King  
Senior Assistant Attorney General  
Colorado Department of Law  
1300 Broadway, 7<sup>th</sup> Floor  
Denver, CO 80203  
Jason.King@coag.gov

**As to Sunnyside Gold Corporation:** Christopher C. Stoneback  
Crowley Fleck PLLP  
490 North 31st Street, Suite 500  
Billings MT, 59101-1288  
cstoneback@crowleyfleck.com

**As to Kinross Gold Corporation:** Craig Galli  
Holland & Hart LLP  
222 S. Main Street, Suite 2200  
Salt Lake City, UT 84101  
cgalli@hollandhart.com

*with a copy to:*

General Counsel  
Kinross Gold Corporation  
25 York St., 17th Floor  
Toronto, Ontario M5J 2V5  
Canada

## **XV. RETENTION OF JURISDICTION**

49. This Court will retain jurisdiction over this matter for the purpose of interpreting and enforcing the terms of this Consent Decree.



## **XVI. INTEGRATION**

50. This Consent Decree constitutes the final, complete and exclusive agreement and understanding among the Parties with respect to the settlement embodied in this Consent Decree. The Parties acknowledge that there are no representations, agreements, or understandings relating to the settlement other than those expressly contained in this Consent Decree.

## **XVII. LODGING AND OPPORTUNITY FOR PUBLIC COMMENT**

51. This Consent Decree will be lodged with the Court for a period of at least 30 Days for public notice and comment. The United States and the State reserve the right to withdraw or withhold their consent if the comments regarding the Consent Decree disclose facts or considerations that indicate that this Consent Decree is inappropriate, improper, or inadequate. Settling Defendants consent to the entry of this Consent Decree without further notice.

52. If for any reason this Court should decline to approve this Consent Decree in the form presented, this Consent Decree is voidable at the sole discretion of any Party and the terms of the Consent Decree may not be used as evidence in any litigation between the Parties.

## **XVIII. SIGNATORIES/SERVICE**

53. Each undersigned representative of a Settling Defendant and the Assistant Attorney General, U.S. Department of Justice, Environment and Natural Resources Division, or his designee and the Assistant Attorney General, Colorado Department of Law, Natural Resources and Environment Section certifies that he or she is authorized to enter into the terms and conditions of this Consent Decree and to execute and bind legally such Party to this document.


54. Each Settling Defendant agrees not to oppose entry of this Consent Decree by this Court or to challenge any provision of this Consent Decree, unless the United States or the State

has notified Settling Defendants in writing that it no longer supports entry of the Consent Decree.

55. Each Settling Defendant will identify, on the attached signature pages, the name and address of an agent who is authorized to accept service of process by mail on behalf of that Party with respect to all matters arising under or relating to this Consent Decree. Settling Defendants hereby agree to accept service in that manner and to waive the formal service requirements set forth in Rule 4 of the Federal Rules of Civil Procedure and any applicable local rules of this Court, including but not limited to, service of a summons.

#### **XIX. FINAL JUDGMENT**

56. Upon entry of this Consent Decree by the Court, this Consent Decree will constitute the final judgment between and among the United States, the State, and the Settling Defendants. The Court enters this judgment as a final judgment under Fed. R. Civ. P. 54 and 58. SO ORDERED THIS 28th DAY OF April, 2022.

  
\_\_\_\_\_  
**WILLIAM P. JOHNSON**  
**CHIEF UNITED STATES DISTRICT JUDGE**

THE UNDERSIGNED PARTY enters into this Consent Decree in the matter of In re: Gold King Mine Release in San Juan County, Colorado on August 5, 2015, No. 1:18-md-02824-WJ, relating to the Bonita Peak Mining District Site.

FOR THE UNITED STATES OF AMERICA:

TODD KIM  
Assistant Attorney General  
Environment and Natural Resources Division  
U.S. Department of Justice

Dated: \_\_\_\_\_

NICHOLAS  
MORALES

 Digitally signed by NICHOLAS  
MORALES  
Date: 2022.01.20 14:55:35 -05'00'

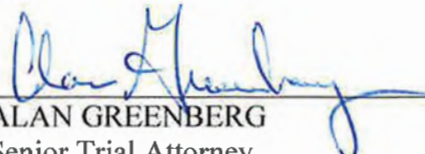
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NICHOLAS MORALES  
Trial Attorney  
RUBEN GOMEZ  
Senior Attorney  
KATHERINE MATTHEWS  
Senior Counsel  
Environment and Natural Resources Division  
Environmental Enforcement Section  
United States Department of Justice  
P.O. Box 7611  
Washington, D.C. 20044-7611  
Phone: (202) 616-8860 (Morales)  
Phone: (202) 514-4797 (Gomez)  
E-mail: nicholas.morales@usdoj.gov  
E-mail: ruben.gomez@usdoj.gov

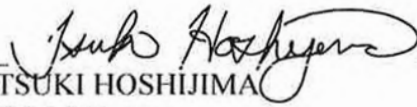
THE UNDERSIGNED PARTY enters into this Consent Decree in the matter of In re: Gold King Mine Release in San Juan County, Colorado on August 5, 2015, No. 1:18-md-02824-WJ, relating to the Bonita Peak Mining District Site.

FOR THE UNITED STATES OF AMERICA:

Dated: Jan. 19, 2022

  
ALAN GREENBERG  
Senior Trial Attorney  
U.S. Department of Justice  
Environment and Natural Resources Division  
Environmental Defense Section  
999 18th Street, Suite 370  
Denver, CO 80202  
alan.greenberg@usdoj.gov  
(303) 844-1366

Dated: January 19, 2022

  
TSUKI HOSHIJIMA  
Trial Attorney  
U.S. Department of Justice  
Environment and Natural Resources Division  
Environmental Defense Section  
P.O. Box 7611  
Washington, D.C. 20004-7611  
(202) 514-3468  
tsuki.hoshijima@usdoj.gov

THE UNDERSIGNED PARTY enters into this Consent Decree in the matter of In re: Gold King Mine Release in San Juan County, Colorado on August 5, 2015, No. 1:18-md-02824-WJ, relating to the Bonita Peak Mining District Site.

FOR THE U.S. ENVIRONMENTAL PROTECTION AGENCY:

Dated: \_\_\_\_\_

KENNETH  
SCHEFSKI

Digitally signed by KENNETH  
SCHEFSKI  
Date: 2021.12.08 09:16:59 -07'00'

---

KENNETH C. SCHEFSKI  
Regional Counsel  
U.S. Environmental Protection Agency  
Region 8  
1595 Wynkoop St.  
Denver, CO 80202

THE UNDERSIGNED PARTY enters into this Consent Decree in the matter of In re: Gold King Mine Release in San Juan County, Colorado on August 5, 2015, No. 1:18-md-02824-WJ, relating to the Bonita Peak Mining District Site.

FOR THE U.S. ENVIRONMENTAL PROTECTION AGENCY:

Dated: \_\_\_\_\_

LAWRENCE  
STARFIELD

Digitally signed by LAWRENCE  
STARFIELD  
Date: 2021.12.08 14:47:20  
-05'00'

---

LAWRENCE E. STARFIELD  
Acting Assistant Administrator  
Office of Enforcement and Compliance Assurance  
U.S. Environmental Protection Agency  
1200 Pennsylvania Ave. NW  
Washington, DC 20460



THE UNDERSIGNED PARTY enters into this Consent Decree in the matter of In re: Gold King Mine Release in San Juan County, Colorado on August 5, 2015, No. 1:18-md-02824-WJ, relating to the Bonita Peak Mining District Site.

FOR THE U.S. DEPARTMENT OF THE INTERIOR:

**AARON  
MOODY**

Digitally signed by AARON  
MOODY  
Date: 2021.12.22 12:58:41  
-05'00'

\_\_\_\_\_  
Dated

\_\_\_\_\_  
AARON MOODY  
Associate Solicitor  
U.S. Department of the Interior  
Office of the Solicitor  
Division of Land Resources  
1849 C Street, N.W., MS6412  
Washington, DC 20240

THE UNDERSIGNED PARTY enters into this Consent Decree in the matter of In re: Gold King Mine Release in San Juan County, Colorado on August 5, 2015, No. 1:18-md-02824-WJ, relating to the Bonita Peak Mining District Site.

FOR THE USDA FOREST SERVICE:

Dated: January 12, 2022

*For* **SANDRA WATTS** Digitally signed by SANDRA WATTS  
Date: 2022.01.12 11:26:56 -0700  
CHRISTOPHER B. FRENCH  
Deputy Chief, National Forest System  
USDA Forest Service  
1400 Independence Ave. SW  
Washington, DC 20250

THE UNDERSIGNED PARTY enters into this Consent Decree in the matter of In re: Gold King Mine Release in San Juan County, Colorado on August 5, 2015, No. 1:18-md-02824-WJ, relating to the Bonita Peak Mining District Site.

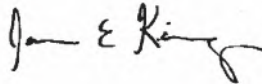
FOR THE STATE OF COLORADO:

Dated: 11/22/2021

  
\_\_\_\_\_  
JILL HUNSAKER RYAN

Executive Director  
Colorado Department of Public Health and Environment  
4300 Cherry Creek Drive South  
Denver, CO 80246

Approved as to form:

  
\_\_\_\_\_

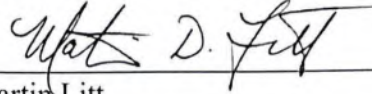
JASON E. KING\*  
Senior Assistant Attorney General  
Colorado Department of Law  
1300 Broadway, 7<sup>th</sup> Floor  
Denver, CO 80203  
jason.king@coag.gov

\*Counsel for the State of Colorado

THE UNDERSIGNED PARTY enters into this Consent Decree in the matter of In re: Gold King Mine Release in San Juan County, Colorado on August 5, 2015, No. 1:18-md-02824-WJ, relating to the Bonita Peak Mining District Site.

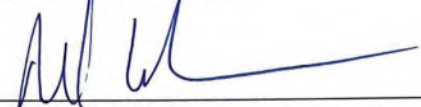
FOR SUNNYSIDE GOLD CORPORATION:

Dated: 11/4/2021



Martin Litt  
President & General Counsel  
Sunnyside Gold Corporation

Approved as to form:



Neil G. Westesen  
Counsel for Sunnyside Gold Corporation  
Crowley Fleck, PLLP  
P.O. Box 797  
Helena, MT 59624-0797  
Phone: (406)449-4165  
Email: [nwestesen@crowleyfleck.com](mailto:nwestesen@crowleyfleck.com)

THE UNDERSIGNED PARTY enters into this Consent Decree in the matter of In re: Gold King Mine Release in San Juan County, Colorado on August 5, 2015, No. 1:18-md-02824-WJ, relating to the Bonita Peak Mining District Site.

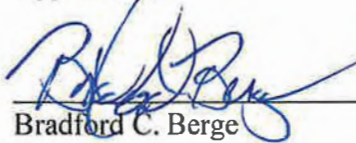
FOR KINROSS GOLD CORPORATION:

Dated: 11/4/21



Nathan Longenecker  
Senior Vice-President, Legal, and General Counsel  
Kinross Gold Corporation

Approved as to form:



Bradford C. Berge  
Counsel for Kinross Gold Corporation  
Holland & Hart LLP  
110 N Guadalupe, Ste 1  
Santa Fe, NM 87501  
Telephone: (505) 954-7284  
Email: bberge@hollandhart.com

## **SETTLEMENT AGREEMENT BETWEEN NEW MEXICO AND THE UNITED STATES**

WHEREAS, on May 23, 2016, the State of New Mexico, on behalf of the New Mexico Environment Department (“NMED”) (together, “New Mexico”), filed suit against the United States of America, the United States Environmental Protection Agency (“EPA”) and the Administrator of EPA (collectively, “the United States”) in the United States District Court for the District of New Mexico in a case captioned as *State of New Mexico v. USEPA*, et al., 1:16-cv-00465 (D.N.M.) (“the New Mexico Action”);

WHEREAS, New Mexico filed the New Mexico Action following the release, on August 5, 2015, of more than three million gallons of acid mine drainage containing heavy metals from the Gold King Mine located in San Juan County, Colorado, into downstream waters including the Animas and San Juan Rivers, which occurred during an EPA removal site evaluation;

WHEREAS, New Mexico brought claims against the United States pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (“CERCLA”) and the Federal Tort Claims Act, as well as a claim pursuant to the Clean Water Act that was subsequently dismissed;

WHEREAS, the New Mexico Action was consolidated as part of the multi-district litigation captioned as *In re Gold King Mine Release in San Juan County, Colorado on August 5, 2015*, 1:18-md-02824 (D.N.M.);

WHEREAS, EPA has listed the Bonita Peak Mining District Superfund Site (“BPMD”) encompassing the Gold King Mine on the National Priorities List under CERCLA;

WHEREAS, EPA has the authority and discretion to investigate and respond to releases or threatened releases of hazardous substances from the BPMD, and conduct removal and remedial actions at the BPMD, see 42 U.S.C. §§ 9604(a), 9621(a); 40 C.F.R. §§ 300.415, 300.430, 300.435;

WHEREAS, EPA is currently implementing CERCLA response actions to assess and respond to the commingled release of hazardous substances into surface water originating from historic mining activities within the BPMD;

WHEREAS, EPA is engaging with the State of New Mexico regarding the ongoing and planned response actions at the BPMD, which can extend to wherever contamination from the commingled release of hazardous substances from the mining-related source areas in the BPMD comes to be located; is assessing and characterizing downstream risks attributed to the commingled release of hazardous substances described above; and is providing the State of New Mexico meaningful and substantial involvement in CERCLA response actions taken at the BPMD, consistent with 40 C.F.R. Part 300.500(a), to address releases of hazardous substances from the BPMD causing an unreasonable risk to human health or the environment;



WHEREAS, if additional information becomes available that indicates BPMD-related contamination is posing risks to human health or the environment outside the scope of EPA's current investigations, including, for example, if NMED provides additional information to EPA showing risks in New Mexico that may be attributable to BPMD-related contamination, then EPA intends to assess that information and evaluate whether, in EPA's discretion, further action may be appropriate;

WHEREAS, EPA has developed a BPMD Community Involvement Plan and intends to update and revise it, and its associated appendices, as appropriate; and EPA remains willing to receive public input from New Mexico stakeholders;

WHEREAS, consistent with the BPMD Community Involvement Plan, EPA strives to provide community members with accurate, timely, and understandable information about BPMD site-related activities that reflect community communication preferences and culture, and EPA expects to provide community members with opportunities for involvement in site-related activities;

WHEREAS EPA has updated its Bonita Peak Mining District Alert and Notification Plan Standard Operating Procedure to ensure that contacts identified by New Mexico are timely notified in the event of actual or potential changes to the appearance or quality of water in the Animas River stemming from the BPMD Site; and EPA intends to periodically update the Alert and Notification Plan as necessary to accurately reflect current NMED personnel, as provided by New Mexico to EPA, with such updates occurring no more than twice annually; and

WHEREAS, New Mexico and the United States (the "Settling Parties") have determined that settlement of the New Mexico Action, without any admission of liability as to any factual or legal issue, is in the public interest and in the interest of the Settling Parties, and is the most appropriate means of resolving the New Mexico Action;

NOW, THEREFORE, New Mexico and the United States hereby agree to the following:

## 1. **Definitions**

Any term in the Settlement Agreement that is defined in CERCLA shall have its statutory meaning pursuant to CERCLA unless otherwise expressly defined below:

- a. **August 2015 Gold King Mine Release** shall mean the release described in the allegations of Paragraph 1 of New Mexico's Second Amended Complaint, ECF 339, in the New Mexico Action.
- b. **BPMD or Bonita Peak Mining District** shall mean the Bonita Peak Mining District Superfund Site in San Juan County, Colorado, EPA Docket ID No. EPA-HQ-OLEM-2016-0152, as published in the Federal Register on September 9, 2016, 81 Fed. Reg. 62397, including all areas of the Site that EPA has ever defined or described for purposes of or in relation to the National Priorities List, 40 C.F.R. Part 300, Appendix B, as of the Effective Date of this Settlement Agreement.

- c. **BPMD Community Involvement Plan** shall mean the Bonita Peak Mining District Superfund Site Community Involvement Plan (rev. Sept. 2019), *available at*: <https://semspub.epa.gov/work/08/100007750.pdf>.
- d. **BPMD Contamination** shall mean any releases or threatened releases of hazardous substances that occurred or are occurring on or before the Effective Date at or from mining-related sources in Colorado within the BPMD.
- e. **CERCLA** shall mean the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. §§ 9601-9675.
- f. **CERCLA Natural Resource Damages** shall mean any damages recoverable on behalf of the public for injury to, destruction of, or loss or impairment of Natural Resources as set forth in 42 U.S.C. § 9607(a)(4)(C), including but not limited to: (i) the costs of assessing such injury, destruction, loss of use, or impairment; (ii) the costs of restoration, rehabilitation, or replacement of injured or lost Natural Resources or of acquisition of equivalent resources; (iii) the costs of identifying, planning, implementing, and monitoring such restoration, rehabilitation, replacement or acquisition activities; (iv) compensation for injury, destruction, loss of use, or impairment of Natural Resources; and (v) each of the categories of recoverable damages described in 43 C.F.R. § 11.15 and/or the New Mexico Natural Resources Trustee Act.
- g. **Effective Date** shall mean the date on which the Settlement Agreement is signed by both New Mexico and the United States.
- h. **EPA** shall mean the United States Environmental Protection Agency.
- i. **FTCA** shall mean the Federal Tort Claims Act, 28 U.S.C. §§ 1346(b), 2671-2680.
- j. **Escrow Account** shall mean the account identified in Paragraph 3 of this Settlement Agreement and Attachment A hereto, which shall be used and managed in accordance with that Paragraph.
- k. **Long-Term Monitoring** shall mean those response actions within the State of New Mexico set forth in the “Gold King Mine Spill Long-Term Monitoring Plan” as published by New Mexico’s Long-Term Impact Team on May 5, 2017, a true and correct copy of which is attached to this Settlement Agreement as Attachment B.
- l. **Natural Resources** shall have the meaning provided in 42 U.S.C. § 9601(16).
- m. **New Mexico** shall mean the State of New Mexico and all of its agencies, instrumentalities and officers, including but not limited to the New Mexico Office of the Attorney General, the New Mexico Environment Department, and the New Mexico Office of Natural Resources Trustee.
- n. **New Mexico Action** shall mean *State of New Mexico v. USEPA*, et al. (1:16-cv-00465 (D.N.M.)) consolidated in the multi-district litigation for pre-trial purposes in *In re Gold*

*King Mine Release in San Juan County, Colorado on August 5, 2015* (1:18-md-02824 (D.N.M.)).

- o. **NMED** shall mean the New Mexico Environment Department.
  - p. **Restoration Plan** shall mean a plan for use by New Mexico of some or all of the funds paid into the Escrow Account by the United States pursuant to Paragraph 3, that has been adopted consistent with the requirements of 42 U.S.C. § 9611(i) and 43 C.F.R. § 11.93.
  - q. **Settling Parties** shall mean New Mexico and the United States. **Settling Party**, when used in the singular, shall mean either New Mexico or the United States.
  - r. **“Timely submitted”** applications, for purposes of Paragraph 6, shall mean applications by New Mexico for Clean Water Act section 106 funding or Superfund Subpart O funding that are submitted to EPA no later than 180 days after the Effective Date of this Settlement Agreement.
  - s. **United States** shall mean the United States of America and all of its agencies, instrumentalities and officers, including but not limited to EPA.
  - t. **Uranium Mine Reclamation Coordinators** shall mean those persons serving in the positions of Uranium Mine Reclamation Coordinator at NMED and at the New Mexico Energy, Minerals and Natural Resources Department, respectively, pursuant to 2022 N.M. Laws, ch. 26, § 1 and 2.
2. **Payment for New Mexico’s CERCLA response costs and enforcement costs.** As soon as reasonably practicable after the Effective Date of this Settlement Agreement, the United States shall pay to New Mexico the sum of \$18,100,000. This amount shall be expended for costs and fees and/or in the sole discretion of the Attorney General to address harms to New Mexico and its communities resulting from the release and to enhance the Office’s law enforcement efforts to prevent and prosecute environmental contamination. Payment to New Mexico under this Paragraph 2 shall be in the form of an electronic funds transfer per instructions that New Mexico shall provide to the United States no later than the Effective Date.
3. **Payment for CERCLA natural resource damages.**
- a. As soon as reasonably practicable after the Effective Date of this Settlement Agreement, the United States shall pay the sum of \$10,000,000 by electronic funds transfer into the Escrow Account.
  - b. New Mexico and the United States agree that all funds disbursed from the Escrow Account shall be utilized by New Mexico’s Natural Resources Trustee for purposes consistent with CERCLA’s authorized uses of recovered damages as specified in 42 U.S.C. § 9607(f)(1), pursuant to a publicly reviewed Restoration Plan as set forth in 42 U.S.C. § 9611(i) and the CERCLA Natural Resource Damage Assessment and Restoration regulations at 43 C.F.R. § 11.93. This Paragraph 3.b applies only to the use

of the sum paid into the Escrow Account by the United States pursuant to Paragraph 3.a. Neither Paragraph 3.b nor any other term of the Settlement Agreement limits New Mexico's discretion with respect to the use of the sum paid to New Mexico by the United States pursuant to Paragraph 2.

- c. For purposes of this Settlement Agreement, New Mexico and the United States agree that a Restoration Plan consistent with Paragraph 3.b may provide for the use of funds disbursed from the Escrow Account for any or all of the following non-exclusive list of program activities within the State of New Mexico:
    - i. River/Watershed Assessment and Restoration (including drinking water protection, pollution source control and mitigation);
    - ii. Land and Habitat Conservation and Restoration; or
    - iii. Public Education Campaign regarding Natural Resources impacted by the release or threatened release of hazardous substances at or from the Gold King Mine or the Bonita Peak Mining District.
  - d. New Mexico and the United States further agree that, to avoid double recovery under 42 U.S.C. § 9614(b), funds from the Escrow Account shall not be used to pay for costs of Long-Term Monitoring.
4. **Payment for Fed. R. Civ. P. 37(e)(1) attorney's fees and costs.** As soon as reasonably practicable after the Effective Date of this Settlement Agreement, the United States shall pay to New Mexico the sum of \$400,000 to resolve New Mexico's claim for "all reasonable attorneys' fees and costs associated with investigating the Federal Parties' spoliation and preparing [its Motion] for sanctions," ECF No. 1206, filed May 24, 2021 in *In Re Gold King Mine Release*, No. 1:18-MD-02824-WJ (D.N.M.). ECF No. 1292 at 13-14 (Mem. Opinion and Order dated Aug. 6, 2021). Payment to New Mexico under this Paragraph 4 shall be in the form of an electronic funds transfer per instructions that New Mexico shall provide to the United States no later than the Effective Date.
5. **Interest accrual.** If payment by the United States to New Mexico pursuant to Paragraphs 2 or 4 or to the Escrow Account pursuant to Paragraph 3 is made later than 120 days after the Effective Date, such payment shall include interest at the rate then prescribed pursuant to section 107(a) of CERCLA, running from the Effective Date.
6. **EPA action on grant application/s submitted by New Mexico.** As soon as reasonably practicable following the Effective Date of this Settlement Agreement, and no later than 180 days following the Effective Date, New Mexico shall submit to EPA eligible grant application/s for up to \$1,000,000 in Clean Water Act section 106 funding and up to \$2,500,000 in Superfund Subpart O funding. New Mexico shall make best efforts to submit all such eligible applications within 90 days following the Effective Date, and shall ensure that each such application clearly identifies this Agreement. EPA shall evaluate New Mexico's timely submitted grant application/s (which could include an application for supplemental funding for a preexisting grant or cooperative agreement) to determine their

consistency with applicable statutory, regulatory, and program policy requirements, including any cost share. Upon completing its evaluation, EPA shall take action on such application/s. EPA anticipates that it will provide \$1,000,000 in Clean Water Act section 106 grant funding and \$2,500,000 in Superfund Subpart O cooperative agreement funding, depending on submission of eligible application/s that is/are consistent with the authorities under which they would be funded, including applicable statutory, regulatory, and program policy requirements, and availability of funds. Nothing in this Agreement shall be construed to require EPA to approve or award funds in response to an application that is ineligible or otherwise inconsistent with such authorities, to award funding in any amount greater than anticipated as described in this Paragraph, or to take any action in response to an application that is not timely submitted. EPA shall make best efforts to take action on each timely submitted application no later than 90 days following EPA's receipt of such submission from New Mexico.

**7. Federal Action Commitments.**

- a. Each year for the next three years (2022, 2023, and 2024), and no later than the 30th of September in both 2023 and 2024, EPA will offer to conduct a virtual annual informational meeting for NMED to review and discuss ongoing efforts at the BPMD. EPA reserves the right to combine this annual meeting with other annual meetings that EPA may host with Utah, Navajo Nation, and other downstream governmental stakeholders.
- b. Within twelve months after the Effective Date of this Settlement Agreement, EPA will issue a New Mexico-focused appendix to its existing BPMD Community Involvement Plan and post the appendix to its public webpage for the BPMD site.
- c. EPA hereby identifies the office director of EPA's Office of Mountains, Deserts, and Plains, as NMED's primary point of contact at EPA for the purpose of coordination with New Mexico's Uranium Mine Reclamation Coordinators and, as appropriate, other federal, state and tribal stakeholders, regarding issues associated with legacy contamination from uranium mine and mill sites, beginning on the Effective Date of this Settlement Agreement and continuing until December 31, 2024. Each Settling Party retains its sole discretion to terminate or re-designate its representative for this point of contact for any reason, with prior notice to the other Settling Party.

**8. Availability of funds.** Payments to be made and actions to be taken by the United States pursuant to this Settlement Agreement are subject to the availability of funds appropriated for such purpose. No provision of the Agreement shall be interpreted as or constitute a commitment or requirement that the United States obligate or pay funds in contravention of the Anti-Deficiency Act, 31 U.S.C. § 1341, or any other applicable provision of law.

**9. The Settling Parties' releases and covenants not to sue.**

- a. New Mexico hereby releases, discharges, and covenants not to assert any and all claims of any kind that it may have had, or may now or hereafter have, against the United States

based on matters which were asserted or could have been asserted by New Mexico in the New Mexico Action, or on matters which New Mexico hereafter could assert in an action against the United States for CERCLA Natural Resource Damages resulting from BPMD Contamination or the August 2015 Gold King Mine Release. New Mexico's release and covenant not to sue the United States shall take effect on the date that all of the following conditions subsequent to the Effective Date have occurred: (i) The United States has made all payments required by Paragraphs 2, 3 and 4, including payment of any interest required by Paragraph 5; and (ii) EPA has taken action on all timely submitted grant applications in accordance with Paragraph 6, provided, however, that if New Mexico does not timely submit any eligible grant applications, then New Mexico's release and covenant not to sue the United States shall be deemed effective as of the date described in clause (i) of this sentence.

- b. The United States hereby releases, discharges, and covenants not to assert any claims of any kind that it may have had, or may now or hereafter have, against New Mexico based on matters which were asserted, or could have been asserted, by the United States in the New Mexico Action. The United States' release and covenant not to sue New Mexico shall take effect on the same date that New Mexico's release and covenant not to sue the United States takes effect.
- c. This Settlement Agreement does not resolve and is without prejudice to, and the United States hereby expressly reserves, any and all rights with respect to liability of any person other than New Mexico to the United States for CERCLA Natural Resource Damages.

#### **10. Stay of litigation and voluntary dismissal.**

- a. Within two business days after the Effective Date of this Settlement Agreement, the Settling Parties shall jointly move for an indefinite stay of all further judicial proceedings in the New Mexico Action with respect to claims between New Mexico and the United States, with quarterly status reports to be provided to the court until such time as the claims are dismissed in accordance with Paragraphs 10.b-10.c.
- b. Subject to Paragraph 10.c, within 7 days after the United States has made the payments described in Paragraphs 2, 3 and 4, including payment of any interest required by Paragraph 5, New Mexico shall file a stipulation (i) voluntarily dismissing with prejudice its pending FTCA claims against the United States and EPA in the New Mexico Action; and (ii) voluntarily dismissing without prejudice all other claims against the United States and EPA in the New Mexico Action.
- c. If, by the stipulation filing date described in Paragraph 10.b, New Mexico has already submitted the grant applications contemplated in Paragraph 6 and EPA has taken action on them, then the stipulation filed pursuant to Paragraph 10.b shall be for voluntary dismissal with prejudice of all claims of New Mexico against the United States and EPA in the New Mexico Action including both FTCA and CERCLA claims.



- 11. No admission of liability.** This Settlement Agreement shall not constitute or be construed as an admission by either Settling Party with respect to any question of fact or law raised by any claim or defense in the New Mexico Action, nor is it an admission of violation by either Settling Party of any law, rule, regulation or policy.
- 12. No effect on third parties.** Nothing in this Settlement Agreement shall bind, obligate, or otherwise create any rights or duties applicable to or enforceable by, or impose any limitations or conditions upon, any person or entity that has not signed the Agreement, nor shall the Agreement be construed to make such person or entity a third-party beneficiary of the Agreement.
- 13. No effect on claims and defenses other than between New Mexico and the United States.** This Settlement Agreement does not resolve and is without prejudice to, and each Settling Party expressly reserves, any and all rights with respect to claims and defenses between each Settling Party and any third parties, specifically including but not limited to the rights (1) to depose Alexas Gilbert and Michael Rhodes, as permitted by ECF No. 1646, filed May 15, 2022, in *In re Gold King Mine Release in San Juan County, Colorado on August 5, 2015*, 1:18-md-02824 (D.N.M.); (2) to cross-examine witnesses called by the United States during the evidentiary hearing that the Court has ordered will occur after June 17, 2022 and before trial; and (3) to introduce any testimonial or other evidence related to spoliation of evidence during trial proceedings in the New Mexico Action, and to object to such testimonial or other evidence.
- 14. Notices.** Any notices in required under the Settlement Agreement shall be provided in writing, via electronic mail, as follows:
- As to New Mexico:
- New Mexico Office of the Attorney General  
Consumer and Environmental Protection Division  
Attn: William Grantham  
Assistant Attorney General  
408 Galisteo Street  
Villagra Building  
Santa Fe, NM 87501  
Email: [wgrantham@nmag.gov](mailto:wgrantham@nmag.gov)
- New Mexico Environment Department  
Office of General Counsel  
Attn: Bruce C. Baizel, General Counsel  
PO Box 5469  
Santa Fe, NM 87502-5469  
Email: [Bruce.Baizel@state.nm.us](mailto:Bruce.Baizel@state.nm.us)

As to the United States:

United States Environmental Protection Agency  
Office of General Counsel  
Attn: Elizabeth G. Berg, staff attorney  
Solid Waste and Emergency Response Law Office  
1200 Pennsylvania Ave NW (MC2366A)  
Washington, D.C. 20460  
Email: [berg.elizabethg@epa.gov](mailto:berg.elizabethg@epa.gov)

Chief, Environmental Defense Section  
United States Department of Justice  
P.O. Box 7611  
Washington, DC 20044  
Email: [brian.lynk@usdoj.gov](mailto:brian.lynk@usdoj.gov)  
(Communications shall refer to “DJ# 90-11-6-20816”)

15. **EPA discretion.** Nothing in this Settlement Agreement shall be construed to limit or modify the discretion accorded to EPA under general principles of administrative law, or under any other statutes, regulations or policies.
16. **Force majeure.** Each Settling Party shall promptly notify the other Settling Party if the notifying Settling Party believes that it will be unable to meet a schedule for action specified in Paragraphs 6 or 7 of this Settlement Agreement because of any of the following circumstances beyond its control: (a) a federal government shutdown or a state government shutdown in the State of New Mexico; (b) an extreme event that renders EPA or NMED staff unable to complete the work needed to meet the schedule for the specified action; or (c) a catastrophic environmental event (e.g., a natural disaster or environmental accident) that results in the necessary diversion of EPA or NMED staff resources away from the work needed to meet the schedule for the specified action. In such circumstances, any resulting inability of EPA or NMED to meet the specified schedule for action shall not constitute a failure to comply with the terms of this Agreement, and the date so affected shall be extended by one business day for each day of the unavoidable delay, unless the Settling Parties agree to a longer period. If a Settling Party invokes this provision, it shall provide the other Settling Party with reasonable notice and explanation for any unavoidable delay.
17. **Amendments.** Except as provided in Paragraph 15, this Settlement Agreement may only be amended by subsequent written and signed agreement of the Settling Parties.
18. **Complete agreement.** This Settlement Agreement was negotiated between New Mexico and the United States in good faith and at arm’s length, and contains all terms and conditions agreed upon by the Settling Parties. Any statements or representations, oral or otherwise, between the Settling Parties or their respective counsel that are not expressly included herein are specifically superseded by this Agreement and shall have no force or effect. The Settling

Parties hereby agree that any and all rules of construction to the effect that ambiguity is construed against the drafting party shall be inapplicable in any dispute concerning the terms, meaning or interpretation of this Agreement.

19. **Counterpart original agreements.** This Settlement Agreement may be executed in any number of counterpart originals, each of which shall be deemed an original agreement and all of which shall constitute one agreement. The execution of one counterpart by either Settling Party shall have the same force and effect as if that Settling Party had signed all other counterparts.

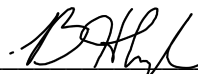
20. **Settlement authority.** Each individual signing this Settlement Agreement on behalf of a Settling Party hereby certifies that such individual has been duly authorized to bind such Settling Party to this Agreement by signing it.

FOR THE UNITED STATES OF AMERICA, THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, AND USEPA ADMINISTRATOR MICHAEL REGAN:

June 14, 2022

TODD KIM  
Assistant Attorney General  
Environment & Natural Resources Division

By:

  
BRIAN H. LYNK  
Trial Attorney  
Environmental Defense Section  
United States Department of Justice  
P.O. Box 7611  
Washington, D.C. 20044

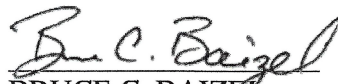
/s/ Adam Bain  
ADAM BAIN  
Senior Trial Counsel  
Civil Division, Torts Branch  
United States Department of Justice  
P. O. Box 340  
Washington, D.C. 20044

FOR THE STATE OF NEW MEXICO, THE NEW MEXICO ENVIRONMENT  
DEPARTMENT, AND THE NEW MEXICO OFFICE OF NATURAL RESOURCE TRUSTEE,  
AND AUTHORIZED BY THE NEW MEXICO ATTORNEY GENERAL:

June 14, 2022



CHOLLA KHOURY  
Chief Deputy Attorney General  
Civil Affairs  
New Mexico Attorney General  
408 Galisteo Street  
Villagra Building  
Santa Fe, NM 87501



BRUCE C. BAIZEL  
General Counsel  
New Mexico Environment Department  
PO Box 5469  
Santa Fe, NM 87502-5469



MAGGIE HART STEBBINS  
Natural Resources Trustee  
New Mexico Office of Natural Resources Trustee  
121 Tijeras Avenue, NE, Suite 1000  
Albuquerque, New Mexico 87102

# **Attachment A**

**UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF NEW MEXICO**

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IN RE: GOLD KING MINE RELEASE IN SAN	)	
JUAN COUNTY, COLORADO, ON AUGUST 5,	)	C.A. No. 1:18-md-02824-WJ
2015	)	

*This Document Relates to all cases.*

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**ATTACHMENT A  
TO SETTLEMENT AGREEMENT BETWEEN UNITED STATES AND NEW MEXICO**

In accordance with Paragraphs 1(j) and 3 of the Settlement Agreement, “Escrow Account” as used in the Settlement Agreement means an interest bearing court registry account of the United States District Court for the District of New Mexico (“Court”), established pursuant to an order of the Court. Payment to the Court registry account shall be made in the manner specified by the clerk of the Court, subject to Paragraphs 3 and 5 of the Settlement Agreement. Payments from the Court registry account shall be made in accordance with Paragraph 3.

In the event that the court registry account described above is not available, New Mexico will designate in writing, with the prior consent of the United States, an account at a financial institution as the Escrow Account.



# **Attachment B**

# Gold King Mine Water Spill

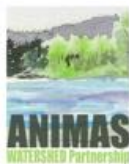
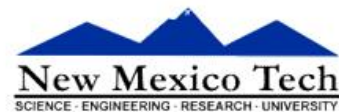
## Long-Term Monitoring Plan

May 5, 2017

Prepared by the New Mexico Long-Term Impact Team



New Mexico Department of Agriculture



San Juan Soil and Water Conservation District



## Message from New Mexico Environment Secretary Butch Tongate



Shortly after the August 5, 2015 Gold King Mine (GKM) spill, Governor Susana Martinez appointed a team to monitor and assess the Long-Term impacts of the spill. The state-led team includes top science and engineering experts from executive agencies and other organizations in New Mexico. During 2016, the team conducted extensive testing of river water, sediment, well water, treated drinking water, fish tissue, and crop tissue. Seasonal water-level surveys were conducted to identify areas where river water may be seeping into alluvial groundwater. Sondes were installed in the Animas River to continuously monitor water quality, and to inform decisions by public water systems on closing water intakes during times of high flow and potential contamination.

A Citizens' Advisory Committee (CAC) was seated to provide community oversight and input on the Long-Term monitoring and response to the spill. New Mexico spearheaded efforts to develop a 2016 Spring Runoff Preparedness Plan bringing three states, three tribes, and numerous county and municipal agencies on board for collaborative success throughout the watershed. An Exposure and Risk Dashboard was developed to clearly and briefly convey contamination conditions, contaminant exposure pathways, and risks to the general public. Numerous technical papers and presentations were the highlights of a well-attended two-day conference on water quality conditions in the Animas and San Juan Rivers held in Farmington.

To keep the responsible parties accountable, the State of New Mexico filed lawsuits against the U.S. Environmental Protection Agency (EPA), several mining companies and the State of Colorado. While New Mexico supports EPA's inclusion of the Bonita Peak Mining District (which includes the GKM) in the National Priorities List as a Superfund site, we also demand that EPA use sound science, be honest with the public, and treat residents downstream from Colorado as stakeholders in the Superfund process. Unfortunately, EPA's recent decision to reject all GKM damage claims contradicts their earlier enthusiastic distribution of claims forms and assertions that affected parties would be made whole through the claims process. These inconsistent actions provide little hope that EPA, a responsible party for the spill, will hold itself to the same standards that it has long required of private citizens.

We look forward to continue working together with our New Mexico stakeholders to protect our unique environment.

Yours truly,

Butch Tongate  
Secretary- New Mexico Environment Department

## **Introduction**

The Gold King Mine (GKM) is located in the upper Animas watershed near the town of Silverton in the San Juan Mountains of southwestern Colorado, and was in operation from approximately 1887 until 1922. The GKM is one of some 400 abandoned or inactive mines in the San Juan Mountains. Acid rock drainage (ARD) forms when geologic minerals undergo oxidation and release sulfuric acid and dissolved metals into water. For the purpose of this Long-Term Monitoring Plan, ARD is meant to include drainage from both undisturbed naturally occurring minerals and ore bodies as well as drainage from mine workings. ARD from the ore bodies and from some of the mine workings impacted water quality in the Animas River and in many of its tributaries. The GKM, however, was not a source of ARD when mining operations ceased in 1922. Seepage of ARD from the GKM began after bulkheads were installed at other mine workings in the area, in the late 1990s to early 2000s, in an effort to control ARD. The bulkheads caused groundwater to become impounded and rise into previously unsaturated natural geologic fractures and mine workings, such as adits. Adits are horizontal, or nearly horizontal, passages from the surface by which a mine is entered, and can be used to dewater and ventilate mine workings. Flooded mine workings, including adits at the GKM, became sources of ARD seepage that did not exist prior to installation of the bulkheads. The U.S. Environmental Protection Agency (EPA) and the State of Colorado took actions to investigate and alleviate these newly created seeps of ARD.

On August 5, 2015, an EPA work crew digging into the GKM Level 7 adit triggered a blowout and continuous discharge of impounded mine water. The EPA afterwards reported that more than 3 million gallons of acidic mine water containing sediment, heavy metals, and other chemicals discharged into Cement Creek, an Animas River tributary near Silverton, Colorado. The plume flowed down the Animas River, and into New Mexico where the Animas River joins the San Juan River which flows into the Navajo Nation and Utah.

The New Mexico Environment Department (NMED), the New Mexico Office of the State Engineer (OSE), the New Mexico Department of Health (NMDOH), the New Mexico Department of Agriculture (NMDA), the New Mexico Department of Game and Fish (NMDGF), the New Mexico Department of Emergency Management and Homeland Security, and San Juan County coordinated an emergency response to ensure that public health and safety were protected. Governor Susana Martinez declared an emergency, authorizing the use of up to \$750,000 in emergency funds as part of emergency response and follow-up actions.

Response actions provided benefits for impacted communities in New Mexico by immediately addressing impacts from the GKM spill. The State of New Mexico (State) is continuing GKM related support efforts through the Governor-appointed multi-agency Long-Term Impact Review Team (LTIRT or Team) to implement long-term monitoring and control of contaminated water and sediment, to communicate risk and to mitigate effects of hazardous waste migrating from the Superfund site.

The Governor-appointed multi-agency LTIRT includes New Mexico state agencies responsible for the Environment, Health, Game & Fish, Agriculture, Homeland Security and Office of the State Engineer. This team provides inter-disciplinary expertise and technical support in the Animas and San Juan River basins on a watershed scale level. The Team recruited top science and engineering experts from state universities, the N.M. Bureau of Geology and from the U.S. Geological Survey, along with experts from local governments to serve on the GKM Long-Term Monitoring Technical Consortium (GKM LTMTTC), a working sub-group of the LTIRT led by NMED. NMED also coordinates with the GKM LTMTTC and adjacent states affected by the GKM spill to enhance data collection (i.e., monitoring), to leverage analyses and strengthen results.

The GKM LTMTTC held a series of conference calls, meetings and extensive outreach activities including public meetings to collaboratively identify key issues and develop the Long-Term Monitoring Plan (LTMP 2016) as the first step towards consolidating and prioritizing the State's Phase II post-GKM blowout efforts. The LTMP 2016 was prepared by the executive agencies on the Long-Term Impact Team in collaboration with New Mexico State University (NMSU), the New Mexico Water Resources Research Institute (WRRI), New Mexico Tech, the New Mexico Bureau of Geology and Mineral Resources, the University of New Mexico (UNM), San Juan County, the City of Farmington, and the San Juan Soil and Water Conservation District. The draft LTMP 2016 was released for public comment during October 20 through November 20, 2015, and finalized on April 4, 2016. The LTMP 2016 is a dynamic document focusing on water quality, sediment, agriculture, human health and wildlife, and is subject to data-driven modifications as observations and test results become available. The NMED coordinated with the GKM LTMTTC to complete updates to the elements as presented in this LTMP 2017.

Activities related to the LTMP accomplished during 2016 are described below. Funding has been awarded that supports, in part, five elements from the LTMP 2016: Element #6 Water Table Mapping; Element #7 Groundwater Quality Monitoring; Element #10.1 Aquatic and Riparian Habitat Assessment; Element #12.2 Informational Conference and Element #13 Community Outreach and Involvement.

## **2016 LTMP Accomplishments**

### **Long-Term Monitoring**

1. NMED signed a Joint Funding Agreement with the U.S. Geological Survey to install four sondes in the Animas and San Juan Rivers to provide continuous water-quality measurements. Real time data from the sondes are available from the USGS website (<https://waterwatch.usgs.gov/>).
2. The City of Farmington installed and maintains two sondes in the Animas River at the location of each of their drinking water supply intakes.

3. The NM Bureau of Geology, pursuant to a Memorandum of Agreement with NMED, conducted three seasonal surveys of groundwater elevations and groundwater chemistry. Localized areas where the river water appears to be seeping into groundwater, at least on a seasonal basis, were discovered in some areas north of Aztec. These areas will be targeted for more intensive sampling. To date, however, testing of private domestic water wells has not detected any contamination attributable to the GKM spill.
4. NMED spearheaded efforts to develop a Spring Runoff Preparedness Plan that was signed by three states, three tribes, and numerous county and municipal agencies. NMED also conduct preparedness training that was attended by first responders from New Mexico, the Navajo Nation, and Colorado.
5. UNM conducted mineralogical testing of solids that were released during the GKM spill and published a paper of test results in the Journal of Environmental Science and Technology. The mineral jarosite, which formed inside the GKM and was released during the spill, plays a significant role in transporting and releasing heavy metals in the river system. (Rodriguez-Freire, et al, 2016c).
6. NMDOH conducted biomonitoring sampling in San Juan County involving testing the well water and urine of county residents for heavy metals.
7. NMED purchased a portable X-ray fluorescence spectrometer (XRF) and conducted an initial survey of heavy metals in sediment along Cement Creek, and the Animas and San Juan Rivers.
8. NMSU began testing crop tissue for heavy metals. Preliminary test results do not show high concentrations of metals.
9. NMDGF completed two surveys of edible fish tissue showing that heavy metals are within guidelines for human consumption.
10. The City of Aztec discovered a layer of lead-contaminated alluvial aquifer sediment that appears to reflect river seepage into groundwater. Additional investigation is planned, and will include more intensive testing of water wells and crops in this area. See also Figure 6 on page 12.

### **Public Involvement and Other Activities**

11. NMED appointed a Citizens' Advisory Committee (CAC) to provide community oversight and input on monitoring and other activities. The CAC established its leadership, operating rules, and conducted monthly meetings during 2016.



12. NMED developed an Exposure and Risk Dashboard to communicate contamination conditions, potential contaminant exposure pathways, and associated risks to the public.  
<https://www.env.nm.gov/wp-content/uploads/2016/01/Animas-San-Juan-Risk-Dashboard.pdf>
13. WRRI, with assistance from the entire team, planned and conducted a two-day conference on water quality conditions in the Animas and San Juan Rivers. The conference was well attended with numerous technical papers and presentations.

### ***Implementing New Mexico's Long-Term Monitoring Plan for GKM Spill Activities***

#### **Conceptual Model**

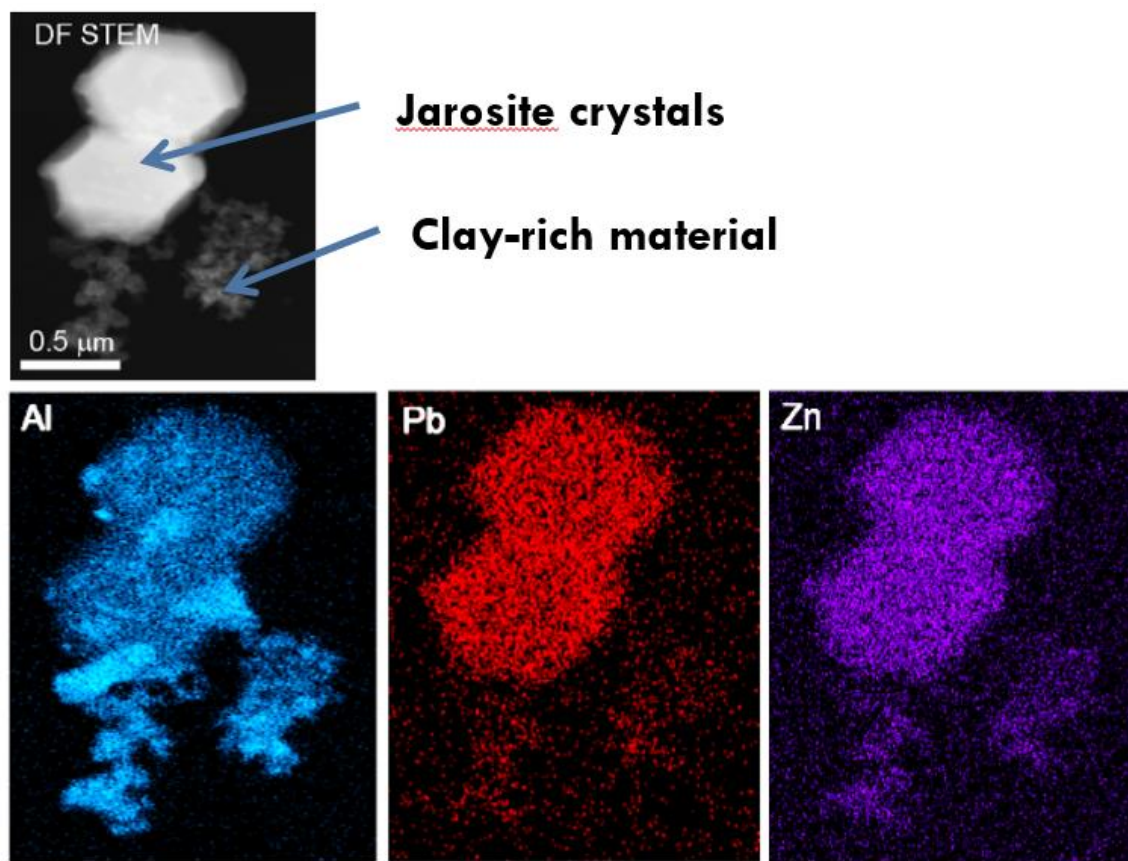
The geology, ore deposits, and ARD in the watershed surrounding Silverton, Colorado area are discussed in great detail by the papers contained in Church et al. (2007). The discussion provided in this paragraph draws heavily from the work of those authors, particularly Stanton et al. (2007), Vincent et al. (2007), and von Gerard et al. (2007). The mountains surrounding the Silverton, Colorado area include two volcanic calderas that were intruded by hydrothermal fluids that created sulfur-rich, base-metal ore bodies enriched in copper, lead, silver, molybdenum, and zinc. Pyrite and other sulfide minerals in this region have undergone various degrees of bio-geochemical oxidation by natural geologic processes, resulting in the release of sulfuric acid and metals (ARD) into groundwater and surface water. Over the past 9,000 years, iron, aluminum, manganese, and other metals concentrated in ARD have precipitated and cemented near-surface sediments forming ferricrete. Cement Creek (Figure 1) was named after the widespread naturally occurring deposits of ferricrete in this watershed. These geologic deposits of ferricrete demonstrate that ARD has been occurring in this mineralized area long before mining began in the late 19th century.

The bio-geochemistry and mineralogy of the GKM is a dynamic system that is sensitive to physicochemical changes that took place during and after mining. Reactive solid phases precipitate from the oxidation and dissolution of sulfide minerals, including pyrite and chalcopyrite at the GKM. These phases commonly include ferric (oxy)hydroxide, gypsum, jarosite, and schwertmannite, which react with mine water producing an acidic metal-sulfate-rich solution. Acid rock drainage has high concentrations of dissolved and total calcium, magnesium, sodium, sulfate, iron, aluminum, manganese, and other metals that influence surface-water quality in the region. The mineral jarosite (Figure 2), which formed inside the GKM and was released during the spill, plays a significant role in transporting and releasing heavy metals in the river system (Rodriguez-Freire, 2016 c).

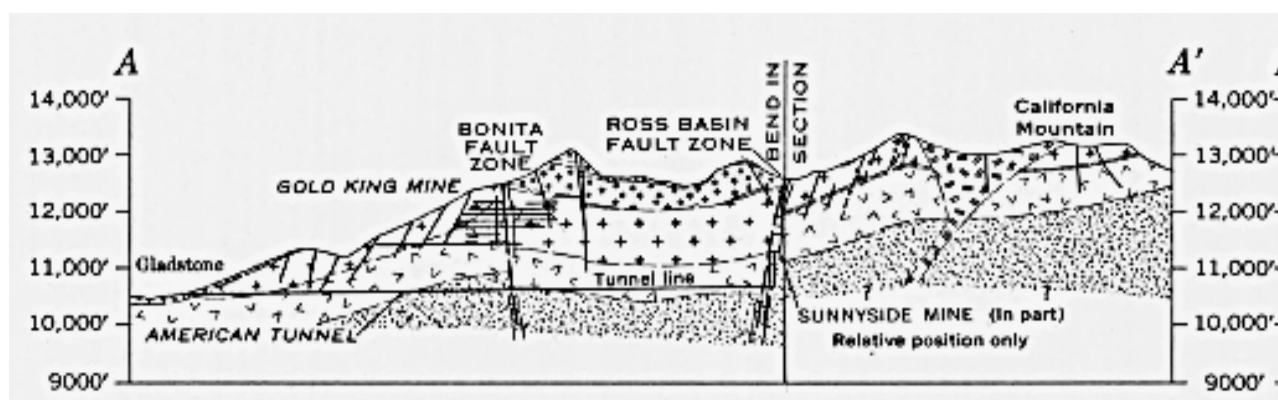


**Figure 1.** Ferricrete deposit in Cement Creek, CO. (From U.S. Geological Survey [photo gallery](#)) Excavation of mine tunnels drained groundwater from the mountain and allowed air to enter the ore zone, providing greater opportunity for the oxidation of sulfide minerals and production acidic mine water. There is no doubt that mining activity increased the amount of ARD entering the Animas watershed.

In the late 1990s and early 2000s, after mining operations had ceased, bulkheads were installed in the American Tunnel (Figure 3) and in other excavations in lower levels of the mine workings to control ARD seepage. After the bulkheads were installed, the water table in the mountain rose and flooded mine workings, such as GKM level 7, located at higher elevations, and created ARD seeps that did not exist prior to installation of the bulkheads (Sorenson and Brown, 2015).

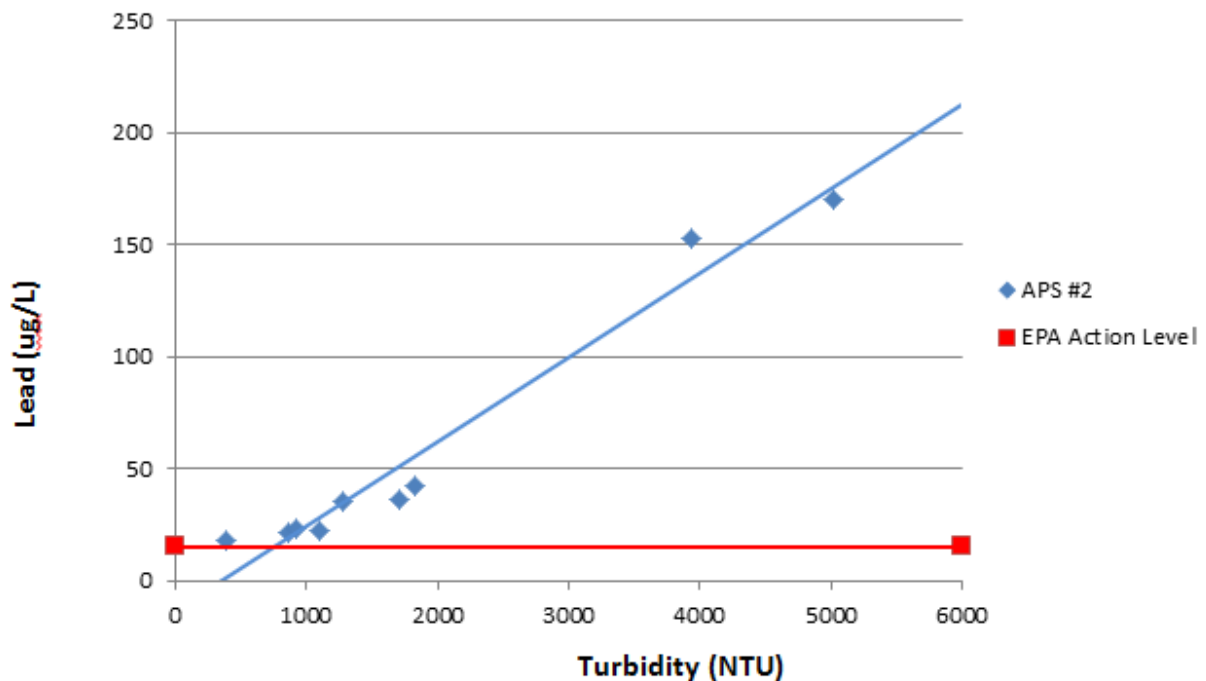


**Figure 2.** Jarosite grains containing aluminum, lead, zinc, and other metals that can be released as jarosite becomes unstable at higher pH.



**Figure 3.** Geologic Cross Section Through the Gold King Mine and American Tunnel.  
(From Burbank and Leudke, 1969, Plate 6)

Metals and other chemicals concentrated in Animas River water are transported in both the dissolved and suspended phases with the majority of the contaminant mass occurring in the suspended fraction. Adsorption, precipitation, and co-precipitation are the dominant processes controlling the chemistry and mineralogy of the suspended fraction. The ability of the Animas River to transport large volumes of suspended sediment is related to the steepness of the gradient, which directly controls flow velocity that decreases south of Silverton. The riverbed area downstream of where the gradient decreases is characterized by low-energy flow environments where mine-waste sediment and associated heavy metals may have deposited and accumulated for decades. Accumulation of contaminated sediments most likely presents significant long-term potential sources of heavy metal migration into New Mexico, especially during storm events and snowmelt where re-suspension of sediment occurs. Post-spill monitoring conducted by the City of Farmington has established a relationship between turbidity and total lead during high flow in the Animas River (Figure 4).



**Figure 4.** Turbidity and Total Lead, City of Farmington, Animas Pump Station #2, During High Flow.

Some homeowners who are not served by a public water system, especially those that do not have indoor plumbing or a private domestic well, haul water from the Animas or San Juan Rivers or from irrigation canals for domestic supply. This water likely undergoes minimal treatment; the NMED has previously issued advisories for at-home chlorination of water to disinfect. Without appropriate treatment, users of hauled surface water may be exposed to dissolved and suspended metals in their drinking water.



A review of historical monitoring data for public water systems that divert water from the Animas River provides no evidence that Primary Drinking Water Standards for metals have ever been exceeded in the drinking water delivered to consumers (N.M. Department of Public Health, 1967; Garcia and Olaechea, 1974; Garcia and Pierce, 1980). All of these public water supply systems utilize a sedimentation basin or reservoir, as well as a treatment system to further decrease suspended solids concentrations. Sedimentation and treatment provide significant protection for the subject drinking water against any suspended-phase heavy metals that may migrate from the Silverton mining area.

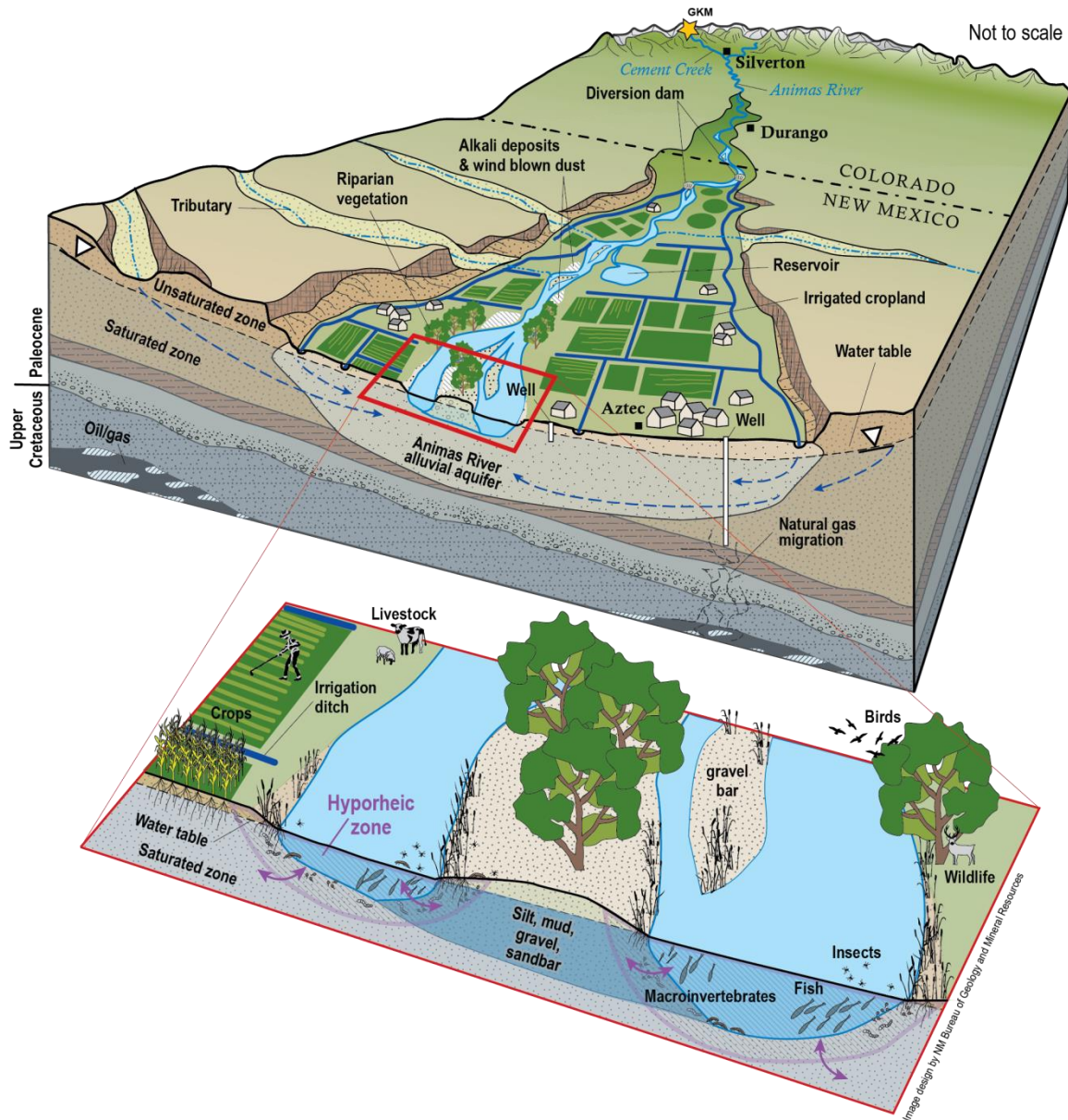
A conceptual illustration of the Animas River hydrologic system is shown in Figure 5. The Animas River valley alluvial aquifer in Colorado receives base flow from groundwater (Von Gerard et al., 2007). Seasonal surveys of groundwater elevations and groundwater chemistry since the GKM spill indicate that the Animas River also is primarily a gaining stream from the Colorado-New Mexico state line down to Farmington, NM where the Animas River joins the San Juan River (Timmons et al., 2016). Flow of circumneutral pH groundwater into the river provides a source of dilution of Long-Term ARD, and of historical mining waste spills that have occurred in the past.

While the Animas River is predominantly a gaining stream, river water diverted into irrigation ditches has the potential to recharge the alluvial aquifer in irrigated croplands and along the length of the ditches. Additionally, localized areas where river water appears to be seeping into groundwater, at least on a seasonal basis, were discovered in some areas near and north of Aztec (Timmons et al., 2016). A layer of lead-contaminated alluvial aquifer sediment that appears to reflect river seepage into groundwater was discovered along the east bank of the river near Aztec (Figure 6). Additional investigation of the origin, composition, and extent of this mineralized layer is needed.

Areas in the vicinity of this mineralized layer will be targeted for additional testing of well water and crops. To date, however, testing of private domestic water wells has not detected any contamination attributable to the GKM spill (Flynn et al., 2016; Timmons et al., 2016).

Alluvial groundwater typically contains a substantially higher concentration of total dissolved solids (TDS) compared to Animas River water. Potential sources of elevated groundwater TDS may include cation exchange, dissolution of soluble sulfate minerals present in the alluvium, evaporation of groundwater in waterlogged valley areas (as evidenced by “white alkali” accumulation, Figure 7), upwelling of mineralized groundwater from bedrock units underlying the alluvium, and discharges from onsite wastewater systems especially those that receive waste from salt-based water softeners.

Elevated concentrations of dissolved manganese and iron occur in some alluvial aquifer wells, and nitrate concentrations are typically low (less than 1 mg/L), indicating reducing conditions in those areas. Possible causes of these reducing conditions include oxidation of naturally occurring organic matter and/or sulfide minerals deposited in the alluvium, oxidation of thermogenic and biogenic natural gas that occurs in some areas of the alluvial aquifer (Chafin, 1994), and oxidation of reactive organic matter discharged by onsite wastewater systems.



**Figure 5.** Conceptual illustration of the Animas River Hydrologic System. Many of the potential pathways for contaminant migration discussed in this Long-Term Monitoring Plan are identified on this image. (Timmons et al., 2016).





**Figure 6.** Lead-Contaminated Mineral Layer Along the Water Table of the Alluvial Aquifer Near Aztec (March 2016).



**Figure 7.** “White alkali” in Flora Vista, NM (August 2015).

Microbes, algae, and plants that reside in or around rivers and streams obtain essential nutrients from the water and sediments for growth. Water and sediments that are contaminated with heavy metals (e.g., lead and arsenic) are also taken up by these organisms. Aquatic insects consume contaminated plants and microbes for food and accumulate (fat-soluble) metals in their tissues because they cannot be excreted. Thus, metals bioaccumulate exponentially at each step of the food chain; for example, when fish consume contaminated aquatic insects, concentrations of heavy metals can increase by several orders of magnitude in their tissues relative to microbes, plants, and aquatic insects. Likewise, when aquatic insect larvae hatch and move into riparian areas they are consumed by terrestrial predators like spiders and tiger beetles and thereby become available to terrestrial consumers like birds that also can exhibit exponential increases in metal concentrations.

The uptake of contaminants into the food web was documented in a detailed study of the migration and fate of radioactive contaminants discharged into the Animas River from the former uranium mill in Durango (Tsivoglou et al., 1960). Elevated levels of gross alpha, gross beta, and radium were detected in algae and in aquatic insects downstream from the mill.

## **Data Gaps**

- Historical and ongoing contaminant loadings to the Animas and San Juan watersheds
- Background-baseline contaminant concentrations in sediment and water caused by natural geologic sources and historical mining and milling
- Distribution and mass balance of contaminants in sediment and water
- Characterization of ground and surface water quality (metal speciation, stable isotopes, microorganisms)
- Aquifer-river-irrigation ditch hydraulics
- Origin, composition, and extent of alluvial water-table mineralized zone near Aztec
- Identify areas river water seeps into groundwater and near wells.
- Uptake of contaminants by plants, livestock, macro-invertebrates, fish, and wildlife
- Toxicological and ecological risk assessment
- Evaluate impacts of storm events on sediment, and ground and surface water quality
- Patterns of potential contaminant consumption by residents for human exposure pathways (discussed above)

## **LTMP Outline**

The overarching goals of the LTMP are to:

1. Identify the impacts of the August 5, 2015 spill on water quality and the environment in New Mexico and, to the extent possible, differentiate this from previous spills, historical acid mine drainage, and naturally occurring acid rock drainage over geological time; and
2. Generate the data needed to perform an assessment of potential exposure pathways and risks to public health, public and private drinking water sources, water-based recreation, livestock, irrigated agriculture, and fish and other wildlife.

To achieve these goals, specific monitoring elements are summarized below. The monitoring elements include work that the Long-Term Impact Review Team has determined needs to be performed. Detailed technical work plans have been developed for each of the technical monitoring elements and are summarized below. While some work plan projects have been funded, additional funding and resources are needed, to fully perform all of the monitoring proposed. The LTMP is dynamic and subject to data-driven modifications as observations and test results become available.

For the purpose of this monitoring plan, and based upon information presented in the previous sections, the following metals are of concern with regard to acid rock and mine

drainage and to the GKM spill: aluminum, arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, and zinc.

## **LTMP Elements**

### **1. Public Drinking Water Systems**

**Goals:** Determine if the GKM spill will have any impact on the water sources used by public water supply systems; ensure that public water systems deliver drinking water that complies with the National Primary Drinking Water Regulations, and monitor for accumulation of heavy metals in drinking-water treatment infrastructure.

#### **Actions:**

- Continue to monitor entry points of public water supply in accordance with compliance monitoring schedules and laboratory analyses required by the Safe Drinking Water Act (SDWA). If appropriate, increase sampling frequency in response to any detection of increased heavy metal concentrations in treated water being served. As needed, add source water monitoring, if raw water treatment is not adequate and metals detections at entry points do not comply with SDWA requirements or National Primary Drinking Water Regulations.
- Provide outreach and education at public meetings on source water protection (SWP) planning and offer individual assistance to each public water system with a drinking water source of supply in the Animas River watershed. Provide information and education on potential regional planning activities where multiple water systems protect sources of drinking water and plan for emergencies together.
- Continue real time monitoring at the City of Farmington (COF) source water intakes for turbidity, and take appropriate actions when turbidity increases to levels of concern to the COF.
- Develop and support a communication system that provides email notice to public water systems that divert water from the Animas River when turbidity levels in river water reach 200 NTU.
- Monitor sedimentation basins for evidence of heavy metal buildup.



## **2. Surface Water Quality**

**Goals:** Determine if surface-water quality has changed as a result of the GKM spill, and evaluate any changes with regulatory standards and criteria.

### **Actions:**

- Maintain field instrumentation installed at nine USGS stream gaging stations in the Animas and San Juan Rivers to monitor for turbidity, pH, specific conductance, and temperature.
- Continue making real-time data for turbidity, pH, specific conductance, and temperature provisionally available on the USGS Water Quality Watch website, along with flow rate which is already measured by USGS at the nine gaging stations and available on the WaterWatch website:  
<https://waterwatch.usgs.gov/>
- Maintain the real-time water-quality and flow data available through subscription e-mail and text alerts to public water systems and others who participate in the USGS Water Alert service, which sends automated messages when field measurements exceed specified levels.
- Manage nine ISCO auto-samplers and associated samples co-located with USGS gaging stations where water quality measurements are being collected.
- Support baseflow sampling correlated to surface water quality sampling for field parameters, total and dissolved solids, anions/cations, dissolved and total metals, suspended solids on filter paper for total metals, bacteria, bacteroides, nitrogen and phosphorus.
- Maintain a reverse-911 system to communicate alerts and relevant information on surface water quality to area irrigators and farmers. Triggers for alerts and information are based on analysis of data collected from the Animas and San Juan Rivers, including data collected at the USGS sondes locations.
- Maintain USGS sondes installed for high flow spring runoff events and support post-GKM spill event updates to USGS stream gaging stations in the Animas and San Juan Rivers (i.e., added monitoring for turbidity, pH, specific conductance and temperature). These locations are currently operational and the data can be accessed on the USGS WaterQualityWatch website mentioned above.

### **3. Sediment and Agricultural Sampling (Streams, Irrigation Ditches, Irrigated Croplands and Crops)**

#### **Goals:**

- Determine if elevated heavy metal concentrations presently occur in irrigation water and irrigation ditch sediment, and in soil and crops that have been irrigated with water diverted from the Animas River; and,
- Monitor the migration of contaminated surface water sediment from Colorado into New Mexico, as it pertains to irrigated agriculture and the river-agricultural land interface.
- Monitor and sample agricultural crops, and analyze for GKM heavy metals contaminants; compare to risk screening levels.

#### **Actions:**

- Initial and periodic future sampling, especially after runoff/storm events, of surface water sediment and irrigated soils and crops for heavy metals and evidence of increasing trends of metals concentrations migrating into New Mexico from Colorado.
- Facilitate coordination between ditch associations and public water systems to ensure that future irrigation ditch flushing does not adversely impact drinking water intakes.
- Facilitate coordination between ditch associations, grower groups, farmers' markets, farm boards, county, state and federal service providers and the public to ensure food and agriculture safety.

### **4. Annual X-Ray Fluorescence (XRF) River Sediment and Soil Survey**

**Goal:** Characterize the nature and extent of GKM-metals contaminated river sediment and soils. These data will supplement and enhance the existing dataset from the EPA, USGS, NMSU, Navajo Nation, Utah Department of Environmental Quality, Colorado Department of Health and the Environment and other stakeholders collected within the watershed historically and as part of the GKM spill response.

#### **Actions:**

- Collect soil and sediment samples along the length of the watershed from Cement Creek to the San Juan River on Navajo Nation.
- Conduct on-site (portable XRF) and off-site analysis on samples collected.
- Record sample site locations (i.e., GPS coordinates) and levels of GKM and mining-related metals in soil and sediment samples.



## **5. Solids Characterization**

**Goals:** Determine specific form of contaminants in GKM spill solids and assess likely release and re-release pathways to support other tasks in the monitoring plan. Characterize the nature and extent of metals-contaminated sediment.

**Actions:**

- Directly characterize solids and associated metals from water and sediment along the flow path of the GKM spill.
- Review solid characterization data for GKM site, surrounding mines, and mine waters to establish likely initial forms of solid contaminants.
- Assess the mobility, likely transformation and release of metals in GKM spill solids in different depositional environments.

Scientists on the GKM Long-Term Monitoring Technical Consortium (GKM LTMTTC) published a peer-reviewed scientific paper on this topic (Rodriguez-Freire, et al. 2016c).

## **6. Riverbed and Shallow Alluvium Interactions**

**Goals:** Evaluate the potential for transport, sequestration, and release of heavy metals in riverbed sediments and the shallow alluvium along the Animas and San Juan river corridor. Hydraulic and geochemical interactions between the river water column, riverbed sediments, and the shallow alluvial aquifer are quantified with: 1) a detailed compilation and reanalysis of existing well and surface water quantity and quality data in areas affected by the event; 2) synoptic sampling campaigns; and 3) installation of high-frequency monitoring sites.

**Actions:**

- Sample surface water, near-river wells, stream sediment, rock coatings, and hyporheic zone sediment and pore fluid at twenty sites from Cement Creek, CO, through NM, and into Bluff, UT for general chemistry and trace metals.
- Compilation and reanalysis of legacy data to establish a base-line to evaluate recovery.

## **7. Regional Groundwater Table Mapping and Groundwater Quality Monitoring**<sup>1, 2</sup>

**Goal:** Monitor groundwater quality conditions and levels over time to assess groundwater contamination resulting from the GKM spill.

**Actions:**

- Map and evaluate water quality and groundwater level data collected by EPA and other cooperators to support long-term groundwater quality monitoring decisions, including well selection and sampling schedule.
- Track groundwater to surface water interactions and flow path changes using a network of up to 25 data loggers that measure parameters at regular time intervals.
- Collect groundwater quality samples from up to 80 selected wells two times a year.
- Analyze data to assess spatial and temporal trends in groundwater quality, and to assess impacts from the GKM spill.

## **8. Ongoing and Potential Future Discharges in the Mining Area**

**Goal:** Identify and characterize ongoing and potential future discharges of mine waste into the Animas watershed.

**Actions:**

- Identify locations, volumes and chemical quality of water impounded in mine workings in the upper Animas watershed.
- Identify and chemically characterize ongoing mine water seeps and gauge flow rates.

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<sup>1</sup> Preliminary work for Element 7 was completed under Elements 6 and 7 of the LTMP 2016 and funded by EPA through June 30, 2017. Equipment purchased will be utilized for continued Long-Term regional groundwater monitoring of contamination resulting from the GKM spill.

<sup>2</sup> Scientists on the GKM Long-Term Monitoring Technical Consortium (GKM LTMTTC) published a peer-reviewed scientific paper on preliminary work relative to Elements 6 and 7: Timmons, S., et al. 2016, *Groundwater Monitoring along the Animas River, New Mexico: Summary of Groundwater Hydraulics and Chemistry from August 2015 to June 2016*. New Mexico Bureau of Geology and Mining Resources Aquifer Mapping Program Publication Final Technical Report September 2016. This paper is available online at: [https://geoinfo.nmt.edu/resources/water/amp/brochures/FTR\\_Animas\\_River\\_Sept\\_2016\\_LR.pdf](https://geoinfo.nmt.edu/resources/water/amp/brochures/FTR_Animas_River_Sept_2016_LR.pdf)

- Identify locations of waste rock and mill tailings piles that have the potential to discharge into surface water.

## **9. Airborne Dust**

**Goal:** Determine if the GKM spill has created potentially unhealthy contaminant concentrations in airborne dust.

**Actions:** The Long-Term Impact Review Team will review the sediment data and make a decision on what monitoring, if any, is necessary for airborne dust.

## **10. Plants and Animals**

### **10.1 Aquatic and Riparian Habitat Assessment**

**Goal:** Determine if GKM spill contaminants have adversely affected, or are being accumulated by, aquatic and riparian algae, plants and animals.

**Actions:**

- Determine heavy metal concentrations from tissues of riparian and aquatic plants and algae, aquatic and terrestrial arthropods, and fishes.
- Evaluate two potential pathways of primary sources of contamination, riparian plants (groundwater into roots) and algae (through surface water and sediments) through use of naturally-occurring stable isotopes of carbon, or stable isotopes of nitrogen, as tracers for the source of food for higher levels in the food web, in rivers and streams.
- Analysis of metal concentrations and stable isotopes (carbon and nitrogen) ratios to characterize metals pathways.
- Document how metals move through the food web, from surrounding riparian areas and river sediments into the water column, to sources of food (algae, riparian plants) and consumers (aquatic and terrestrial arthropods, fishes).

### **10.2 Benthic Microbial Community and Functions**

**Goals:** Determine how toxics contamination from the Gold King Mine spill has affected microbial communities downstream of the site, including inhibition of microbial activities.

**Actions:**

- Monitor microbial communities in non-impacted and impacted sites.
- Assess inhibition of microbial nitrogen and carbon processing in laboratory experiments.

### **10.3 Nutrient Processing Studies**

**Goal:** Document the fate of nutrients along the Animas river, as well as the capacity of biotic communities to take up nutrients in response to the GKM spill.

**Actions:**

- Conduct microcosm experiments to understand microbial nutrient processing using native sediments collected from the Cement Creek – Animas River-San Juan River continuum. investigate how in-stream nutrient processing is being affected by the Gold King Mine spill both spatially and temporally, from headwaters to large rivers.
- Use the results of the microcosm studies to quantify the effects of the GKM spill on benthic and hyporheic microorganisms.

### **10.4 Fish and Other Wildlife**

**Goal:** Determine if Gold King Mine (GKM) spill contaminants have adversely affected, or are being accumulated by, fish and other wildlife.

**Actions:**

Monitor populations and health, and when effects are observed or expected, sample fish and other wildlife for heavy metals toxicity.

- Aquatic Wildlife (fish and macroinvertebrates)
- Terrestrial Wildlife (mule deer, elk, beaver or muskrat, and mice or rats)
- Amphibians and Reptiles (turtles, lizards and snakes)
- Birds (waterfowl)

## **11. Informational Conference**

**Goal:** Disseminate information and results from the monitoring and research efforts outlined in this LTMP. Bring together academics, agencies, representatives and community members and provide a forum for addressing concerns and questions over the GKM spill and the continuing monitoring efforts.

**Actions:** Coordinate an informational conference during the Summer of 2017, in Farmington, New Mexico. The Second Annual Conference on Environmental Conditions of the Animas and San Juan Watersheds with Emphasis on Gold King Mine and Other Mine Issues is scheduled for June 20-22, 2017, at San Juan College in Farmington, New Mexico.

<https://animas.nmwri.nmsu.edu/2017/>

This element is funded by an EPA Clean Water Act Section 106 grant through June 2017.

## **12. Community Outreach and Involvement**

**Goal:** Keep the public informed of the results from the monitoring and research efforts outlined in this Plan. Provide opportunities for public comment on the progress and direction of monitoring activities.

**Actions:** Distribute written informational material to the public, host periodic public meetings, create and support a Citizens' Advisory Committee to work with the technical Long-Term Impact Review Team to ensure that citizen and stakeholder concerns continue to be carried forward.

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# Appendix D

## County Assessors Information



# San Juan County Colorado Property and Maps

## San Juan County Colorado Property and Maps

Account #R1278  
COUNTY ROAD 2, SILVERTON, CO 81433

Total Value  
\$38,850

### OVERVIEW

#### KEY INFORMATION

Account #	R1278		Parcel #	47730190030005	
Name(s)	SUNNYSIDE GOLD CORP				
Mailing Address	5075 S SYRACUSE ST STE 800 DENVER CO 80237-2712				
Situs Address	COUNTY ROAD 2, SILVERTON, CO 81433				
Total Acres	17.70		Total Sq Ft	385,506	
Section	19	Township	42	Range	6
Tax District	101	Economic Area	-	Block	-
Plat Reference	-				
Legal Description	EUREKA TOWNSITE LOT 5 ACCORDING TO THE RECORDED BOUNDARY ADJUSTMENT THEREOF FILED FOR RECORD SEPTEMBER 30, 2011 AS RECEPTION #148168.				

#### VALUE INFORMATION

	Actual	Assessed
Land	\$38,850	\$11,267
Improvement	-	-
Total	\$38,850	\$11,267

### IMPROVEMENTS

No improvements to display.

### LAND DETAILS

DESCRIPTION	EFFECTIVE ACRES*	EFFECTIVE SQ FT*	VALUE
Natural Resources	8.85	385,506	\$38,850

\* Accounting for undivided interests and mixed use properties calculate smaller than the full property size.

### TRANSFER HISTORY

SALE DATE	AMT	RECEPTION	TYPE	GRANTEES	GRANTORS
09/30/2012	\$0	148168	Warranty Deed(WD)	SUNNYSIDE GOLD CORP	SAN JUAN COUNTY SUNNYSIDE GOLD CORP

### MINING CLAIMS

CLAIM NAME		MINERAL SURVEY #	
+	-	0	

Acres	9.18	Road	-
District	-	Patent	0.000000000000
Mapping Status	-		
Waste	yes	Waterfront	Animas



No Photo Available





# San Juan County Colorado Property and Maps

## San Juan County Colorado Property and Maps

Account #R1279  
COUNTY ROAD 2, SILVERTON, CO 81433

Total Value  
\$36,900

### OVERVIEW

#### KEY INFORMATION

Account #	R1279		Parcel #	47730190030006	
Name(s)	SUNNYSIDE GOLD CORP				
Mailing Address	5075 S SYRACUSE ST STE 800 DENVER CO 80237-2712				
Situs Address	COUNTY ROAD 2, SILVERTON, CO 81433				
Total Acres	13.80		Total Sq Ft	300,564	
Section	19	Township	42	Range	6
Tax District	101	Economic Area	-	Block	-
Plat Reference	-				
Legal Description	EUREKA TOWNSITE LOT 6 ACCORDING TO THE RECORDED BOUNDARY ADJUSTMENT THEREOF FILED FOR RECORD SEPTEMBER 30, 2011 AS RECEPTION #148168.				

#### VALUE INFORMATION

	Actual	Assessed
Land	\$36,900	\$10,701
Improvement	-	-
Total	\$36,900	\$10,701

### IMPROVEMENTS

No improvements to display.

### LAND DETAILS

DESCRIPTION	EFFECTIVE ACRES*	EFFECTIVE SQ FT*	VALUE
Natural Resources	6.90	300,564	\$36,900

\* Accounting for undivided interests and mixed use properties calculate smaller than the full property size.

### TRANSFER HISTORY

SALE DATE	AMT	RECEPTION	TYPE	GRANTEES	GRANTORS
No items to display					

### MINING CLAIMS

CLAIM NAME		MINERAL SURVEY #	
+	-	0	

Acres	7.17	Road	-
District	-	Patent	0.000000000000
Mapping Status	-		
Waste	yes	Waterfront	Animas



No Photo Available





# San Juan County Colorado Property and Maps

## San Juan County Colorado Property and Maps

Account #N1278  
SILVERTON, CO 81433

Total Value  
\$51,341

### OVERVIEW

#### KEY INFORMATION

Account #	N1278		Parcel #	47730190050004	
Name(s)	SUNNYSIDE GOLD CORP				
Mailing Address	5075 S SYRACUSE ST STE 800 DENVER CO 80237-2712				
Situs Address	SILVERTON, CO 81433				
Total Acres	51.34		Total Sq Ft	2,236,415	
Section	19	Township	42	Range	6
Tax District	101	Economic Area	-	Block	-
Plat Reference	-				
Legal Description	CASHIER LODE - 134 UND 9/10 INT IN 10.15 ACRES, CENTENNIAL - 16635, NASBY - 2508, ROVING RANGER LODE - 151 A, TAGNER - 16804, WHITE STAR - 14368				

#### VALUE INFORMATION

	Actual	Assessed
Land	\$51,341	\$14,889
Improvement	-	-
Total	\$51,341	\$14,889

### IMPROVEMENTS

No improvements to display.

### LAND DETAILS

DESCRIPTION	EFFECTIVE ACRES*	EFFECTIVE SQ FT*	VALUE
Natural Resources	6.65	289,674	\$6,650
Natural Resources	8.12	353,664	\$8,119
Natural Resources	8.18	356,147	\$8,176
Natural Resources	8.99	391,648	\$8,991
Natural Resources	9.14	397,921	\$9,135
Natural Resources	10.27	447,361	\$10,270

\* Accounting for undivided interests and mixed use properties calculate smaller than the full property size.

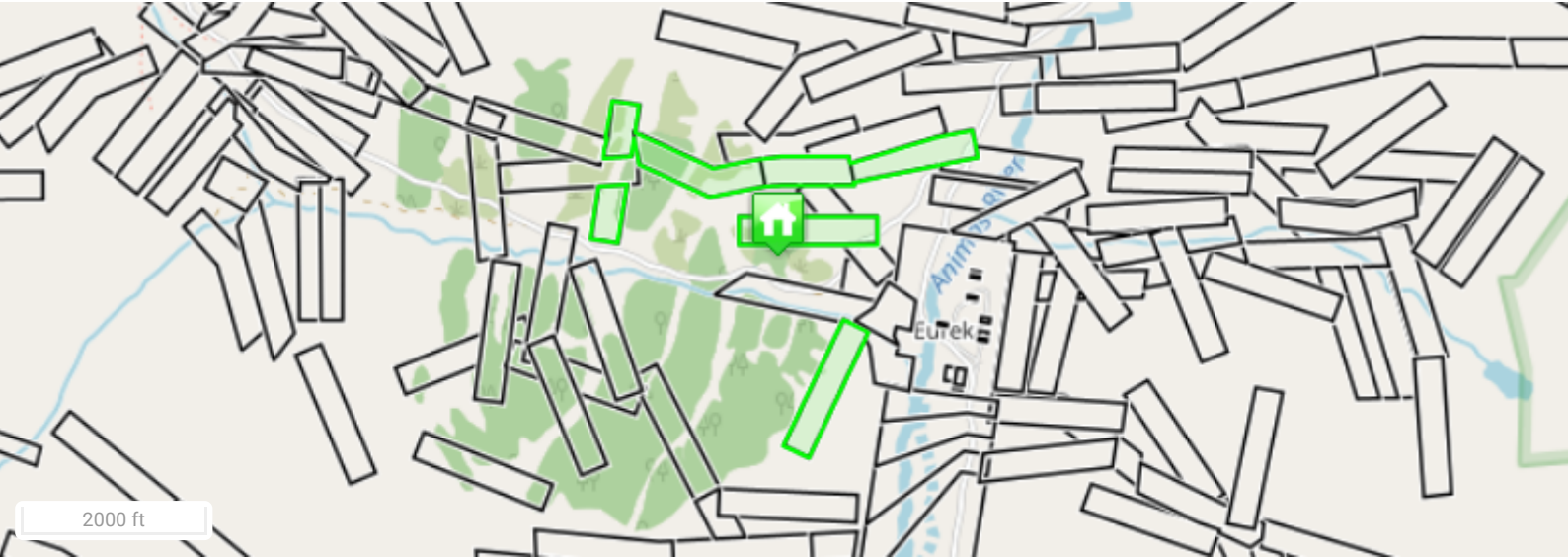
### TRANSFER HISTORY

SALE DATE	AMT	RECEPTION	TYPE	GRANTEES	GRANTORS
06/01/1991	\$0	B237 P432	Quit Claim Deed(QCD)	SAN JUAN COUNTY	WASHINGTON MINING

### MINING CLAIMS



CLAIM NAME		MINERAL SURVEY #	
+ CASHIER		134	
Acres	10.01	Road	-
District	EUREKA MINING DISTRICT	Patent	3186.00000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-
+ CENTENNIAL		16635	
Acres	8.36	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	39811.00000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-
+ NASBY		2508	
Acres	10.32	Road	-
District	EUREKA MINING DISTRICT	Patent	15009.00000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-
+ ROVING RANGER		151	
Acres	6.63	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	5480.00000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-
+ TAGNER		16804	
Acres	10.32	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	40898.00000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-
+ WHITE STAR		14368	
Acres	10.11	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	35562.00000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-



No Photo Available





# San Juan County Colorado Property and Maps

## San Juan County Colorado Property and Maps

Account #R1328  
COUNTY ROAD 2, SILVERTON, CO 81433

Total Value  
\$71,650

### OVERVIEW

#### KEY INFORMATION

Account #	R1328		Parcel #	47730300020001	
Name(s)	SUNNYSIDE GOLD CORP				
Mailing Address	5075 S SYRACUSE ST STE 800 DENVER CO 80237-2712				
Situs Address	COUNTY ROAD 2, SILVERTON, CO 81433				
Total Acres	41.65		Total Sq Ft	1,814,274	
Section	30	Township	42	Range	6
Tax District	101	Economic Area	-	Block	-
Plat Reference	-				
Legal Description	EUREKA TOWNSITE LOT 1 ACCORDING TO THE RECORDED BOUNDARY ADJUSTMENT THEREOF FILED FOR RECORD SEPTEMBER 30, 2011 AS RECEPTION #148168.				

#### VALUE INFORMATION

	Actual	Assessed
Land	\$71,650	\$20,779
Improvement	-	-
Total	\$71,650	\$20,779

### IMPROVEMENTS

No improvements to display.

### LAND DETAILS

DESCRIPTION	EFFECTIVE ACRES*	EFFECTIVE SQ FT*	VALUE
Natural Resources	41.65	1,814,274	\$71,650

\* Accounting for undivided interests and mixed use properties calculate smaller than the full property size.

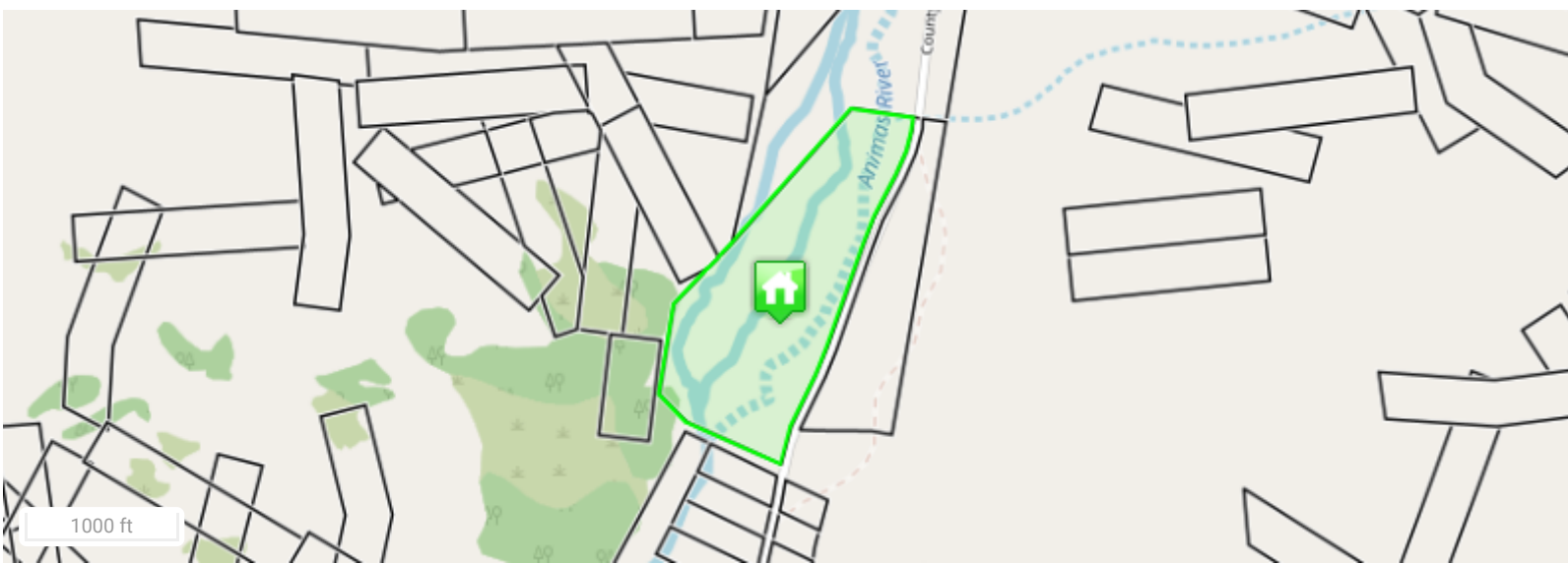
### TRANSFER HISTORY

SALE DATE	AMT	RECEPTION	TYPE	GRANTEES	GRANTORS
No items to display					

### MINING CLAIMS

CLAIM NAME		MINERAL SURVEY #	
+	-	0	

Acres	41.62	Road	-
District	-	Patent	0.000000000000
Mapping Status	-		
Waste	yes	Waterfront	Animas



No Photo Available





# San Juan County Colorado Property and Maps

## San Juan County Colorado Property and Maps

Account #R1329  
COUNTY ROAD 2, SILVERTON, CO 81433

Total Value  
\$86,120

### OVERVIEW

#### KEY INFORMATION

Account #	R1329		Parcel #	47730300020002	
Name(s)	SUNNYSIDE GOLD CORP				
Mailing Address	5075 S SYRACUSE ST STE 800 DENVER CO 80237-2712				
Situs Address	COUNTY ROAD 2, SILVERTON, CO 81433				
Total Acres	93.36		Total Sq Ft	1,355,587	
Section	30	Township	42	Range	6
Tax District	101	Economic Area	-	Block	-
Plat Reference	-				
Legal Description	EUREKA TOWNSITE LOT 2 ACCORDING TO THE RECORDED BOUNDARY ADJUSTMENT THEREOF FILED FOR RECORD SEPTEMBER 30, 2011 AS RECEPTION #148168.				

#### VALUE INFORMATION

	Actual	Assessed
Land	\$86,120	\$24,975
Improvement	-	-
Total	\$86,120	\$24,975

### IMPROVEMENTS

No improvements to display.

### LAND DETAILS

DESCRIPTION	EFFECTIVE ACRES*	EFFECTIVE SQ FT*	VALUE
Natural Resources	31.12	1,355,587	\$86,120

\* Accounting for undivided interests and mixed use properties calculate smaller than the full property size.

### TRANSFER HISTORY

SALE DATE	AMT	RECEPTION	TYPE	GRANTEES	GRANTORS
No items to display					

### MINING CLAIMS

CLAIM NAME		MINERAL SURVEY #	
+	-	0	

Acres	31.81	Road	-
District	-	Patent	0.000000000000
Mapping Status	-		
Waste	yes	Waterfront	Animas



No Photo Available







# San Juan County Colorado Property and Maps

## San Juan County Colorado Property and Maps

Account #R1330  
COUNTY ROAD 2, SILVERTON, CO 81433

Total Value  
\$66,920

### OVERVIEW

#### KEY INFORMATION

Account #	R1330		Parcel #	47730300020003	
Name(s)	SUNNYSIDE GOLD CORP				
Mailing Address	5075 S SYRACUSE ST STE 800 DENVER CO 80237-2712				
Situs Address	COUNTY ROAD 2, SILVERTON, CO 81433				
Total Acres	23.84		Total Sq Ft	519,235	
Section	30	Township	42	Range	6
Tax District	101	Economic Area	-	Block	-
Plat Reference	-				
Legal Description	EUREKA TOWNSITE LOT 3 ACCORDING TO THE RECORDED BOUNDARY ADJUSTMENT THEREOF FILED FOR RECORD SEPTEMBER 30, 2011 AS RECEPTION #148168.				

#### VALUE INFORMATION

	Actual	Assessed
Land	\$66,920	\$19,407
Improvement	-	-
Total	\$66,920	\$19,407

### IMPROVEMENTS

No improvements to display.

### LAND DETAILS

DESCRIPTION	EFFECTIVE ACRES*	EFFECTIVE SQ FT*	VALUE
Natural Resources	11.92	519,235	\$66,920

\* Accounting for undivided interests and mixed use properties calculate smaller than the full property size.

### TRANSFER HISTORY

SALE DATE	AMT	RECEPTION	TYPE	GRANTEES	GRANTORS
No items to display					

### MINING CLAIMS

CLAIM NAME		MINERAL SURVEY #	
+	-	0	

Acres	12.23	Road	-
District	-	Patent	0.000000000000
Mapping Status	-		
Waste	yes	Waterfront	Animas



No Photo Available





# San Juan County Colorado Property and Maps

## San Juan County Colorado Property and Maps

Account #R1331  
COUNTY ROAD 2, SILVERTON, CO 81433

Total Value  
\$64,660

### OVERVIEW

#### KEY INFORMATION

Account #	R1331		Parcel #	47730300020004	
Name(s)	SUNNYSIDE GOLD CORP				
Mailing Address	5075 S SYRACUSE ST STE 800 DENVER CO 80237-2712				
Situs Address	COUNTY ROAD 2, SILVERTON, CO 81433				
Total Acres	19.32		Total Sq Ft	420,790	
Section	19	Township	42	Range	6
Tax District	101	Economic Area	-	Block	-
Plat Reference	-				
Legal Description	EUREKA TOWNSITE LOT 4 ACCORDING TO THE RECORDED BOUNDARY ADJUSTMENT THEREOF FILED FOR RECORD SEPTEMBER 30, 2011 AS RECEPTION #148168.				

#### VALUE INFORMATION

	Actual	Assessed
Land	\$64,660	\$18,751
Improvement	-	-
Total	\$64,660	\$18,751

### IMPROVEMENTS

No improvements to display.

### LAND DETAILS

DESCRIPTION	EFFECTIVE ACRES*	EFFECTIVE SQ FT*	VALUE
Natural Resources	9.66	420,790	\$64,660

\* Accounting for undivided interests and mixed use properties calculate smaller than the full property size.

### TRANSFER HISTORY

SALE DATE	AMT	RECEPTION	TYPE	GRANTEES	GRANTORS
No items to display					

### MINING CLAIMS

CLAIM NAME		MINERAL SURVEY #	
+	-	0	

Acres	9.91	Road	-
District	-	Patent	0.000000000000
Mapping Status	-		
Waste	yes	Waterfront	Animas



No Photo Available





# San Juan County Colorado Property and Maps

## San Juan County Colorado Property and Maps

Account #N1440  
SILVERTON, CO 81433

Total Value  
\$22,373

### OVERVIEW

#### KEY INFORMATION

Account #	N1440		Parcel #	47750090050001	
Name(s)	SUNNYSIDE GOLD CORP				
Mailing Address	5075 S SYRACUSE ST STE 800 DENVER CO 80237-2712				
Situs Address	SILVERTON, CO 81433				
Total Acres	25.28		Total Sq Ft	1,101,197	
Section	9	Township	42	Range	7
Tax District	101	Economic Area	-	Block	-
Plat Reference	-				
Legal Description	CASHIER - 442, ORIENTAL - 566, PRIDE OF THE ALPS - 572				

#### VALUE INFORMATION

	Actual	Assessed
Land	\$22,373	\$6,488
Improvement	-	-
Total	\$22,373	\$6,488

### IMPROVEMENTS

No improvements to display.

### LAND DETAILS

DESCRIPTION	EFFECTIVE ACRES*	EFFECTIVE SQ FT*	VALUE
Natural Resources	4.65	202,554	\$4,115
Natural Resources	10.30	448,668	\$9,116
Natural Resources	10.33	449,975	\$9,142

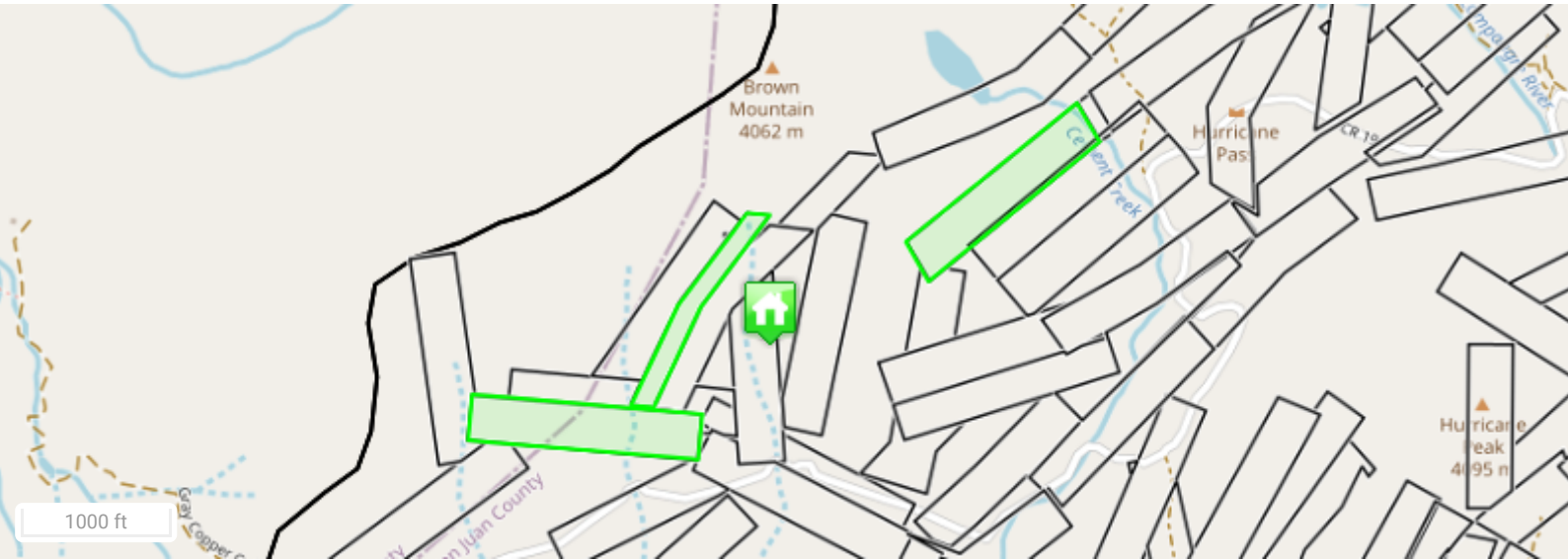
\* Accounting for undivided interests and mixed use properties calculate smaller than the full property size.

### TRANSFER HISTORY

SALE DATE	AMT	RECEPTION	TYPE	GRANTEES	GRANTORS
No items to display					

### MINING CLAIMS

CLAIM NAME		MINERAL SURVEY #	
+ CASHIER		442	
Acres	9.49	Road	10-B
District	EUREKA MINING DISTRICT	Patent	6715.00000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-
+ ORIENTAL		566	
Acres	4.70	Road	Hurricane Pass
District	EUREKA MINING DISTRICT	Patent	7683.00000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-
+ PRIDE OF THE ALPS		572	
Acres	10.58	Road	Hurricane Pass
District	EUREKA MINING DISTRICT	Patent	9383.00000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-



No Photo Available









# San Juan County Colorado Property and Maps

## San Juan County Colorado Property and Maps

Account #N1476  
SILVERTON, CO 81433

Total Value  
\$37,606

### OVERVIEW

#### KEY INFORMATION

Account #	N1476		Parcel #	47750100050003	
Name(s)	SUNNYSIDE GOLD CORP				
Mailing Address	5075 S SYRACUSE ST STE 800 DENVER CO 80237-2712				
Situs Address	SILVERTON, CO 81433				
Total Acres	42.49		Total Sq Ft	1,850,952	
Section	10	Township	42	Range	7
Tax District	101	Economic Area	-	Block	-
Plat Reference	-				
Legal Description	EMMA - 2273, LULU CARROLL - 837, MOTHER GOOSE - 17234, MOULTRIE LODE - 173, PAYMASTER - 1301, PONY - 2336 UND 2/3 INT IN 8.10 ACRES				

#### VALUE INFORMATION

	Actual	Assessed
Land	\$37,606	\$10,905
Improvement	-	-
Total	\$37,606	\$10,905

### IMPROVEMENTS

No improvements to display.

### LAND DETAILS

DESCRIPTION	EFFECTIVE ACRES*	EFFECTIVE SQ FT*	VALUE
Natural Resources	3.95	172,062	\$3,496
Natural Resources	5.40	235,224	\$4,779
Natural Resources	6.35	276,693	\$5,622
Natural Resources	6.50	283,140	\$5,752
Natural Resources	10.03	436,907	\$8,877
Natural Resources	10.26	446,926	\$9,080

\* Accounting for undivided interests and mixed use properties calculate smaller than the full property size.

### TRANSFER HISTORY

SALE DATE	AMT	RECEPTION	TYPE	GRANTEES	GRANTORS
No items to display					

### MINING CLAIMS

CLAIM NAME		MINERAL SURVEY #	
+ EMMA		2273	
Acres	4.39	Road	10A
District	EUREKA MINING DISTRICT	Patent	17562.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-
+ LULU CARROLL		837	
Acres	9.79	Road	10A
District	EUREKA MINING DISTRICT	Patent	7806.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-
+ MOTHER GOOSE		17234	
Acres	6.05	Road	-
District	EUREKA MINING DISTRICT	Patent	42919.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-
+ MOULTRIE		173	
Acres	10.25	Road	10A
District	EUREKA MINING DISTRICT	Patent	4685.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-
+ PAYMASTER		1301	
Acres	6.63	Road	Hurricane Pass
District	EUREKA MINING DISTRICT	Patent	9489.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-
+ PONY		2336	
Acres	8.06	Road	10A
District	EUREKA MINING DISTRICT	Patent	24758.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-



No Photo Available





# San Juan County Colorado Property and Maps

## San Juan County Colorado Property and Maps

Account #N1487  
SILVERTON, CO 81433

Total Value  
\$7,080

### OVERVIEW

#### KEY INFORMATION

Account #	N1487		Parcel #	47750100050031	
Name(s)	SUNNYSIDE GOLD CORP				
Mailing Address	5075 S SYRACUSE ST STE 800 DENVER CO 80237-2712				
Situs Address	SILVERTON, CO 81433				
Total Acres	8.00		Total Sq Ft	348,480	
Section	10	Township	42	Range	7
Tax District	101	Economic Area	-	Block	-
Plat Reference	-				
Legal Description	MIDNIGHT - 5616				

#### VALUE INFORMATION

	Actual	Assessed
Land	\$7,080	\$2,053
Improvement	-	-
Total	\$7,080	\$2,053

### IMPROVEMENTS

No improvements to display.

### LAND DETAILS

DESCRIPTION	EFFECTIVE ACRES*	EFFECTIVE SQ FT*	VALUE
Natural Resources	8.00	348,480	\$7,080

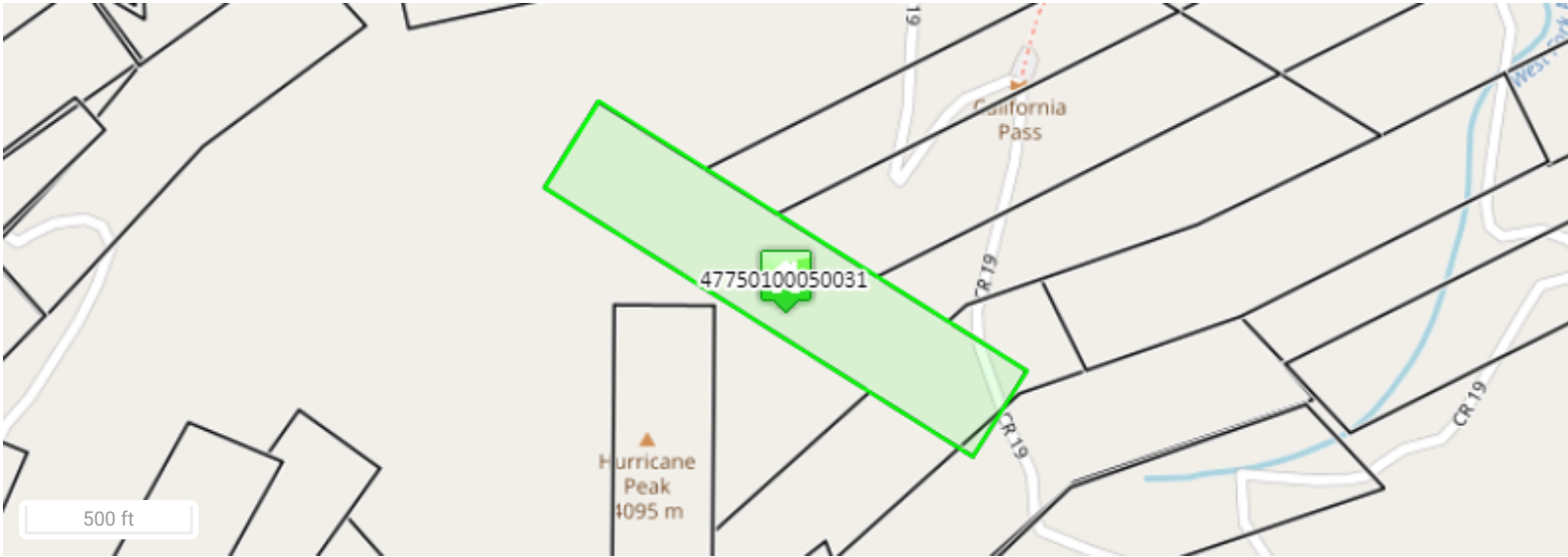
\* Accounting for undivided interests and mixed use properties calculate smaller than the full property size.

### TRANSFER HISTORY

SALE DATE	AMT	RECEPTION	TYPE	GRANTEES	GRANTORS
04/01/1992	\$0	B240 P152	Agrmnt to Termin. & Transfer(TA)	SUNNYSIDE GOLD	WASHINGTON MINING

### MINING CLAIMS

CLAIM NAME		MINERAL SURVEY #	
+ MIDNIGHT		5616	
Acres	10.33	Road	10
District	EUREKA MINING DISTRICT	Patent	19975.0000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-



No Photo Available







# San Juan County Colorado Property and Maps

## San Juan County Colorado Property and Maps

Account #N1488  
SILVERTON, CO 81433

Total Value  
\$2,129

### OVERVIEW

#### KEY INFORMATION

Account #	N1488		Parcel #	47750100050051	
Name(s)	SUNNYSIDE GOLD CORP				
Mailing Address	5075 S SYRACUSE ST STE 800 DENVER CO 80237-2712				
Situs Address	SILVERTON, CO 81433				
Total Acres	2.41		Total Sq Ft	104,834	
Section	10	Township	42	Range	7
Tax District	101	Economic Area	-	Block	-
Plat Reference	-				
Legal Description	TAGGART - 2338 UND 1/3 INT IN 7.22 ACRES				

#### VALUE INFORMATION

	Actual	Assessed
Land	\$2,129	\$617
Improvement	-	-
Total	\$2,129	\$617

### IMPROVEMENTS

No improvements to display.

### LAND DETAILS

DESCRIPTION	EFFECTIVE ACRES*	EFFECTIVE SQ FT*	VALUE
Natural Resources	2.41	104,834	\$2,129

\* Accounting for undivided interests and mixed use properties calculate smaller than the full property size.

### TRANSFER HISTORY

SALE DATE	AMT	RECEPTION	TYPE	GRANTEES	GRANTORS
No items to display					

### MINING CLAIMS

CLAIM NAME		MINERAL SURVEY #	
+ TAGGART		2338	
Acres	7.15	Road	10
District	EUREKA MINING DISTRICT	Patent	24214.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-



No Photo Available





# San Juan County Colorado Property and Maps

## San Juan County Colorado Property and Maps

Account #N1495  
SILVERTON, CO 81433

Total Value  
\$78,918

### OVERVIEW

#### KEY INFORMATION

Account #	N1495		Parcel #	47750110050002	
Name(s)	SUNNYSIDE GOLD CORP				
Mailing Address	5075 S SYRACUSE ST STE 800 DENVER CO 80237-2712				
Situs Address	SILVERTON, CO 81433				
Total Acres	89.17		Total Sq Ft	3,884,377	
Section	11	Township	42	Range	7
Tax District	101	Economic Area	-	Block	-
Plat Reference	-				
Legal Description	PALOS - 18732, PALOS #1 - 18732, PALOS #2 - 18732, SUNNYSIDE #2 - 20003, SUNNYSIDE EXT - 1180, TERRY - 17986, MASTODON - 216, NO NAME - 2272, CROWN JEWEL - 20003, DOCTOR - 2093 A, ESMARALDA - 16165, GOLD PRINCE - 20003				

#### VALUE INFORMATION

	Actual	Assessed
Land	\$78,918	\$22,886
Improvement	-	-
Total	\$78,918	\$22,886

### IMPROVEMENTS

No improvements to display.

### LAND DETAILS

DESCRIPTION	EFFECTIVE ACRES*	EFFECTIVE SQ FT*	VALUE
Natural Resources	2.09	90,997	\$1,849
Natural Resources	5.02	218,584	\$4,441
Natural Resources	5.74	250,034	\$5,080
Natural Resources	5.81	253,127	\$5,143
Natural Resources	6.32	275,256	\$5,592
Natural Resources	7.27	316,681	\$6,434
Natural Resources	7.66	333,670	\$6,779
Natural Resources	8.29	361,200	\$7,338
Natural Resources	10.00	435,600	\$8,850
Natural Resources	10.32	449,409	\$9,131
Natural Resources	10.33	449,844	\$9,139
Natural Resources	10.33	449,975	\$9,142

\* Accounting for undivided interests and mixed use properties calculate smaller than the full property size.

### TRANSFER HISTORY

SALE DATE	AMT	RECEPTION	TYPE	GRANTEES	GRANTORS
No items to display					

### MINING CLAIMS

CLAIM NAME		MINERAL SURVEY #	
+ CROWN JEWEL		20003	
Acres	5.88	Road	Placer Gulch
District	EUREKA MINING DISTRICT	Patent	1065628.00000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-
+ DOCTOR		18826	
Acres	10.32	Road	Maggie Gulch
District	EUREKA MINING DISTRICT	Patent	131380.000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-
+ ESMERALDA		16165	
Acres	10.24	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	38633.0000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-
+ GOLD PRINCE		20003	
Acres	1.85	Road	-
District	EUREKA MINING DISTRICT	Patent	1065628.00000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-
+ MASTODON		216	
Acres	10.27	Road	-
District	EUREKA MINING DISTRICT	Patent	5459.00000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-
+ NO NAME		2272	
Acres	7.86	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	22694.0000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-
+ PALOS		18732	
Acres	10.33	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	144740.000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-
+ PALOS #1		18732	

CLAIM NAME		MINERAL SURVEY #	
Acres	10.30	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	144740.000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-

+ PALOS #2		18732	
Acres	6.85	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	144740.000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-

+ SUNNYSIDE #2		20003	
Acres	8.33	Road	-
District	EUREKA MINING DISTRICT	Patent	1065628.00000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-

+ SUNNYSIDE EXTENTION		1180	
Acres	5.77	Road	-
District	EUREKA MINING DISTRICT	Patent	15459.0000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-

+ TERRY LODE		17986	
Acres	5.03	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	45383.0000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-



No Photo Available







# San Juan County Colorado Property and Maps

## San Juan County Colorado Property and Maps

Account #N1508  
SILVERTON, CO 81433

Total Value  
\$8,620

### OVERVIEW

#### KEY INFORMATION

Account #	N1508		Parcel #	47750110050022	
Name(s)	SUNNYSIDE GOLD CORP				
Mailing Address	5075 S SYRACUSE ST STE 800 DENVER CO 80237-2712				
Situs Address	SILVERTON, CO 81433				
Total Acres	9.74		Total Sq Ft	424,274	
Section	11	Township	42	Range	7
Tax District	101	Economic Area	-	Block	-
Plat Reference	-				
Legal Description	FEARLESS - 17011				

#### VALUE INFORMATION

	Actual	Assessed
Land	\$8,620	\$2,500
Improvement	-	-
Total	\$8,620	\$2,500

### IMPROVEMENTS

No improvements to display.

### LAND DETAILS

DESCRIPTION	EFFECTIVE ACRES*	EFFECTIVE SQ FT*	VALUE
Natural Resources	9.74	424,274	\$8,620

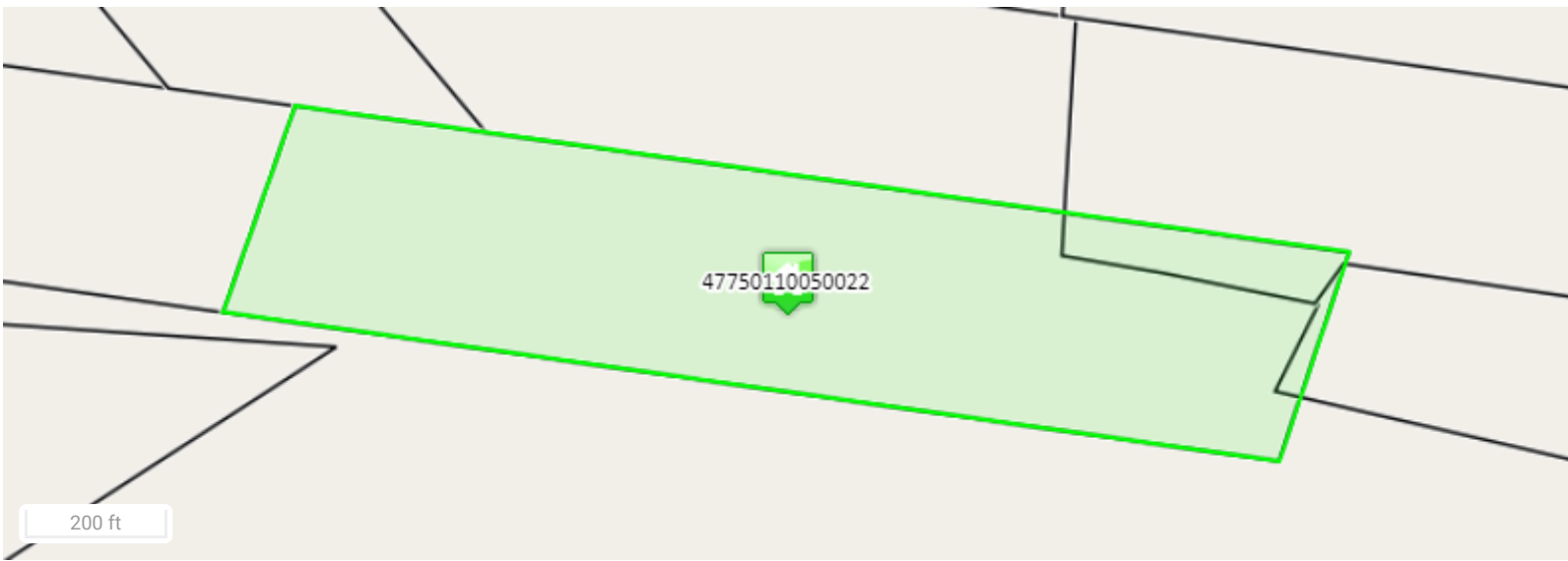
\* Accounting for undivided interests and mixed use properties calculate smaller than the full property size.

### TRANSFER HISTORY

SALE DATE	AMT	RECEPTION	TYPE	GRANTEES	GRANTORS
No items to display					

### MINING CLAIMS

CLAIM NAME		MINERAL SURVEY #	
+ FEARLESS		17011	
Acres	9.72	Road	Placer Gulch
District	EUREKA MINING DISTRICT	Patent	42070.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-



No Photo Available





# San Juan County Colorado Property and Maps

## San Juan County Colorado Property and Maps

Account #N1550  
SILVERTON, CO 81433

Total Value  
\$43,923

### OVERVIEW

#### KEY INFORMATION

Account #	N1550		Parcel #	47750130050001	
Name(s)	SUNNYSIDE GOLD CORP				
Mailing Address	5075 S SYRACUSE ST STE 800 DENVER CO 80237-2712				
Situs Address	SILVERTON, CO 81433				
Total Acres	43.92		Total Sq Ft	1,913,300	
Section	14	Township	42	Range	7
Tax District	101	Economic Area	-	Block	-
Plat Reference	-				
Legal Description	MUSKEGON - 1394, RARUS - 1401, NANTUCKET - 6954 UND 5/12 INT IN 10.28 ACRES, DENVER - 1403, ALMA - 1708, CHARLTON - 1706				

#### VALUE INFORMATION

	Actual	Assessed
Land	\$43,923	\$12,739
Improvement	-	-
Total	\$43,923	\$12,739

### IMPROVEMENTS

No improvements to display.

### LAND DETAILS

DESCRIPTION	EFFECTIVE ACRES*	EFFECTIVE SQ FT*	VALUE
Natural Resources	4.24	184,694	\$4,240
Natural Resources	4.28	186,582	\$4,283
Natural Resources	6.49	282,704	\$6,490
Natural Resources	8.25	359,370	\$8,250
Natural Resources	10.33	449,975	\$10,330

\* Accounting for undivided interests and mixed use properties calculate smaller than the full property size.

### TRANSFER HISTORY

SALE DATE	AMT	RECEPTION	TYPE	GRANTEES	GRANTORS
No items to display					

### MINING CLAIMS

CLAIM NAME		MINERAL SURVEY #	
+ ALMA		1708	
Acres	6.29	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	11227.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-
+ CHARLTON		1706	
Acres	4.22	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	16571.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-
+ DENVER		1403	
Acres	8.27	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	9314.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-
+ MUSKEGON		1394	
Acres	9.83	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	9389.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-
+ NANTUCKET		6954	
Acres	10.04	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	21407.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-
+ RARUS		1401	
Acres	10.33	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	9312.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-



No Photo Available





# San Juan County Colorado Property and Maps

## San Juan County Colorado Property and Maps

Account #N1552  
SILVERTON, CO 81433

Total Value  
\$26,105

### OVERVIEW

#### KEY INFORMATION

Account #	N1552		Parcel #	47750130050003	
Name(s)	SUNNYSIDE GOLD CORP				
Mailing Address	5075 S SYRACUSE ST STE 800 DENVER CO 80237-2712				
Situs Address	SILVERTON, CO 81433				
Total Acres	26.11		Total Sq Ft	1,137,134	
Section	13	Township	42	Range	7
Tax District	101	Economic Area	-	Block	-
Plat Reference	-				
Legal Description	CLIMAX #3 - 19474, TIP TOP - 18108, TIP TIP #2 - 19474, TIP TOP #3 - 19474				

#### VALUE INFORMATION

	Actual	Assessed
Land	\$26,105	\$7,570
Improvement	-	-
Total	\$26,105	\$7,570

### IMPROVEMENTS

No improvements to display.

### LAND DETAILS

DESCRIPTION	EFFECTIVE ACRES*	EFFECTIVE SQ FT*	VALUE
Natural Resources	3.32	144,663	\$3,321
Natural Resources	5.20	226,686	\$5,204
Natural Resources	7.60	331,056	\$7,600
Natural Resources	9.98	434,729	\$9,980

\* Accounting for undivided interests and mixed use properties calculate smaller than the full property size.

### TRANSFER HISTORY

SALE DATE	AMT	RECEPTION	TYPE	GRANTEES	GRANTORS
04/21/1986	\$4,770	B231 P291	Warranty Deed(WD)	SUNNYSIDE GOLD CORP	ADOBE RESOURCES ADOBE RESOURCES CORP

### MINING CLAIMS

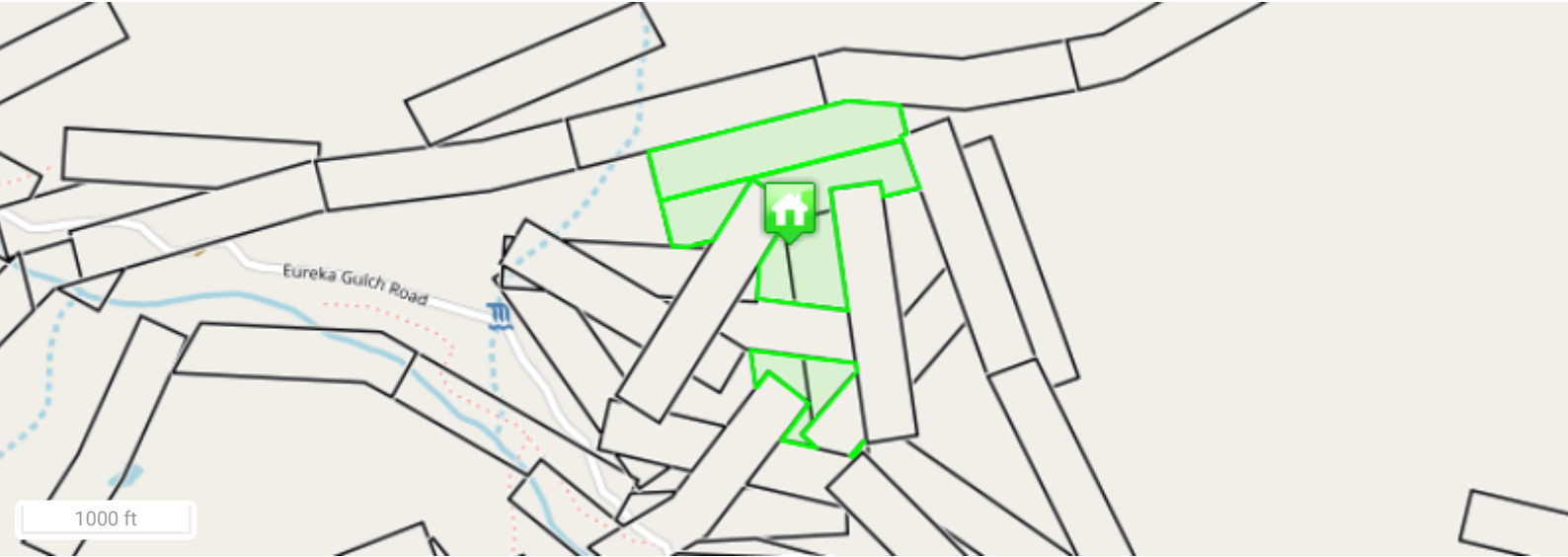


CLAIM NAME		MINERAL SURVEY #	
+ CLIMAX #3		19474	
Acres	7.58	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	433078.000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-

+ TIP TOP		18108	
Acres	10.13	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	46453.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-

+ TIP TOP #2		19474	
Acres	5.23	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	433078.000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-

+ TIP TOP #3		19474	
Acres	3.29	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	433078.000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-



No Photo Available





# San Juan County Colorado Property and Maps

## San Juan County Colorado Property and Maps

Account #N1562  
SILVERTON, CO 81433

Total Value  
\$177,225

### OVERVIEW

#### KEY INFORMATION

Account #	N1562		Parcel #	47750140050002	
Name(s)	SUNNYSIDE GOLD CORP				
Mailing Address	5075 S SYRACUSE ST STE 800 DENVER CO 80237-2712				
Situs Address	SILVERTON, CO 81433				
Total Acres	194.92		Total Sq Ft	8,490,757	
Section	7	Township	41	Range	7
Tax District	101	Economic Area	-	Block	-
Plat Reference	-				
Legal Description	REPUBLIC - 12724, RUBY - 18020, SHOSHONE - 17201, SILVER BOW - 18020, SUNNYSIDE - 438, SUNNYSIDE ANNEX - 16668, THUNDERBERG - 1395, WEDGE - 18160, ANACONDA - 18020, BAVARIAN - 1396, BRIGGS - 8400, BUTTE CITY - 18020, CLIMAX - 12723, CLIPPER - 1689, HERMAN - 1397, HIDDEN TREASURE EXT - 20003, LAKE - 2027, LAST CHANCE - 17901, LITTLE MARY - 2038, METROPOLIS - 1398, PEARL - 5975, QUAIL - 20003, RAYMOND - 18020				

#### VALUE INFORMATION

	Actual	Assessed
Land	\$177,225	\$51,398
Improvement	-	-
Total	\$177,225	\$51,398

### IMPROVEMENTS

No improvements to display.

### LAND DETAILS

DESCRIPTION	EFFECTIVE ACRES*	EFFECTIVE SQ FT*	VALUE
Natural Resources	0.78	33,890	\$607
Natural Resources	1.98	86,205	\$1,544
Natural Resources	5.70	248,292	\$5,700
Natural Resources	7.69	335,020	\$7,691
Natural Resources	7.89	343,688	\$7,890
Natural Resources	8.05	350,832	\$8,054
Natural Resources	8.11	353,272	\$6,326
Natural Resources	8.27	360,023	\$8,265
Natural Resources	8.92	388,642	\$6,959
Natural Resources	8.99	391,735	\$7,015
Natural Resources	9.02	392,911	\$9,020
Natural Resources	9.07	395,089	\$9,070
Natural Resources	9.64	419,918	\$9,640
Natural Resources	9.91	431,549	\$9,907
Natural Resources	10.33	449,757	\$10,325
Natural Resources	10.33	449,975	\$8,057
Natural Resources	10.33	450,018	\$10,331

\* Accounting for undivided interests and mixed use properties calculate smaller than the full property size.

### TRANSFER HISTORY

SALE DATE	AMT	RECEPTION	TYPE	GRANTEES	GRANTORS
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No items to display

MINING CLAIMS

CLAIM NAME		MINERAL SURVEY #	
+ ANACONDA		18020	
Acres	9.94	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	46982.0000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-
+ BAVARIAN		1396	
Acres	10.33	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	9390.00000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-
+ BRIGGS		8400	
Acres	8.47	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	24760.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-
+ BUTTE CITY		18020	
Acres	10.34	Road	-
District	EUREKA MINING DISTRICT	Patent	46982.0000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-
+ CLIMAX		18460	
Acres	7.81	Road	SHRINE RD / SCENIC RD
District	EUREKA MINING DISTRICT	Patent	47318.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-
+ CLIPPER		1689	
Acres	10.32	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	14301.0000000
Mapping Status	Updated using BLM data		
Waste	yes	Waterfront	-
+ HERMAN		1397	
Acres	8.54	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	10408.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-
+ HIDDEN TREASURE EXT		20003	

CLAIM NAME		MINERAL SURVEY #	
Acres	8.02	Road	Picayune Gulch
District	EUREKA MINING DISTRICT	Patent	1065628.00000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-

+ LAKE		2027	
Acres	8.20	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	15687.0000000
Mapping Status	Updated using BLM data		
Waste	Remediated	Waterfront	-

+ LAST CHANCE		17901	
Acres	2.25	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	110023.000000
Mapping Status	_Mapping not checked yet		
Waste	Remediated	Waterfront	-

+ LITTLE MARY		2038	
Acres	10.24	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	15010.0000000
Mapping Status	Updated using BLM data		
Waste	Remediated	Waterfront	-

+ METROPOLIS		1398	
Acres	5.67	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	10423.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-

+ PEARL		5975	
Acres	9.66	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	19976.0000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-

+ QUAIL		20003	
Acres	7.90	Road	-
District	EUREKA MINING DISTRICT	Patent	1065628.00000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-

+ RAYMOND		18020	
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CLAIM NAME		MINERAL SURVEY #	
Acres	8.21	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	46982.0000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-

+ REPUBLIC		12724	
Acres	9.22	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	31197.0000000
Mapping Status	Updated using BLM data		
Waste	Remediated	Waterfront	-

+ RUBY		18020	
Acres	8.22	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	46982.0000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-

+ SILVER BOW		18020	
Acres	10.31	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	46982.0000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-

+ SUNNYSIDE		438	
Acres	10.36	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	5899.00000000
Mapping Status	Updated using BLM data		
Waste	Remediated	Waterfront	-

+ SUNNYSIDE ANNEX		16668	
Acres	8.99	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	40377.0000000
Mapping Status	Updated using BLM data		
Waste	Remediated	Waterfront	-

+ THUNDERBERG		1395	
Acres	10.30	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	9388.00000000
Mapping Status	_Mapping not checked yet		
Waste	Remediated	Waterfront	-

+ WEDGE		18160	
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CLAIM NAME		MINERAL SURVEY #	
Acres	0.75	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	79639.0000000
Mapping Status	Updated using BLM data		
Waste	Remediated	Waterfront	-



No Photo Available





# San Juan County Colorado Property and Maps

## San Juan County Colorado Property and Maps

Account #N1573  
SILVERTON, CO 81433

Total Value  
\$33,564

### OVERVIEW

#### KEY INFORMATION

Account #	N1573		Parcel #	47750150050001	
Name(s)	SUNNYSIDE GOLD CORP				
Mailing Address	5075 S SYRACUSE ST STE 800 DENVER CO 80237-2712				
Situs Address	SILVERTON, CO 81433				
Total Acres	35.66		Total Sq Ft	1,553,262	
Section	15	Township	42	Range	7
Tax District	101	Economic Area	-	Block	-
Plat Reference	-				
Legal Description	GEORGE WASHINGTON - 2028, GRAND VIEW - 17202, MOUNTAIN SHEEP - 17432, OREGON - 17233				

#### VALUE INFORMATION

	Actual	Assessed
Land	\$33,564	\$9,733
Improvement	-	-
Total	\$33,564	\$9,733

### IMPROVEMENTS

No improvements to display.

### LAND DETAILS

DESCRIPTION	EFFECTIVE ACRES*	EFFECTIVE SQ FT*	VALUE
Natural Resources	7.37	320,863	\$7,366
Natural Resources	8.54	371,828	\$8,536
Natural Resources	9.52	414,517	\$7,422
Natural Resources	10.24	446,054	\$10,240

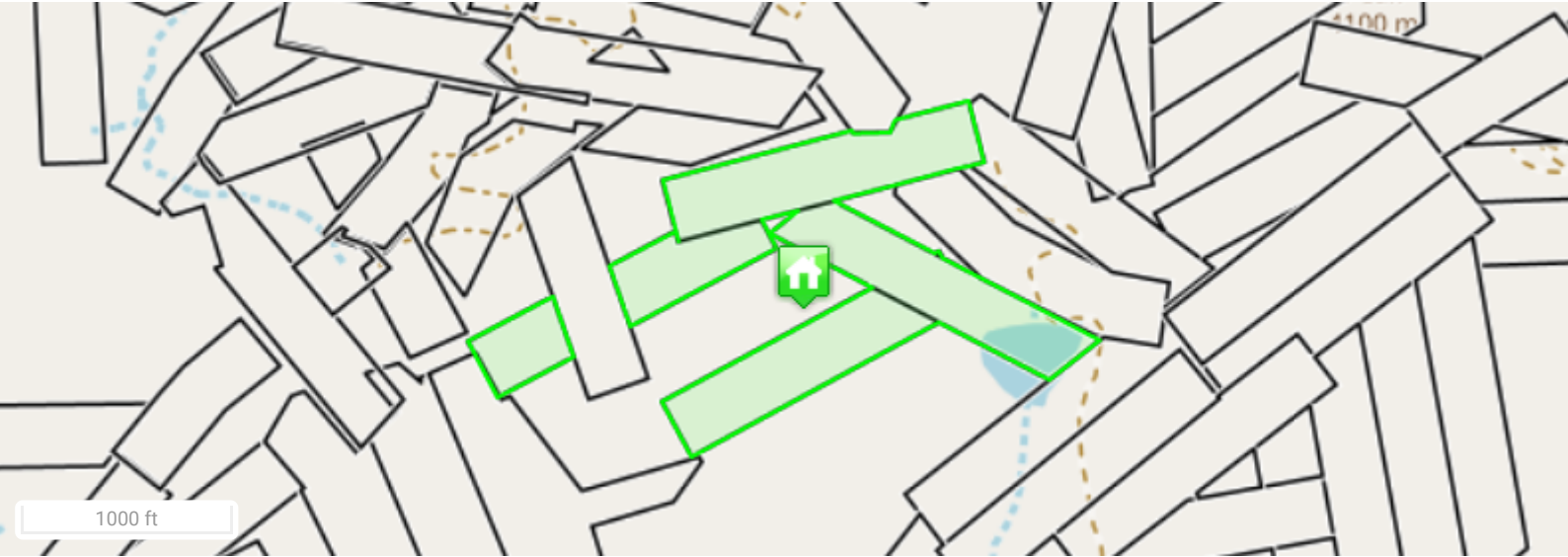
\* Accounting for undivided interests and mixed use properties calculate smaller than the full property size.

### TRANSFER HISTORY

SALE DATE	AMT	RECEPTION	TYPE	GRANTEES	GRANTORS
No items to display					

### MINING CLAIMS

CLAIM NAME		MINERAL SURVEY #	
+ GEORGE WASHINGTON		2028	
Acres	10.21	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	11523.0000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-
+ GRAND VIEW		17202	
Acres	7.68	Road	-
District	EUREKA MINING DISTRICT	Patent	42914.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-
+ MOUNTAIN SHEEP		17432	
Acres	8.31	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	45096.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-
+ OREGON		17233	
Acres	8.59	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	42968.0000000
Mapping Status	Updated using BLM data		
Waste	Remediated	Waterfront	-



No Photo Available





# San Juan County Colorado Property and Maps

## San Juan County Colorado Property and Maps

Account #N1574  
SILVERTON, CO 81433

Total Value  
\$17,431

### OVERVIEW

#### KEY INFORMATION

Account #	N1574		Parcel #	47750150050002	
Name(s)	SUNNYSIDE GOLD CORP				
Mailing Address	5075 S SYRACUSE ST STE 800 DENVER CO 80237-2712				
Situs Address	SILVERTON, CO 81433				
Total Acres	17.43		Total Sq Ft	759,294	
Section	15	Township	42	Range	7
Tax District	101	Economic Area	-	Block	-
Plat Reference	-				
Legal Description	HONECK - 16200, SILVER KING - 1857				

#### VALUE INFORMATION

	Actual	Assessed
Land	\$17,431	\$5,055
Improvement	-	-
Total	\$17,431	\$5,055

### IMPROVEMENTS

No improvements to display.

### LAND DETAILS

DESCRIPTION	EFFECTIVE ACRES*	EFFECTIVE SQ FT*	VALUE
Natural Resources	7.10	309,276	\$7,100
Natural Resources	10.33	450,018	\$10,331

\* Accounting for undivided interests and mixed use properties calculate smaller than the full property size.

### TRANSFER HISTORY

SALE DATE	AMT	RECEPTION	TYPE	GRANTEES	GRANTORS
11/25/1987	\$5,000	B231 P650	Warranty Deed(WD)	SUNNYSIDE GOLD CORP	DWYER I B

### MINING CLAIMS



CLAIM NAME		MINERAL SURVEY #	
+ HONECK		16200	
Acres	10.00	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	39189.0000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-

+ SILVER KING		1857	
Acres	8.90	Road	-
District	EUREKA MINING DISTRICT	Patent	17098.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-



No Photo Available





# San Juan County Colorado Property and Maps

## San Juan County Colorado Property and Maps

Account #N1581  
SILVERTON, CO 81433

Total Value  
\$18,900

### OVERVIEW

#### KEY INFORMATION

Account #	N1581		Parcel #	47750150050011	
Name(s)	SUNNYSIDE GOLD CORP				
Mailing Address	5075 S SYRACUSE ST STE 800 DENVER CO 80237-2712				
Situs Address	SILVERTON, CO 81433				
Total Acres	18.90		Total Sq Ft	823,284	
Section	15	Township	42	Range	7
Tax District	101	Economic Area	-	Block	-
Plat Reference	-				
Legal Description	PAYMASTER - 18080, WATERLOO - 17429				

#### VALUE INFORMATION

	Actual	Assessed
Land	\$18,900	\$5,481
Improvement	-	-
Total	\$18,900	\$5,481

### IMPROVEMENTS

No improvements to display.

### LAND DETAILS

DESCRIPTION	EFFECTIVE ACRES*	EFFECTIVE SQ FT*	VALUE
Natural Resources	8.57	373,266	\$8,569
Natural Resources	10.33	450,018	\$10,331

\* Accounting for undivided interests and mixed use properties calculate smaller than the full property size.

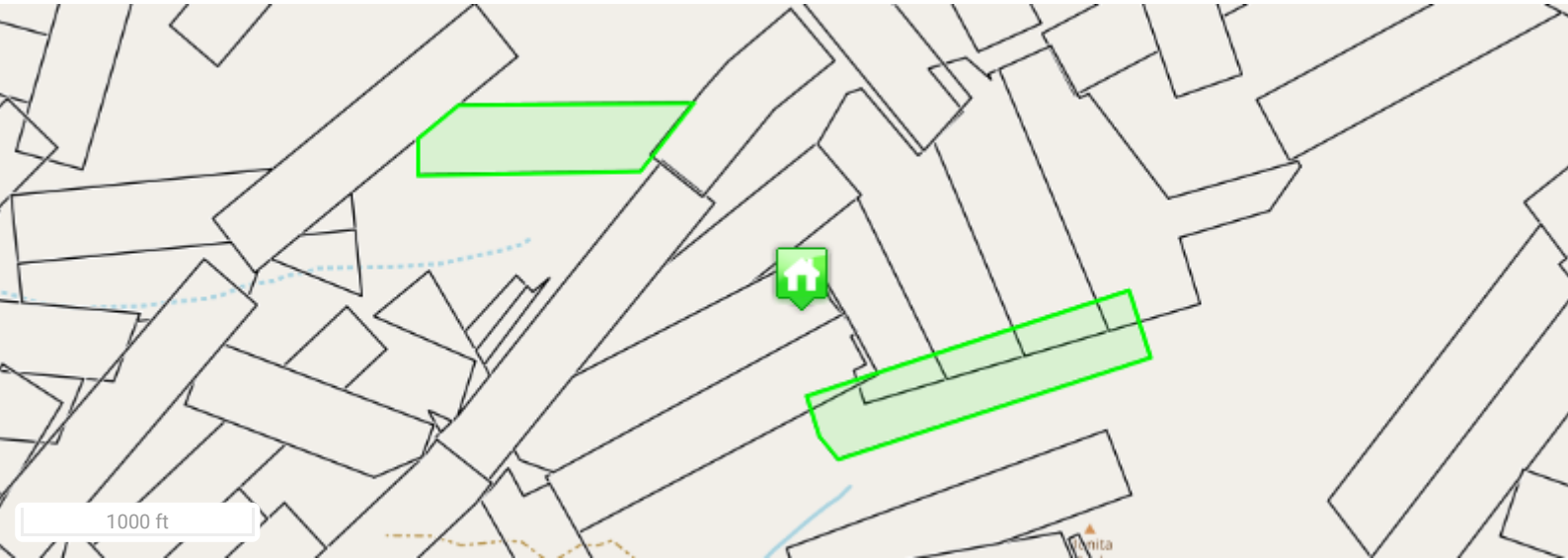
### TRANSFER HISTORY

SALE DATE	AMT	RECEPTION	TYPE	GRANTEES	GRANTORS
No items to display					

### MINING CLAIMS

CLAIM NAME		MINERAL SURVEY #	
+ PAYMASTER		18080	
Acres	10.13	Road	-
District	EUREKA MINING DISTRICT	Patent	45978.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-

+ WATERLOO		17429	
Acres	6.97	Road	-
District	EUREKA MINING DISTRICT	Patent	44554.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-



No Photo Available





# San Juan County Colorado Property and Maps

## San Juan County Colorado Property and Maps

Account #N1591  
SILVERTON, CO 81433

Total Value  
\$24,259

### OVERVIEW

#### KEY INFORMATION

Account #	N1591		Parcel #	47750160050006	
Name(s)	SUNNYSIDE GOLD CORP				
Mailing Address	5075 S SYRACUSE ST STE 800 DENVER CO 80237-2712				
Situs Address	SILVERTON, CO 81433				
Total Acres	24.26		Total Sq Ft	1,056,722	
Section	16	Township	42	Range	7
Tax District	101	Economic Area	-	Block	-
Plat Reference	-				
Legal Description	EMMA #1 - 17538, EMMA #2 - 17538, SMUGGLER - 1758				

#### VALUE INFORMATION

	Actual	Assessed
Land	\$24,259	\$7,035
Improvement	-	-
Total	\$24,259	\$7,035

### IMPROVEMENTS

No improvements to display.

### LAND DETAILS

DESCRIPTION	EFFECTIVE ACRES*	EFFECTIVE SQ FT*	VALUE
Natural Resources	6.22	270,769	\$6,216
Natural Resources	7.74	337,285	\$7,743
Natural Resources	10.30	448,668	\$10,300

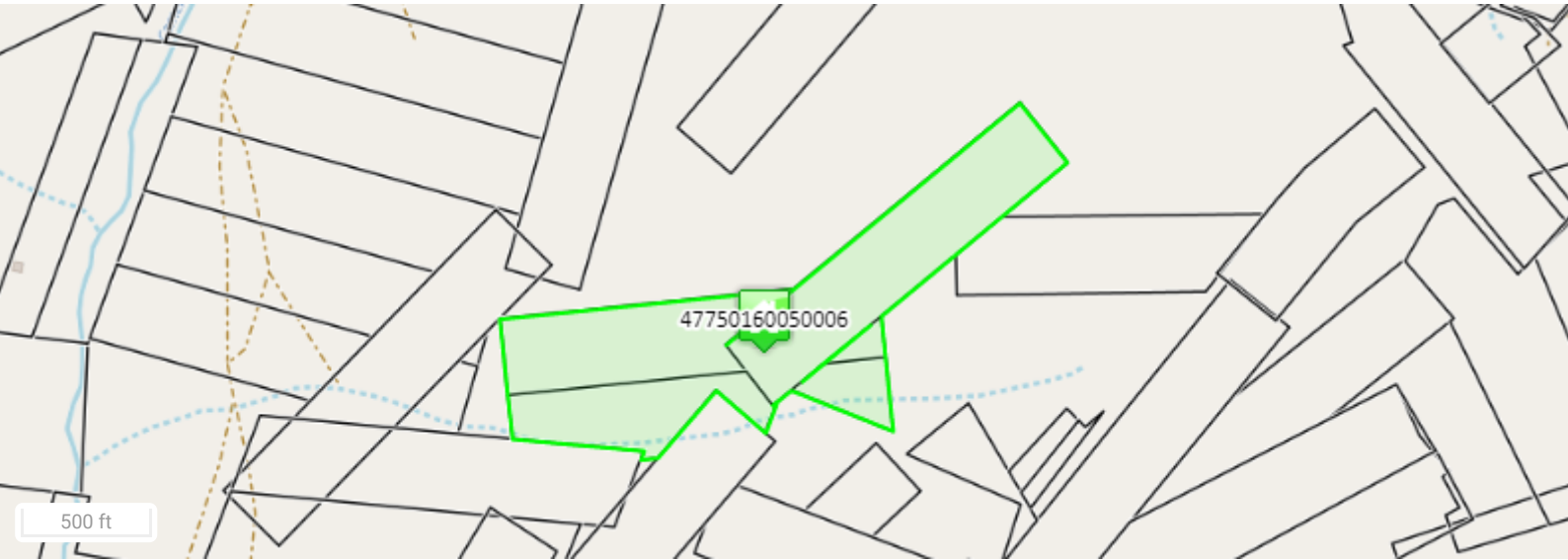
\* Accounting for undivided interests and mixed use properties calculate smaller than the full property size.

### TRANSFER HISTORY

SALE DATE	AMT	RECEPTION	TYPE	GRANTEES	GRANTORS
No items to display					

### MINING CLAIMS

CLAIM NAME		MINERAL SURVEY #	
+ EMMA #1		17538	
Acres	5.85	Road	Mogul Mine Rd
District	EUREKA MINING DISTRICT	Patent	44909.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-
+ EMMA #2		17538	
Acres	6.86	Road	Mogul Mine Rd
District	EUREKA MINING DISTRICT	Patent	44909.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-
+ SMUGGLER		1758	
Acres	9.85	Road	-
District	EUREKA MINING DISTRICT	Patent	14845.0000000
Mapping Status	Updated using BLM PLSS Intersected 2019		
Waste	-	Waterfront	-



No Photo Available









# San Juan County Colorado Property and Maps

## San Juan County Colorado Property and Maps

Account #N1760  
SILVERTON, CO 81433

Total Value  
\$113,439

### OVERVIEW

#### KEY INFORMATION

Account #	N1760		Parcel #	47750220050003	
Name(s)	SUNNYSIDE GOLD CORP				
Mailing Address	5075 S SYRACUSE ST STE 800 DENVER CO 80237-2712				
Situs Address	SILVERTON, CO 81433				
Total Acres	113.44		Total Sq Ft	4,941,403	
Section	22	Township	42	Range	7
Tax District	101	Economic Area	-	Block	-
Plat Reference	-				
Legal Description	AMA - 18849, BLUE HEEL - 18849, DOVER - 1690, GOLD PEAK - 16393, JOE - 18849, MILANO - 16393, RED - 18849, ROCK - 18849, ROSA - 18849, ROSSO - 18849, ROUENA O - 16393, TREASURE - 18849, YANKEE BOY - 18849				

#### VALUE INFORMATION

	Actual	Assessed
Land	\$113,439	\$32,898
Improvement	-	-
Total	\$113,439	\$32,898

### IMPROVEMENTS

No improvements to display.

### LAND DETAILS

DESCRIPTION	EFFECTIVE ACRES*	EFFECTIVE SQ FT*	VALUE
Natural Resources	5.71	248,728	\$5,710
Natural Resources	6.13	266,849	\$6,126
Natural Resources	6.43	280,004	\$6,428
Natural Resources	6.94	302,263	\$6,939
Natural Resources	7.67	334,192	\$7,672
Natural Resources	8.61	375,052	\$8,610
Natural Resources	10.00	435,600	\$10,000
Natural Resources	10.30	448,668	\$10,300
Natural Resources	10.33	449,975	\$10,330
Natural Resources	10.33	450,018	\$10,331

\* Accounting for undivided interests and mixed use properties calculate smaller than the full property size.

### TRANSFER HISTORY

SALE DATE	AMT	RECEPTION	TYPE	GRANTEES	GRANTORS
No items to display					

### MINING CLAIMS

CLAIM NAME		MINERAL SURVEY #	
+ AMA		18849	
Acres	10.31	Road	Upper Minnehaha
District	EUREKA MINING DISTRICT	Patent	220154.000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-
+ BLUE HEEL		18849	
Acres	10.28	Road	Upper Minnehaha
District	EUREKA MINING DISTRICT	Patent	220154.000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-
+ DOVER		1690	
Acres	10.37	Road	Upper Minnehaha
District	EUREKA MINING DISTRICT	Patent	14848.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-
+ GOLD PEAK		16393	
Acres	6.43	Road	Upper Minnehaha
District	EUREKA MINING DISTRICT	Patent	39587.0000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-
+ JOE		18849	
Acres	10.35	Road	Upper Minnehaha
District	EUREKA MINING DISTRICT	Patent	220154.000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-
+ MILANO		16393	
Acres	5.70	Road	Upper Minnehaha
District	EUREKA MINING DISTRICT	Patent	39587.0000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-
+ RED		18849	
Acres	6.09	Road	Upper Minnehaha
District	EUREKA MINING DISTRICT	Patent	220154.000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-
+ ROCK		18849	

CLAIM NAME		MINERAL SURVEY #	
Acres	10.30	Road	Upper Minnehaha
District	EUREKA MINING DISTRICT	Patent	220154.000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-

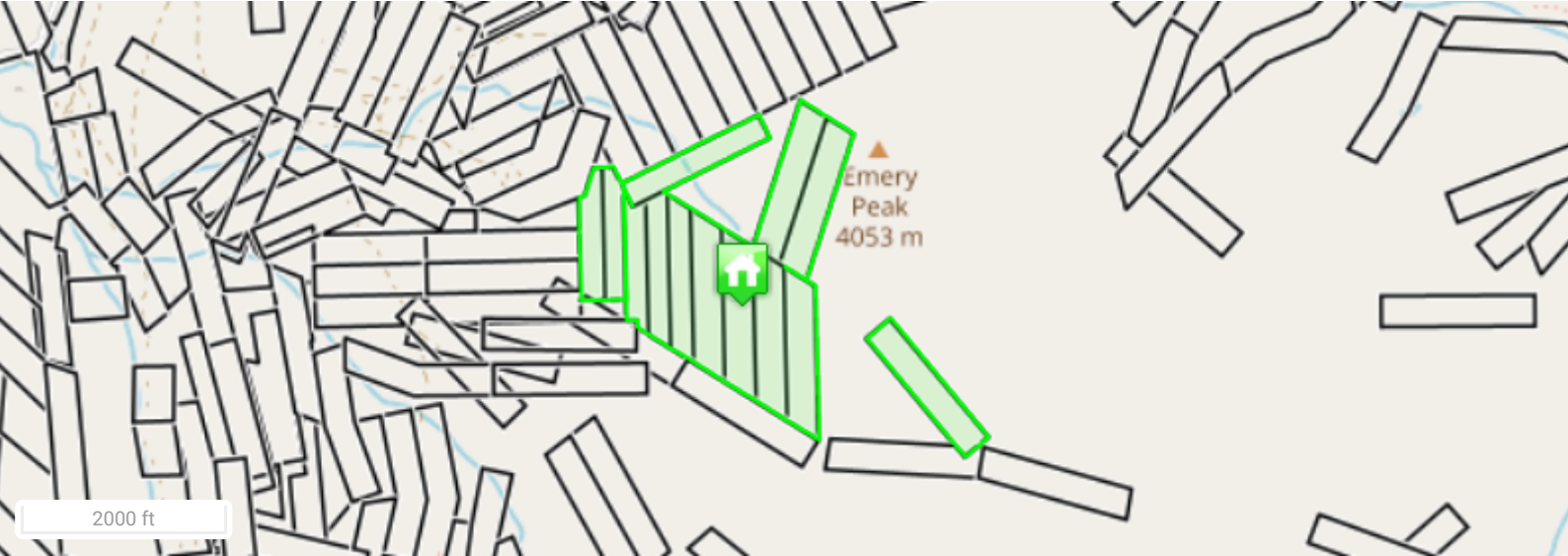
+ ROSA		18849	
Acres	10.31	Road	Upper Minnehaha
District	EUREKA MINING DISTRICT	Patent	220154.000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-

+ ROSSO		18849	
Acres	7.66	Road	Upper Minnehaha
District	EUREKA MINING DISTRICT	Patent	220154.000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-

+ ROUENA O		16393	
Acres	8.59	Road	Upper Minnehaha
District	EUREKA MINING DISTRICT	Patent	39587.0000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-

+ TREASURE		18849	
Acres	6.93	Road	Upper Minnehaha
District	EUREKA MINING DISTRICT	Patent	220154.000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-

+ YANKEE BOY		18849	
Acres	10.35	Road	Upper Minnehaha
District	EUREKA MINING DISTRICT	Patent	220154.000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-



No Photo Available





# San Juan County Colorado Property and Maps

## San Juan County Colorado Property and Maps

Account #N1777  
SILVERTON, CO 81433

Total Value  
\$10,330

### OVERVIEW

#### KEY INFORMATION

Account #	N1777		Parcel #	47750230050001	
Name(s)	SUNNYSIDE GOLD CORP				
Mailing Address	5075 S SYRACUSE ST STE 800 DENVER CO 80237-2712				
Situs Address	SILVERTON, CO 81433				
Total Acres	10.33		Total Sq Ft	449,975	
Section	23	Township	42	Range	7
Tax District	101	Economic Area	-	Block	-
Plat Reference	-				
Legal Description	BEAUBREC - 1709				

#### VALUE INFORMATION

	Actual	Assessed
Land	\$10,330	\$2,996
Improvement	-	-
Total	\$10,330	\$2,996

### IMPROVEMENTS

No improvements to display.

### LAND DETAILS

DESCRIPTION	EFFECTIVE ACRES*	EFFECTIVE SQ FT*	VALUE
Natural Resources	10.33	449,975	\$10,330

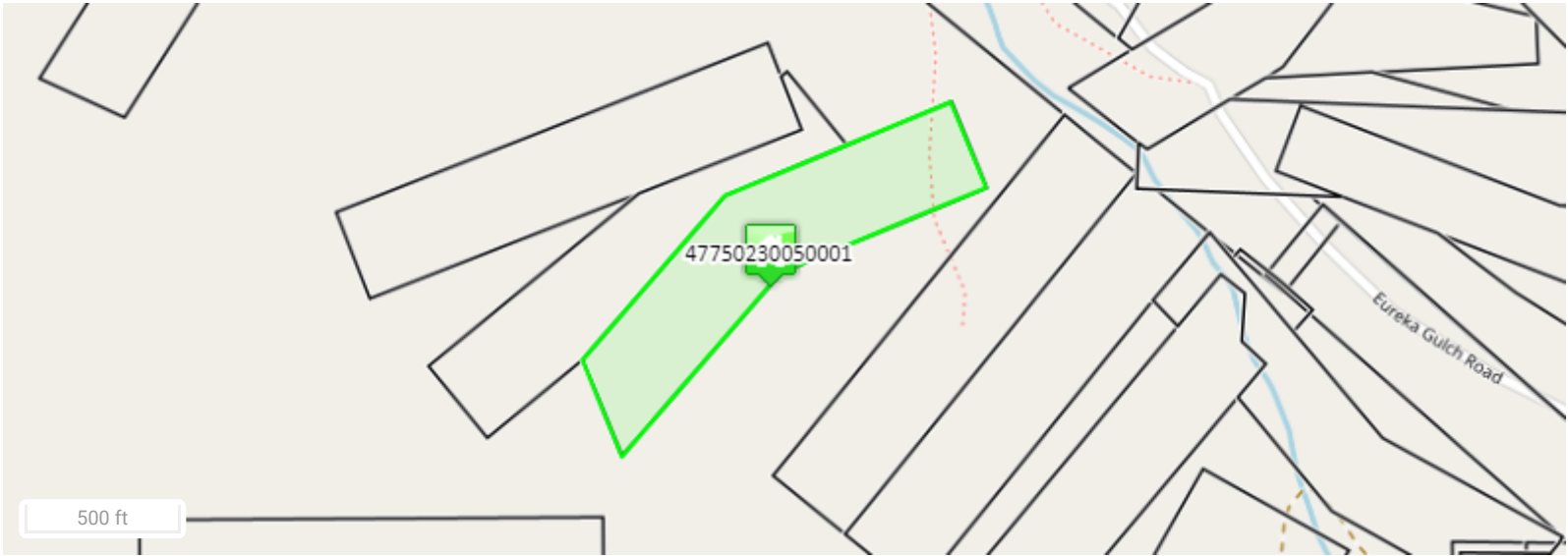
\* Accounting for undivided interests and mixed use properties calculate smaller than the full property size.

### TRANSFER HISTORY

SALE DATE	AMT	RECEPTION	TYPE	GRANTEES	GRANTORS
No items to display					

### MINING CLAIMS

CLAIM NAME		MINERAL SURVEY #	
+ BEAUBREC		1709	
Acres	10.32	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	14789.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-



No Photo Available







# San Juan County Colorado Property and Maps

## San Juan County Colorado Property and Maps

Account #N1778  
SILVERTON, CO 81433

Total Value  
\$44,270

### OVERVIEW

#### KEY INFORMATION

Account #	N1778		Parcel #	47750230050002	
Name(s)	SUNNYSIDE GOLD CORP				
Mailing Address	5075 S SYRACUSE ST STE 800 DENVER CO 80237-2712				
Situs Address	SILVERTON, CO 81433				
Total Acres	44.27		Total Sq Ft	1,928,402	
Section	23	Township	42	Range	7
Tax District	101	Economic Area	-	Block	-
Plat Reference	-				
Legal Description	A D SEARL - 1714, DANEBURG - 1780, HILDERBRAND - 1707, KNICKERBOCKER - 1717, UNDERWOOD - 1719				

#### VALUE INFORMATION

	Actual	Assessed
Land	\$44,270	\$12,839
Improvement	-	-
Total	\$44,270	\$12,839

### IMPROVEMENTS

No improvements to display.

### LAND DETAILS

DESCRIPTION	EFFECTIVE ACRES*	EFFECTIVE SQ FT*	VALUE
Natural Resources	7.70	335,412	\$7,700
Natural Resources	7.81	340,204	\$7,810
Natural Resources	8.10	352,836	\$8,100
Natural Resources	10.33	449,975	\$10,330

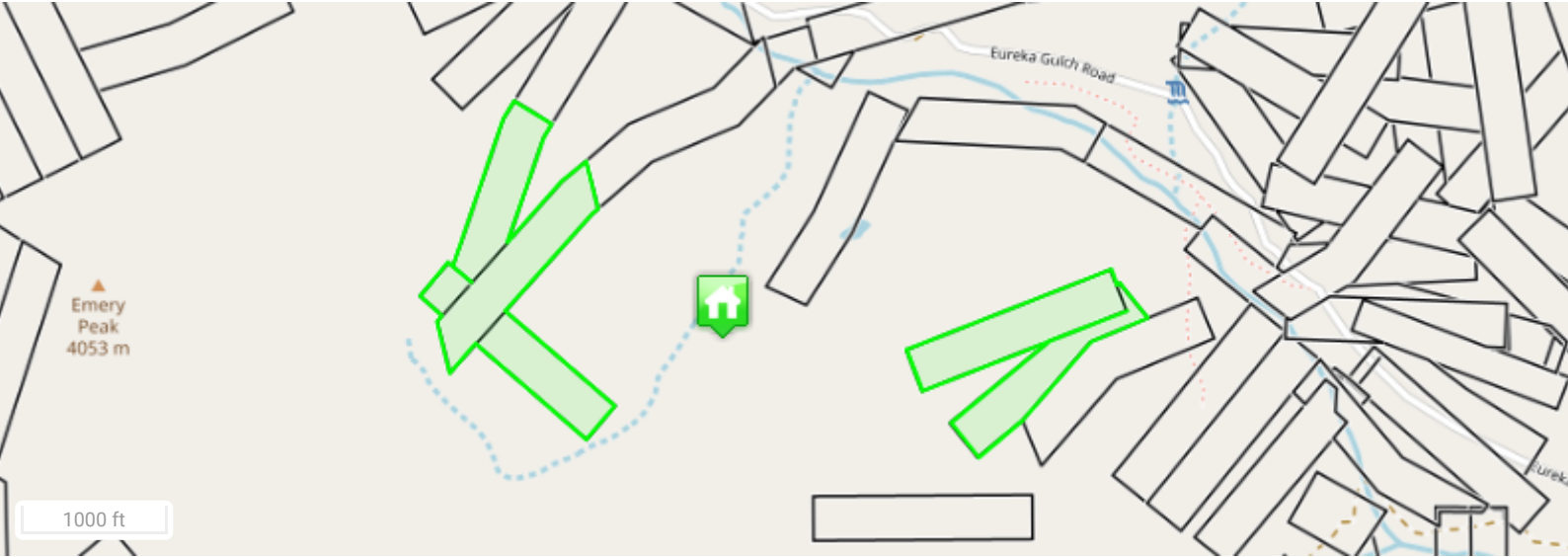
\* Accounting for undivided interests and mixed use properties calculate smaller than the full property size.

### TRANSFER HISTORY

SALE DATE	AMT	RECEPTION	TYPE	GRANTEES	GRANTORS
No items to display					

### MINING CLAIMS

CLAIM NAME		MINERAL SURVEY #	
+ A D SEARL		1714	
Acres	10.50	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	12256.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-
+ DANEBURG		1780	
Acres	8.59	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	11522.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-
+ HILDERBRAND		1707	
Acres	7.91	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	13078.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-
+ KNICKERBOCKER		1717	
Acres	9.76	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	12258.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-
+ UNDERWOOD		1719	
Acres	7.45	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	12260.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-



No Photo Available





# San Juan County Colorado Property and Maps

## San Juan County Colorado Property and Maps

Account #N1785  
SILVERTON, CO 81433

Total Value  
\$89,193

### OVERVIEW

#### KEY INFORMATION

Account #	N1785		Parcel #	47750240050001	
Name(s)	SUNNYSIDE GOLD CORP				
Mailing Address	5075 S SYRACUSE ST STE 800 DENVER CO 80237-2712				
Situs Address	SILVERTON, CO 81433				
Total Acres	89.19		Total Sq Ft	3,885,248	
Section	14	Township	42	Range	7
Tax District	101	Economic Area	-	Block	-
Plat Reference	-				
Legal Description	BLUCHER - 1400, EIGHTY NINE - 16997, ESTEY - 13189, LIZZIE NORRIS - 1702, GRAND - 2573, GRAND PRIZE - 1701, GREAT EASTERN - 1691, NEW YORK - 8399, WELLINGTON - 16997, SUNBEAM - 1419				

#### VALUE INFORMATION

	Actual	Assessed
Land	\$89,193	\$25,868
Improvement	-	-
Total	\$89,193	\$25,868

### IMPROVEMENTS

No improvements to display.

### LAND DETAILS

DESCRIPTION	EFFECTIVE ACRES*	EFFECTIVE SQ FT*	VALUE
Natural Resources	4.84	211,005	\$4,844
Natural Resources	6.84	297,950	\$6,840
Natural Resources	6.95	302,742	\$6,950
Natural Resources	9.33	406,415	\$9,330
Natural Resources	9.61	418,612	\$9,610
Natural Resources	10.30	448,581	\$10,298
Natural Resources	10.33	449,975	\$10,330
Natural Resources	10.33	450,018	\$10,331

\* Accounting for undivided interests and mixed use properties calculate smaller than the full property size.

### TRANSFER HISTORY

SALE DATE	AMT	RECEPTION	TYPE	GRANTEES	GRANTORS
No items to display					

### MINING CLAIMS

CLAIM NAME		MINERAL SURVEY #	
+ BLUCHER		1400	
Acres	10.31	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	11228.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-
+ EIGHTY NINE		16997	
Acres	10.32	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	42151.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-
+ ESTEY		13189	
Acres	4.90	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	32824.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-
+ GRAND		2573	
Acres	8.45	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	16424.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-
+ GRAND PRIZE		1701	
Acres	6.77	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	11454.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-
+ GREAT EASTERN		1691	
Acres	10.23	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	10696.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-
+ LIZZIE NORRIS		1702	
Acres	6.96	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	11455.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-
+ NEW YORK		8399	

CLAIM NAME		MINERAL SURVEY #	
Acres	9.33	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	26325.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-

+

SUNBEAM

1419

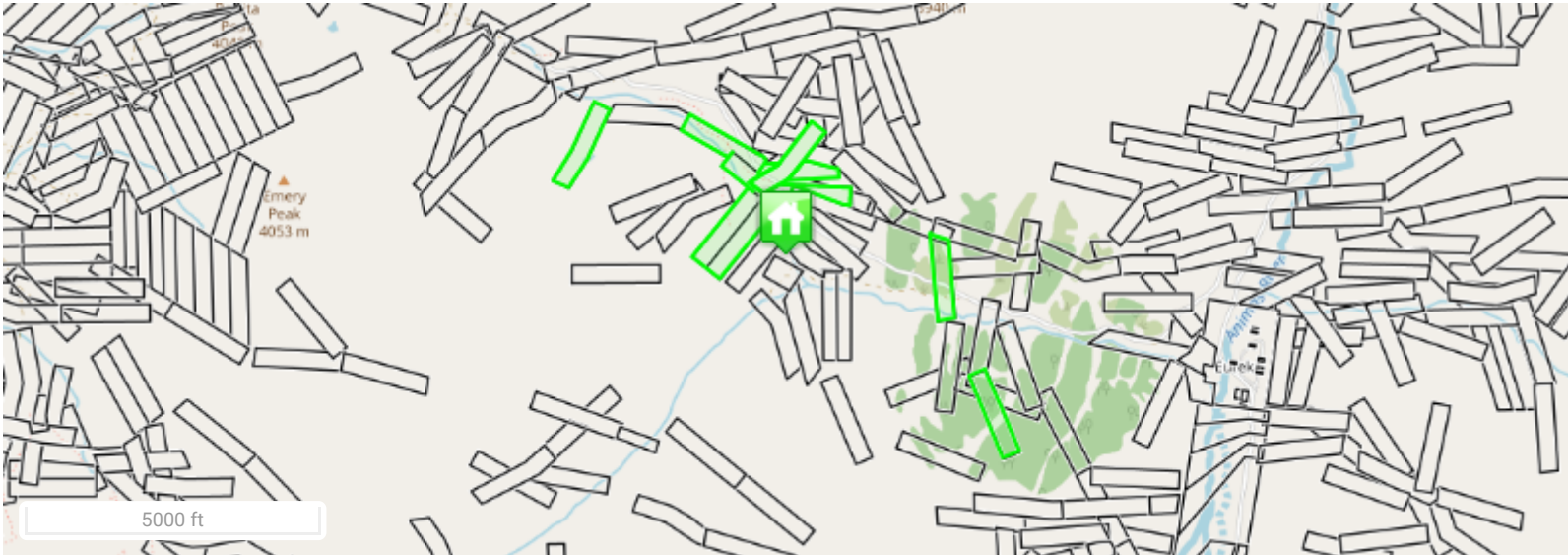
Acres	10.28	Road	-
District	EUREKA MINING DISTRICT	Patent	11394.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-

+

WELLINGTON

16997

Acres	10.12	Road	Sunnyside Gulch
District	EUREKA MINING DISTRICT	Patent	42151.0000000
Mapping Status	_Mapping not checked yet		
Waste	-	Waterfront	-



No Photo Available







# San Juan County Colorado Property and Maps

## San Juan County Colorado Property and Maps

Account #N2317  
SILVERTON, CO 81433

Total Value  
\$47,729

### OVERVIEW

#### KEY INFORMATION

Account #	N2317		Parcel #	48290090010033	
Name(s)	SUNNYSIDE GOLD CORP				
Mailing Address	5075 S SYRACUSE ST STE 800 DENVER CO 80237-2712				
Situs Address	SILVERTON, CO 81433				
Total Acres	22.73		Total Sq Ft	990,119	
Section	9	Township	41	Range	7
Tax District	101	Economic Area	-	Block	-
Plat Reference	-				
Legal Description	BEND PLACER - 11596, C H MILL SITE - 20594. FORMERLY PART OF SCHEDULE 48290090010031				

#### VALUE INFORMATION

	Actual	Assessed
Land	\$47,729	\$13,842
Improvement	-	-
Total	\$47,729	\$13,842

### IMPROVEMENTS

No improvements to display.

### LAND DETAILS

DESCRIPTION	EFFECTIVE ACRES*	EFFECTIVE SQ FT*	VALUE
Natural Resources	4.73	206,039	\$18,689
Natural Resources	18.00	784,080	\$29,040

\* Accounting for undivided interests and mixed use properties calculate smaller than the full property size.

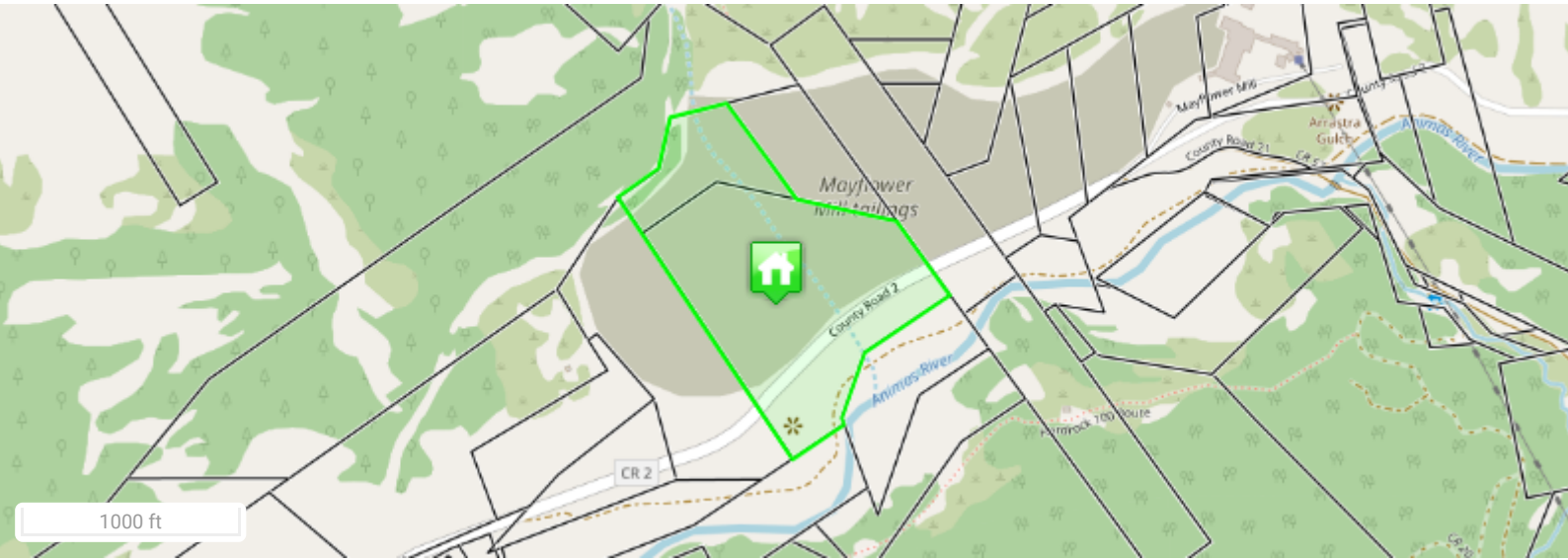
### TRANSFER HISTORY

SALE DATE	AMT	RECEPTION	TYPE	GRANTEES	GRANTORS
07/12/2017	\$0	151218	Quit Claim Deed(QCD)	SUNNYSIDE GOLD CORP	PERINO LARRY R

### MINING CLAIMS

CLAIM NAME		MINERAL SURVEY #	
+ BEND PLACER		11596	
Acres	21.25	Road	Former State Hwy 110 A
District	ANIMAS MINING DISTRICT	Patent	28491.0000000
Mapping Status	Updated using BLM data		
Waste	Remediated	Waterfront	-

+ C H MILL SITE		20594	
Acres	4.73	Road	-
District	ANIMAS MINING DISTRICT	Patent	1126475.00000
Mapping Status	Updated using BLM data		
Waste	Remediated	Waterfront	-



No Photo Available





# San Juan County Colorado Property and Maps

## San Juan County Colorado Property and Maps

Account #N2323  
1949 COUNTY ROAD 110 B, SILVERTON, CO 81433

Total Value  
\$101,569

### OVERVIEW

#### KEY INFORMATION

Account #	N2323		Parcel #	48290090010039	
Name(s)	SUNNYSIDE GOLD CORP				
Mailing Address	5075 S SYRACUSE ST STE 800 DENVER CO 80237-2712				
Situs Address	1949 COUNTY ROAD 110 B, SILVERTON, CO 81433				
Total Acres	32.83		Total Sq Ft	1,430,075	
Section	9	Township	41	Range	7
Tax District	101	Economic Area	-	Block	-
Plat Reference	-				
Legal Description	SUNNYSIDE GOLD CORPORATION - PERINO BOUNDARY ADJUSTMENT PARCEL C, RECORDED AS RECEPTION NO. 151146, IN SUSPENDED T41N R7W. FORMERLY PART OF ANN HARRIS PLACER - 11596 AND FORMER PARCEL BB, RECORDED AS RECEPTION NO. 186140. FORMERLY PART OF SCHEDULES 48290090010003 AND 48290090010036.BEGINNING at corner AP 10, defined by a standard BLM monument, whence BLM Eureka Control Monument No. 4 (EC-4) in Suspended Township 41 North, Range 7 West, New Mexico Principle Meridian, County of San Juan, State of Colorado, defined by a 3-1 / 4 brass cap set in an outcrop, bears N7322'09E a distance of 3,415.83 feet; all other bearings herein being relative thereto; thence, S4829'47E, a distance of 617.05 feet to the northerly boundary of San Juan County Road No. 2, said road being described at Reception No. 118270 in the records of the San Juan County Clerk and Recorder, defined by a rebar and survey cap LS 31160; thence, S4244'38W, a distance of 54.60 ... See Full Legal Description				

#### VALUE INFORMATION

	Actual	Assessed
Land	\$101,569	\$29,455
Improvement	-	-
Total	\$101,569	\$29,455

### IMPROVEMENTS

No improvements to display.

### LAND DETAILS

DESCRIPTION	EFFECTIVE ACRES*	EFFECTIVE SQ FT*	VALUE
Natural Resources	32.83	1,430,075	\$101,569

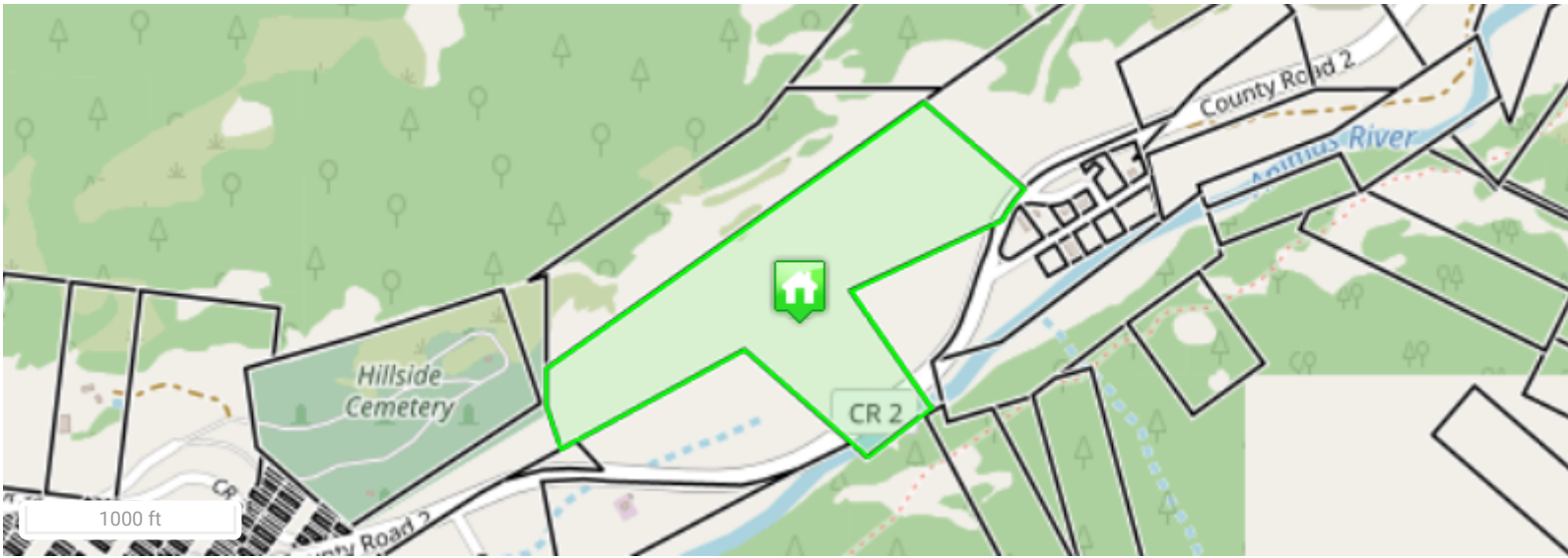
\* Accounting for undivided interests and mixed use properties calculate smaller than the full property size.

### TRANSFER HISTORY

SALE DATE	AMT	RECEPTION	TYPE	GRANTEES	GRANTORS
No items to display					

### MINING CLAIMS

CLAIM NAME		MINERAL SURVEY #	
+ ANN HARRIS PLACER (PARCEL C of Sunnyside Gold Corporation - Perino Boundary Adjustment)		11596	
Acres	34.94	Road	WATER TANK ROAD
District	-	Patent	28491.0000000
Mapping Status	Updated using BLM data		
Waste	Remediated	Waterfront	Animas



No Photo Available





# San Juan County Colorado Property and Maps

## San Juan County Colorado Property and Maps

Account #N2325  
SILVERTON, CO 81433

Total Value  
\$67,884

### OVERVIEW

#### KEY INFORMATION

Account #	N2325		Parcel #	48290090010041	
Name(s)	SUNNYSIDE GOLD CORP				
Mailing Address	5075 S SYRACUSE ST STE 800 DENVER CO 80237-2712				
Situs Address	SILVERTON, CO 81433				
Total Acres	5.91		Total Sq Ft	257,440	
Section	9	Township	41	Range	7
Tax District	101	Economic Area	-	Block	-
Plat Reference	-				
Legal Description	SUNNYSIDE GOLD CORPORATION - PERINO BOUNDARY ADJUSTMENT PARCEL E, RECORDED AS RECEPTION NO. 151146, IN SUSPENDED T41N R7W. FORMERLY PORTIONS OF M D THATCHER - 17699 AND POLAR STAR MILL SITE - 7608. FORMERLY PART OF SCHEDULE 48290090010031 AND 48290090010032.BEGINNING at corner AP 1, defined by a standard BLM monument, whence BLM Eureka Control Monument No. 4 (EC-4) in Suspended Township 41 North, Range 7 West, New Mexico Principle Meridian, County of San Juan, State of Colorado, defined by a 3-1 / 4 brass cap set in an outcrop, bears N6836'14E a distance of 1,626.56 feet; all other bearings herein being relative thereto; thence, S53 10'36W, a distance of 558.00 feet to a standard BLM monument; thence, S4322' 12W, a distance of 189.02 feet to the northerly boundary of San Juan County Road No. 2, said road being described at Reception No. 118270 ... See Full Legal Description				

#### VALUE INFORMATION

	Actual	Assessed
Land	\$67,884	\$19,686
Improvement	-	-
Total	\$67,884	\$19,686

### IMPROVEMENTS

No improvements to display.

### LAND DETAILS

DESCRIPTION	EFFECTIVE ACRES*	EFFECTIVE SQ FT*	VALUE
Natural Resources	5.91	257,440	\$67,884

\* Accounting for undivided interests and mixed use properties calculate smaller than the full property size.

### TRANSFER HISTORY

SALE DATE	AMT	RECEPTION	TYPE	GRANTEES	GRANTORS
07/05/2017	\$0	151217	Quit Claim Deed(QCD)	SUNNYSIDE GOLD CORPORATION c/o:	PERINO LARRY R SUNNYSIDE GOLD CORP

### MINING CLAIMS

CLAIM NAME		MINERAL SURVEY #	
+ POLAR STAR M S (PARCEL E of Sunnyside Gold Corporation - Perino Boundary Adjustment)		7608	
Acres	5.73	Road	-
District	-	Patent	0.000000000000
Mapping Status	Updated using BLM data		
Waste	Remediated	Waterfront	-



No Photo Available







# San Juan County Colorado Property and Maps

## San Juan County Colorado Property and Maps

Account #N2326  
SILVERTON, CO 81433

Total Value  
\$57,599

### OVERVIEW

#### KEY INFORMATION

Account #	N2326		Parcel #	48290090010042	
Name(s)	SUNNYSIDE GOLD CORP				
Mailing Address	5075 S SYRACUSE ST STE 800 DENVER CO 80237-2712				
Situs Address	SILVERTON, CO 81433				
Total Acres	12.66		Total Sq Ft	551,470	
Section	9	Township	41	Range	7
Tax District	101	Economic Area	-	Block	-
Plat Reference	-				
Legal Description	SUNNYSIDE GOLD CORPORATION - PERINO BOUNDARY ADJUSTMENT PARCEL F, RECORDED AS RECEPTION NO. 151146, IN SUSPENDED T41N R7W. FORMERLY PART OF PETER PLACER - 11596, AND SMALL PORTIONS OF M D THATCHER - 17699 AND BLM TRACT 41. FORMERLY PART OF SCHEDULE 48290090010031 AND 48290090010032. BEGINNING at corner AP1, defined by a standard BLM monument, whence BLM Eureka Control Monument No. 4 (EC-4) in Suspended Township 41 North, Range 7 West, New Mexico Principle Meridian, County of San Juan, State of Colorado, defined by a 3-1 / 4 brass cap set in an outcrop, bears N68 36' 14E a distance of 1,626.56 feet; all other bearings herein being relative thereto; thence, S 14 1 O' 51 E, a distance of 381.4 7 feet to a standard BLM monument; thence, S8911'11E, a distance of 387.53 feet to a rebar and cap, LS 31160; thence N5736'21E, a distance of 170.66 feet to a rebar and cap, LS 31160; thence N3227' 44W, a distance of 1229.46 feet to ... See Full Legal Description				

#### VALUE INFORMATION

	Actual	Assessed
Land	\$57,599	\$16,704
Improvement	-	-
Total	\$57,599	\$16,704

### IMPROVEMENTS

No improvements to display.

### LAND DETAILS

DESCRIPTION	EFFECTIVE ACRES*	EFFECTIVE SQ FT*	VALUE
Natural Resources	12.66	551,470	\$57,599

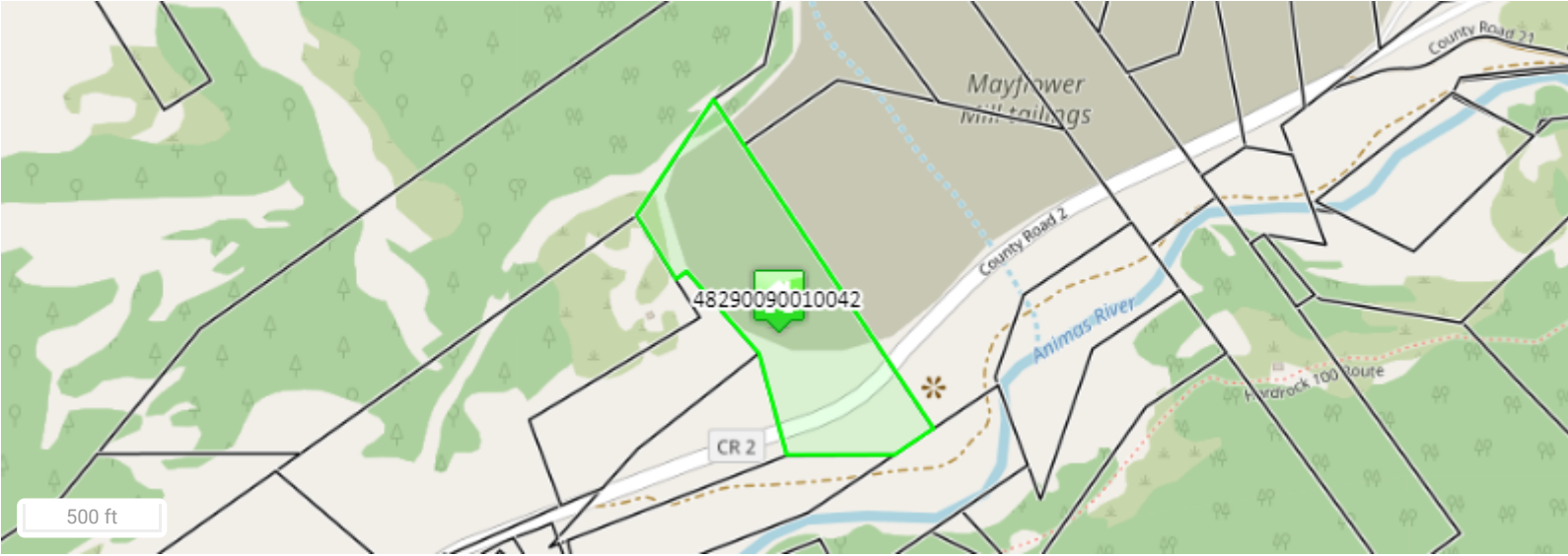
\* Accounting for undivided interests and mixed use properties calculate smaller than the full property size.

### TRANSFER HISTORY

SALE DATE	AMT	RECEPTION	TYPE	GRANTEES	GRANTORS
07/05/2017	\$0	151217	Quit Claim Deed(QCD)	SUNNYSIDE GOLD CORPORATION c/o:	PERINO LARRY R SUNNYSIDE GOLD CORP

### MINING CLAIMS

CLAIM NAME		MINERAL SURVEY #	
+ PETER PLACER (PARCEL F of Sunnyside Gold Corporation - Perino Boundary Adjustment)		11596	
Acres	12.75	Road	Former State Hwy 110 A
District	-	Patent	0.000000000000
Mapping Status	Updated using BLM data		
Waste	Remediated	Waterfront	-



No Photo Available





# San Juan County Colorado Property and Maps

## San Juan County Colorado Property and Maps

Account #N2327  
1949 COUNTY ROAD 110 B, SILVERTON, CO 81433

Total Value  
\$144,008

### OVERVIEW

#### KEY INFORMATION

Account #	N2327		Parcel #	48290090010043	
Name(s)	SUNNYSIDE GOLD CORP				
Mailing Address	5075 S SYRACUSE ST STE 800 DENVER CO 80237-2712				
Situs Address	1949 COUNTY ROAD 110 B, SILVERTON, CO 81433				
Total Acres	38.14		Total Sq Ft	1,661,422	
Section	9	Township	41	Range	7
Tax District	101	Economic Area	-	Block	-
Plat Reference	-				
Legal Description	BLAIR PLACER - 841 (Part), GOLD - 14012, JEANNETTE ROUX PLACER 11596 MINERAL RIGHTS ONLY, RIVERSIDE (PART) - 8801, H V B MILL SITE - 20594 B. FORMERLY PART OF SCHEDULE 48290090010003				

#### VALUE INFORMATION

	Actual	Assessed
Land	\$144,008	\$41,763
Improvement	-	-
Total	\$144,008	\$41,763

### IMPROVEMENTS

No improvements to display.

### LAND DETAILS

DESCRIPTION	EFFECTIVE ACRES*	EFFECTIVE SQ FT*	VALUE
Mineral	8.13	353,925	\$447
Natural Resources	0.68	29,403	\$55,675
Natural Resources	4.74	206,518	\$3,698
Natural Resources	10.00	435,600	\$17,800
Natural Resources	14.60	635,976	\$66,388

\* Accounting for undivided interests and mixed use properties calculate smaller than the full property size.

### TRANSFER HISTORY

SALE DATE	AMT	RECEPTION	TYPE	GRANTEES	GRANTORS
No items to display					

### MINING CLAIMS

CLAIM NAME		MINERAL SURVEY #	
+ BLAIR PLACER (part)		841	
Acres	23.88	Road	-
District	0	Patent	7983.00000000
Mapping Status	Updated using BLM data; Roughly excepting State Assessed and County portions		
Waste	Remediated	Waterfront	Animas
+ GOLD		14012	
Acres	10.50	Road	Former State Hwy 110 A
District	ANIMAS MINING DISTRICT	Patent	34052.00000000
Mapping Status	Updated using BLM data		
Waste	Remediated	Waterfront	-
+ H V B MILL SITE		20594	
Acres	4.68	Road	-
District	0	Patent	1126475.00000
Mapping Status	Updated using BLM data		
Waste	Remediated	Waterfront	-
+ JEANNETTE ROUX PLACER (Tailings Pond Part)		11596	
Acres	5.61	Road	Former State Hwy 110 A
District	-	Patent	28491.00000000
Mapping Status	Updated using BLM data		
Waste	Remediated	Waterfront	-
+ RIVERSIDE		8801	
Acres	10.18	Road	Former State Hwy 110 A
District	ANIMAS MINING DISTRICT	Patent	25291.00000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	Animas



No Photo Available





# San Juan County Colorado Property and Maps

## San Juan County Colorado Property and Maps

Account #N2328  
SILVERTON, CO 81433

Total Value  
\$9,331

### OVERVIEW

#### KEY INFORMATION

Account #	N2328		Parcel #	48290090010044	
Name(s)	SUNNYSIDE GOLD CORP				
Mailing Address	5075 S SYRACUSE ST STE 800 DENVER CO 80237-2712				
Situs Address	SILVERTON, CO 81433				
Total Acres	10.33		Total Sq Ft	449,975	
Section	9	Township	41	Range	7
Tax District	101	Economic Area	-	Block	-
Plat Reference	-				
Legal Description	TRACTS 42, 43, 44, 45 AND PARCEL DD IN T41N R7W				

#### VALUE INFORMATION

	Actual	Assessed
Land	\$9,331	\$2,706
Improvement	-	-
Total	\$9,331	\$2,706

### IMPROVEMENTS

No improvements to display.

### LAND DETAILS

DESCRIPTION	EFFECTIVE ACRES*	EFFECTIVE SQ FT*	VALUE
Natural Resources	0.03	1,307	\$30
Natural Resources	0.19	8,276	\$190
Natural Resources	1.71	74,488	\$1,710
Natural Resources	3.86	168,142	\$3,860
Natural Resources	4.54	197,762	\$3,541

\* Accounting for undivided interests and mixed use properties calculate smaller than the full property size.

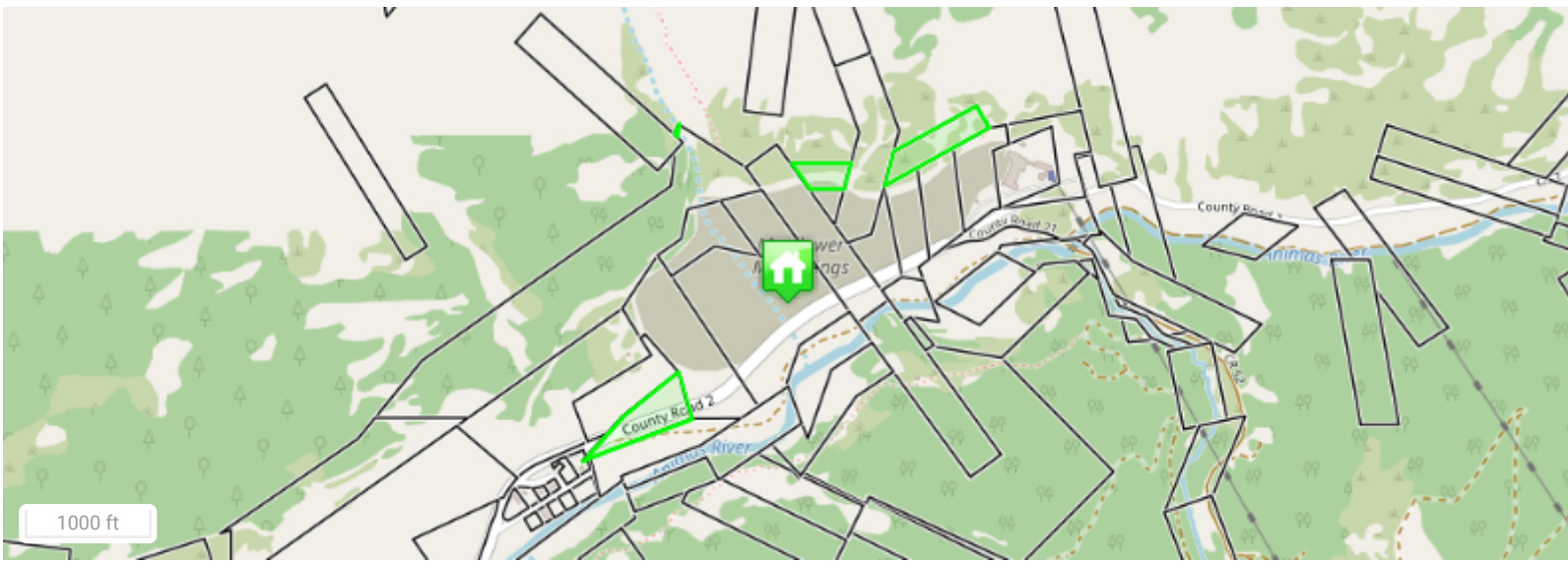
### TRANSFER HISTORY

SALE DATE	AMT	RECEPTION	TYPE	GRANTEES	GRANTORS
10/28/2011	\$0	148219	Patent(PTNT)	SUNNYSIDE GOLD CORP	UNITED STATES OF AMERICA

### MINING CLAIMS

CLAIM NAME		MINERAL SURVEY #	
+ TRACT 44		0	
Acres	4.54	Road	Former State Hwy 110 A
District	ANIMAS MINING DISTRICT	Patent	148219.000000
Mapping Status	Updated using BLM data		
Waste	Remediated	Waterfront	-





No Photo Available





# San Juan County Colorado Property and Maps

## San Juan County Colorado Property and Maps

Account #N2347  
SILVERTON, CO 81433

Total Value  
\$20,477

### OVERVIEW

#### KEY INFORMATION

Account #	N2347		Parcel #	48290100010006	
Name(s)	SUNNYSIDE GOLD CORP				
Mailing Address	5075 S SYRACUSE ST STE 800 DENVER CO 80237-2712				
Situs Address	SILVERTON, CO 81433				
Total Acres	23.43		Total Sq Ft	1,020,698	
Section	5	Township	41	Range	7
Tax District	101	Economic Area	-	Block	-
Plat Reference	-				
Legal Description	BUENA VISTA - 14012, M B MILLSITE - 20595 B, N N MILLSITE - 20595 B, T H W M S TRACT A - 20595 B, T H W M S TRACT B - 20595 B				

#### VALUE INFORMATION

	Actual	Assessed
Land	\$20,477	\$5,938
Improvement	-	-
Total	\$20,477	\$5,938

### IMPROVEMENTS

No improvements to display.

### LAND DETAILS

DESCRIPTION	EFFECTIVE ACRES*	EFFECTIVE SQ FT*	VALUE
Natural Resources	0.87	37,897	\$679
Natural Resources	3.35	145,926	\$2,613
Natural Resources	4.49	195,367	\$3,498
Natural Resources	4.73	205,908	\$3,687
Natural Resources	10.00	435,600	\$10,000

\* Accounting for undivided interests and mixed use properties calculate smaller than the full property size.

### TRANSFER HISTORY

SALE DATE	AMT	RECEPTION	TYPE	GRANTEES	GRANTORS
No items to display					

### MINING CLAIMS

CLAIM NAME		MINERAL SURVEY #	
+ BUENA VISTA		18400	
Acres	10.43	Road	Timber
District	ANIMAS MINING DISTRICT	Patent	46983.0000000
Mapping Status	Updated using BLM data		
Waste	-	Waterfront	-
+ M B MILL SITE		20595	
Acres	4.49	Road	Former State Hwy 110 A
District	ANIMAS MINING DISTRICT	Patent	1120728.00000
Mapping Status	Updated using BLM data		
Waste	Remediated	Waterfront	-
+ N N MILL SITE		20595	
Acres	4.73	Road	Former State Hwy 110 A
District	ANIMAS MINING DISTRICT	Patent	1120728.00000
Mapping Status	Updated using BLM data		
Waste	Remediated	Waterfront	-
+ T H W MILL SITE (TRACT A)		20595	
Acres	3.35	Road	Former State Hwy 110 A
District	ANIMAS MINING DISTRICT	Patent	1120728.00000
Mapping Status	Updated using BLM data		
Waste	Remediated	Waterfront	-
+ T H W MILL SITE (TRACT B)		20595	
Acres	0.87	Road	-
District	ANIMAS MINING DISTRICT	Patent	1120728.00000
Mapping Status	Updated using BLM data		
Waste	Remediated	Waterfront	-



No Photo Available



# Appendix E

## Physical Settings Report



## Property Information

Order Number:	22100605183p
Date Completed:	October 11, 2022
Project Number:	900.B11
Project Property:	San Juan County Mining Parcels Phase I ESA San Juan County Silverton CO
Coordinates:	
Latitude:	37.88390697
Longitude:	-107.60897426
UTM Northing:	4190055.19615 Meters
UTM Easting:	268560.61134 Meters
UTM Zone:	UTM Zone 13S
Elevation:	12,124.13 ft
Slope Direction:	SSE

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The ERIS **Physical Setting Report - PSR** provides comprehensive information about the physical setting around a site and includes a complete overview of topography and surface topology, in addition to hydrologic, geologic and soil characteristics. The location and detailed attributes of oil and gas wells, water wells, public water systems and radon are also included for review.

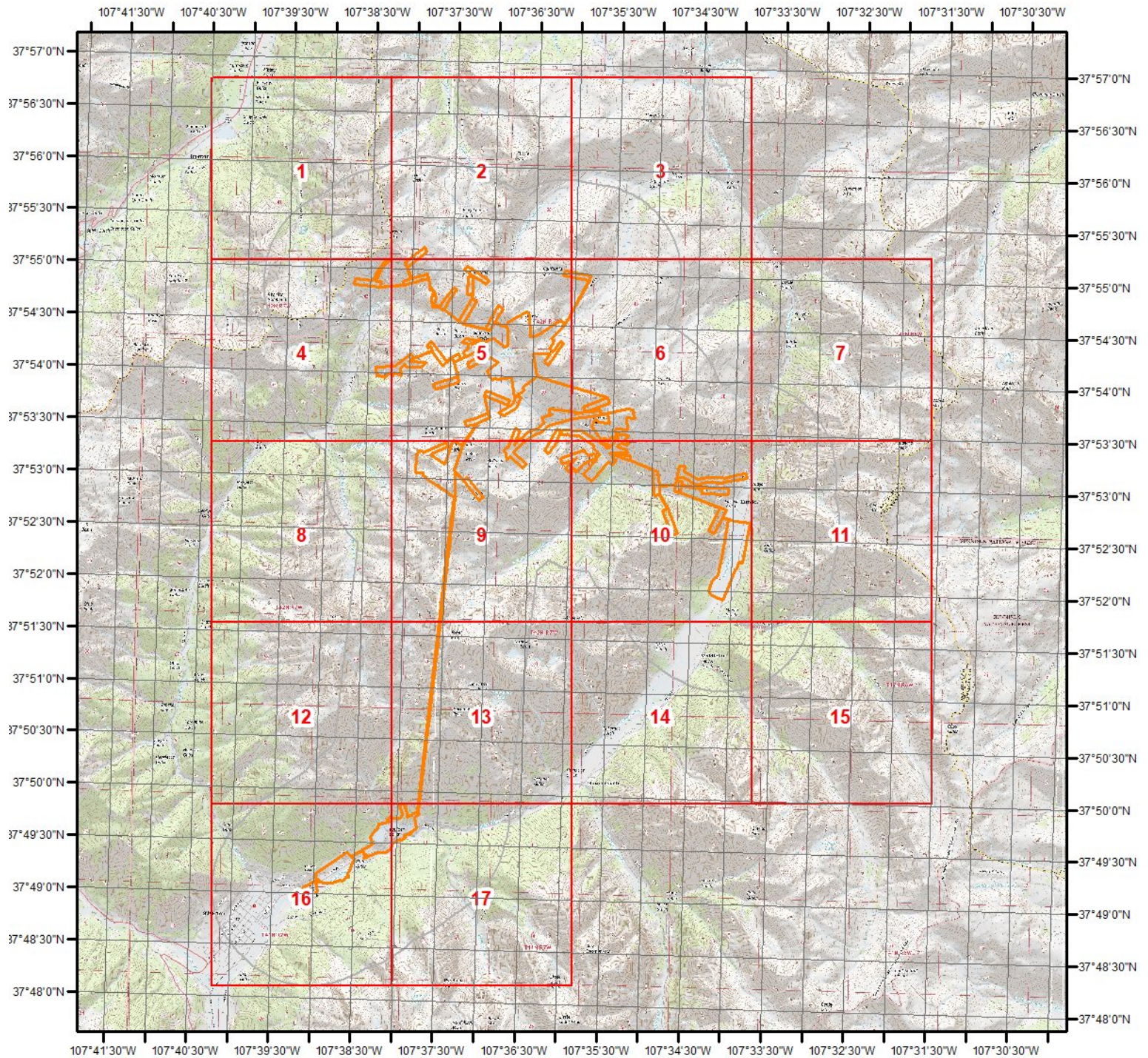
The compilation of both physical characteristics of a site and additional attribute data is useful in assessing the impact of migration of contaminants and subsequent impact on soils and groundwater.

### Disclaimer

This Report does not provide a full environmental evaluation for the site or adjacent properties. Please see the terms and disclaimer at the end of the Report for greater detail.



## Topographic Information



**Current USGS Topo (2016)**

0.0 0.4 0.8 1.2 1.6 2 2.4 Miles



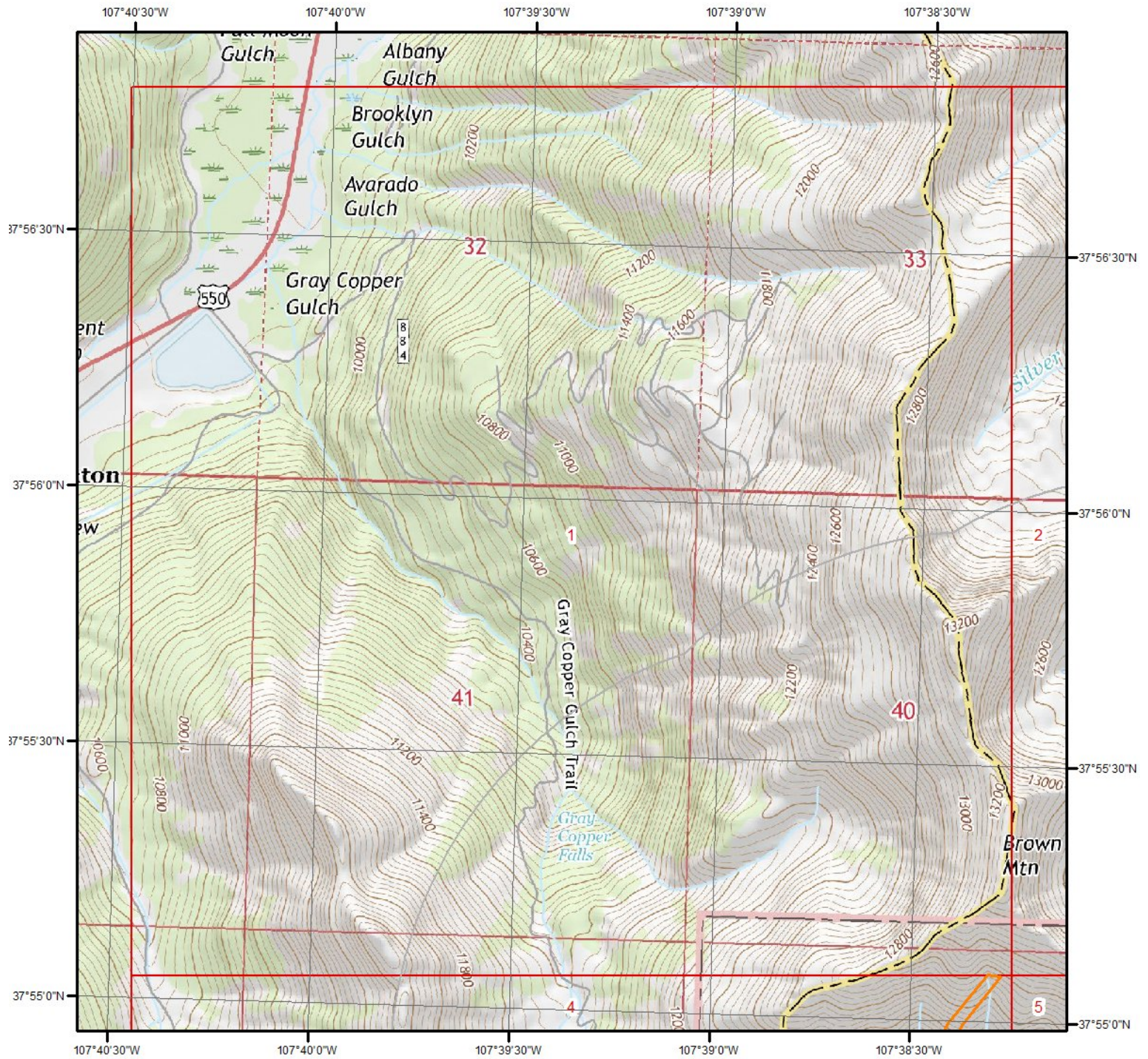
**Quadrangle(s): Engineer Mountain,CO; Handies Peak,CO; Howardsville,CO;  
Ironton,CO; Ophir,CO; Pole Creek Mountain,CO; Redcloud Peak,CO;**



Source: USGS 7.5 Minute Topographic Map



# Topographic Information



Current USGS Topo - Page 1



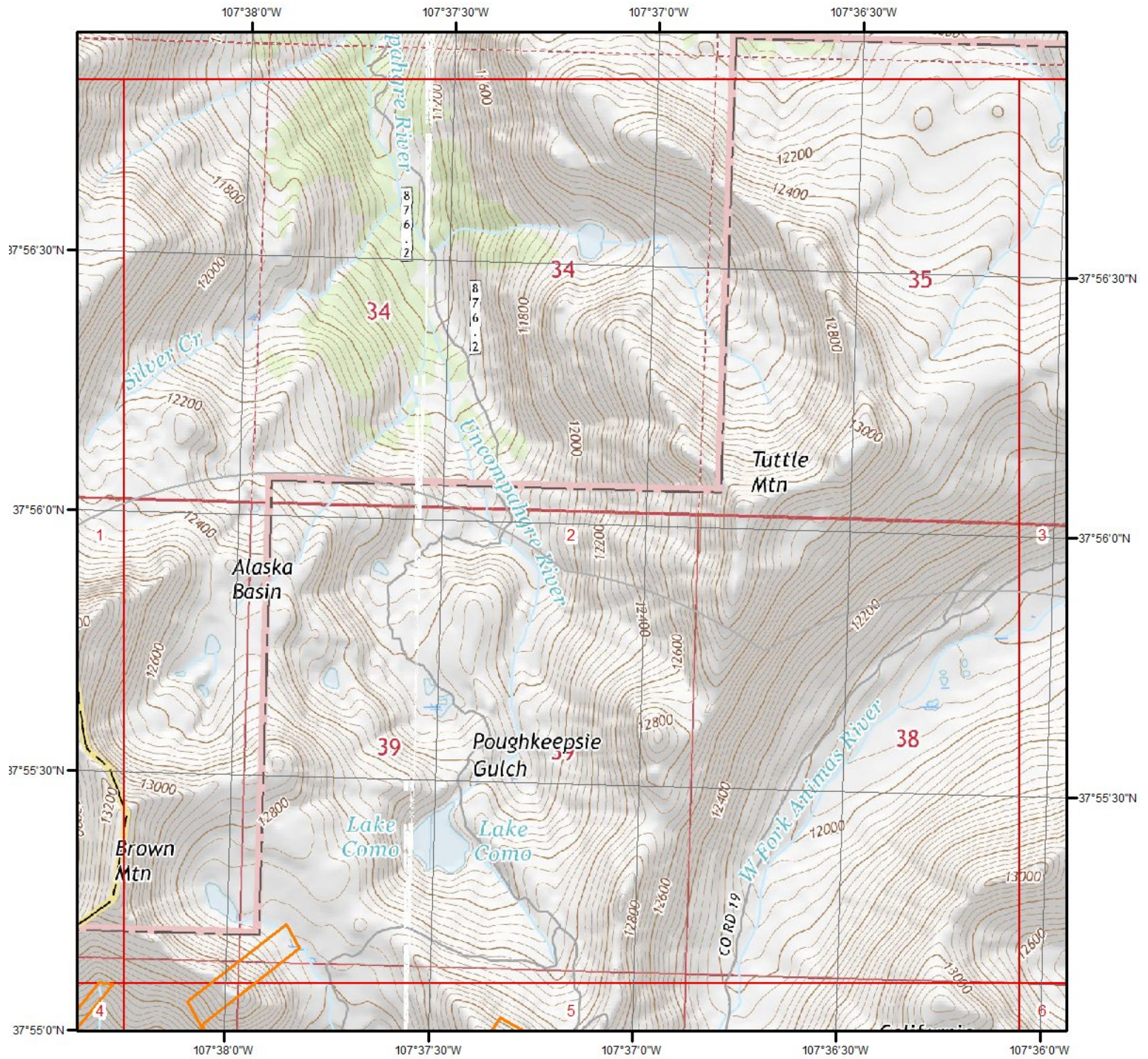
Quadrangle(s): Ironton, CO

Source: USGS 7.5 Minute Topographic Map





## Topographic Information



**Current USGS Topo - Page 2**

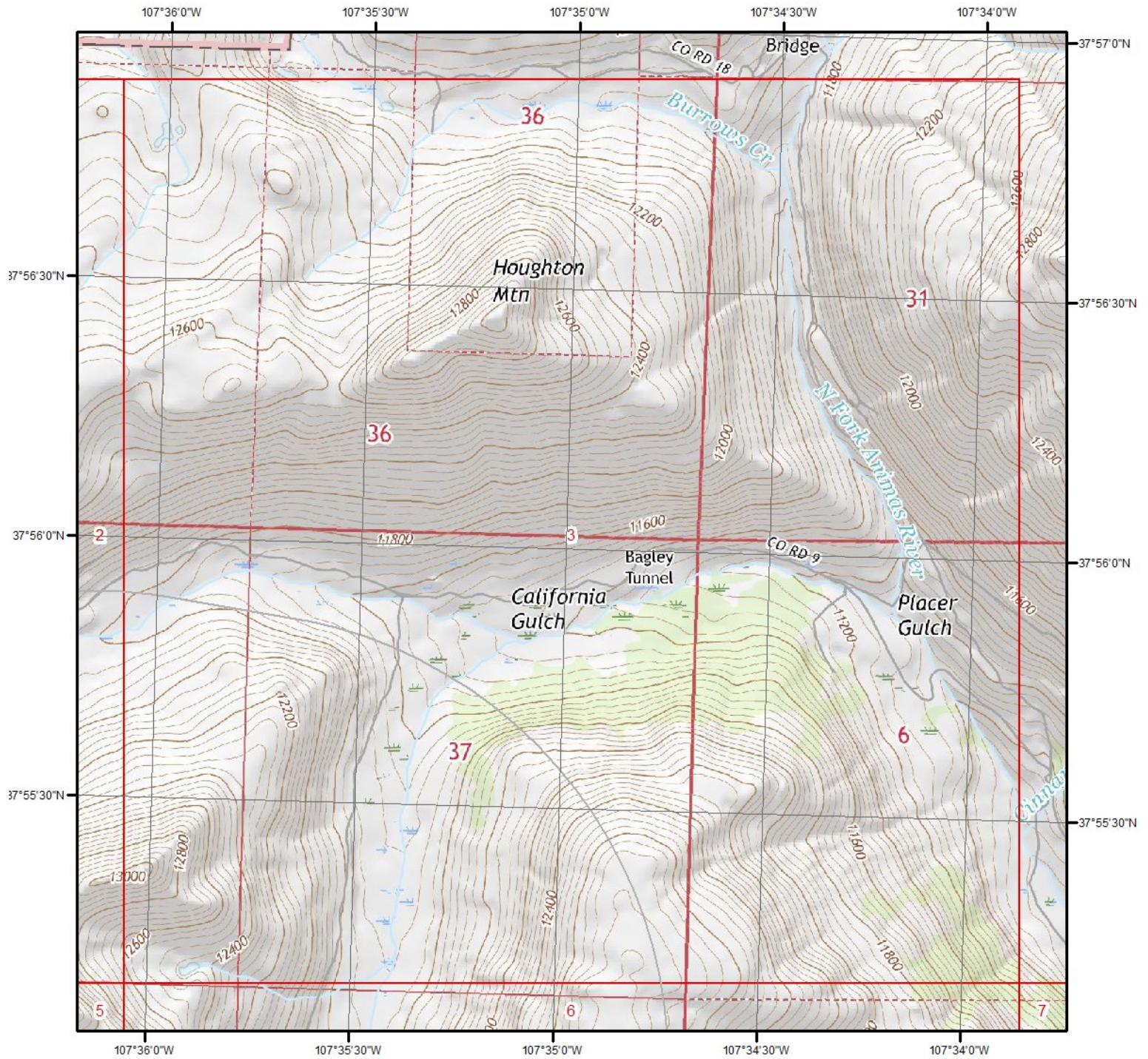
**Quadrangle(s): Handies Peak,CO; Iron Mountain,CO**

Source: USGS 7.5 Minute Topographic Map

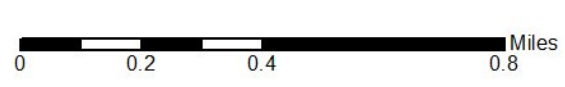




## Topographic Information



**Current USGS Topo - Page 3**



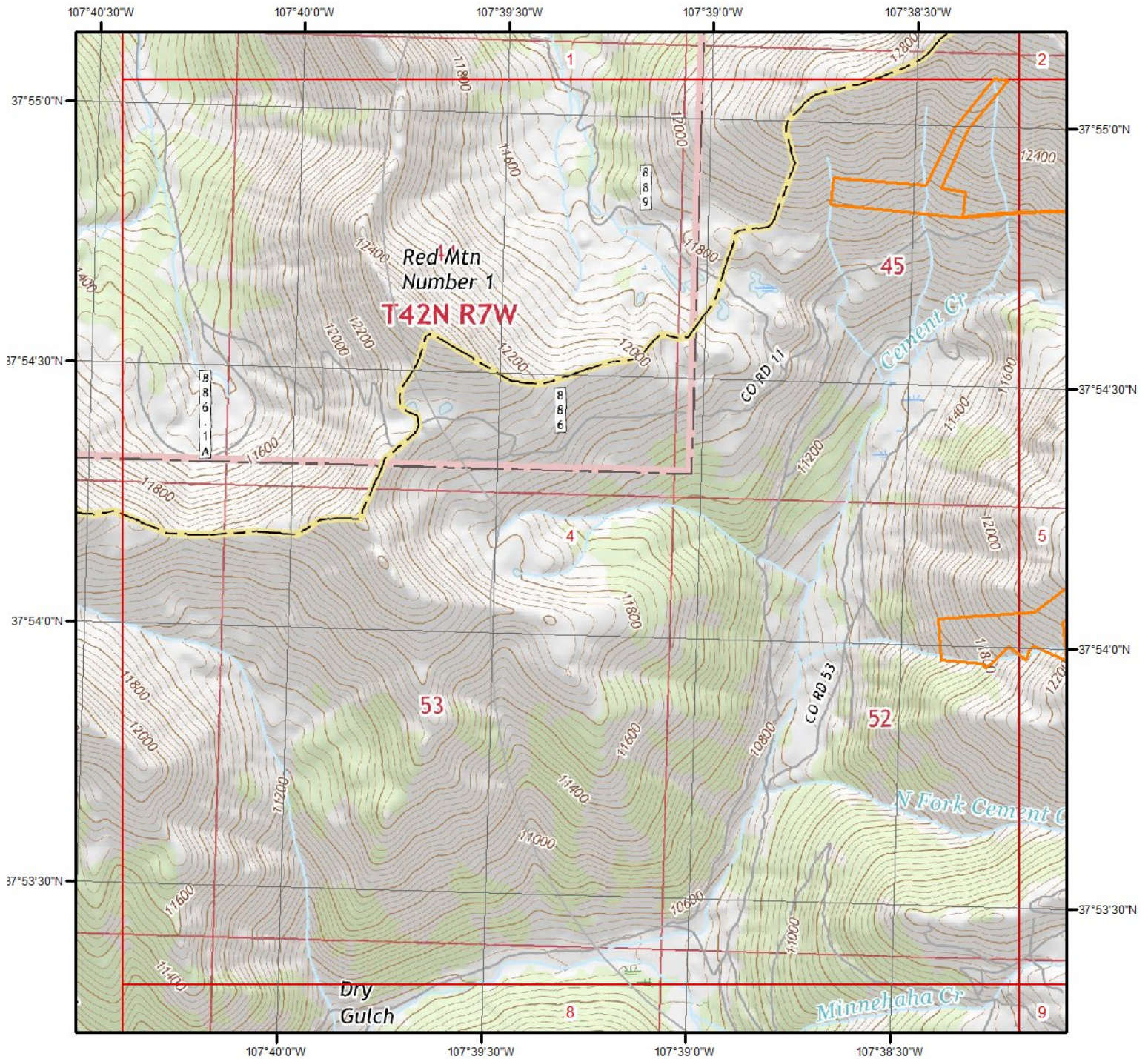
**Quadrangle(s): Handies Peak, CO**

Source: USGS 7.5 Minute Topographic Map

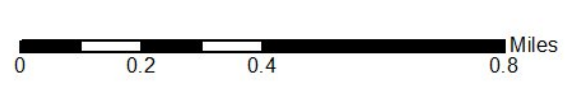




## Topographic Information



**Current USGS Topo - Page 4**



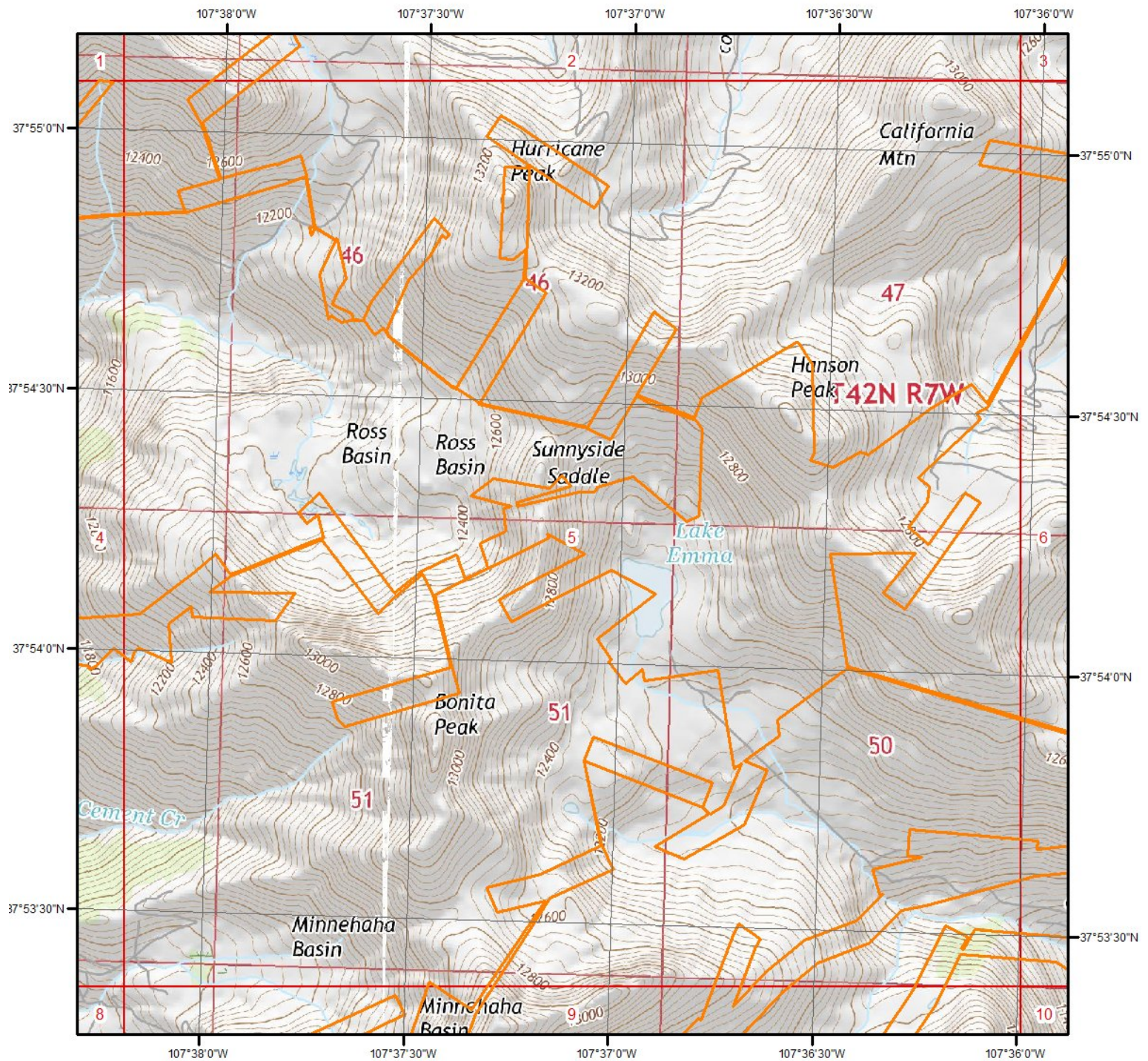
**Quadrangle(s): Ironton, CO**

Source: USGS 7.5 Minute Topographic Map

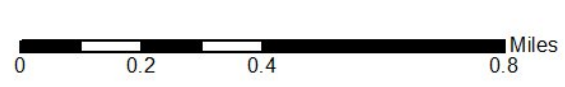




## Topographic Information



Current USGS Topo - Page 5



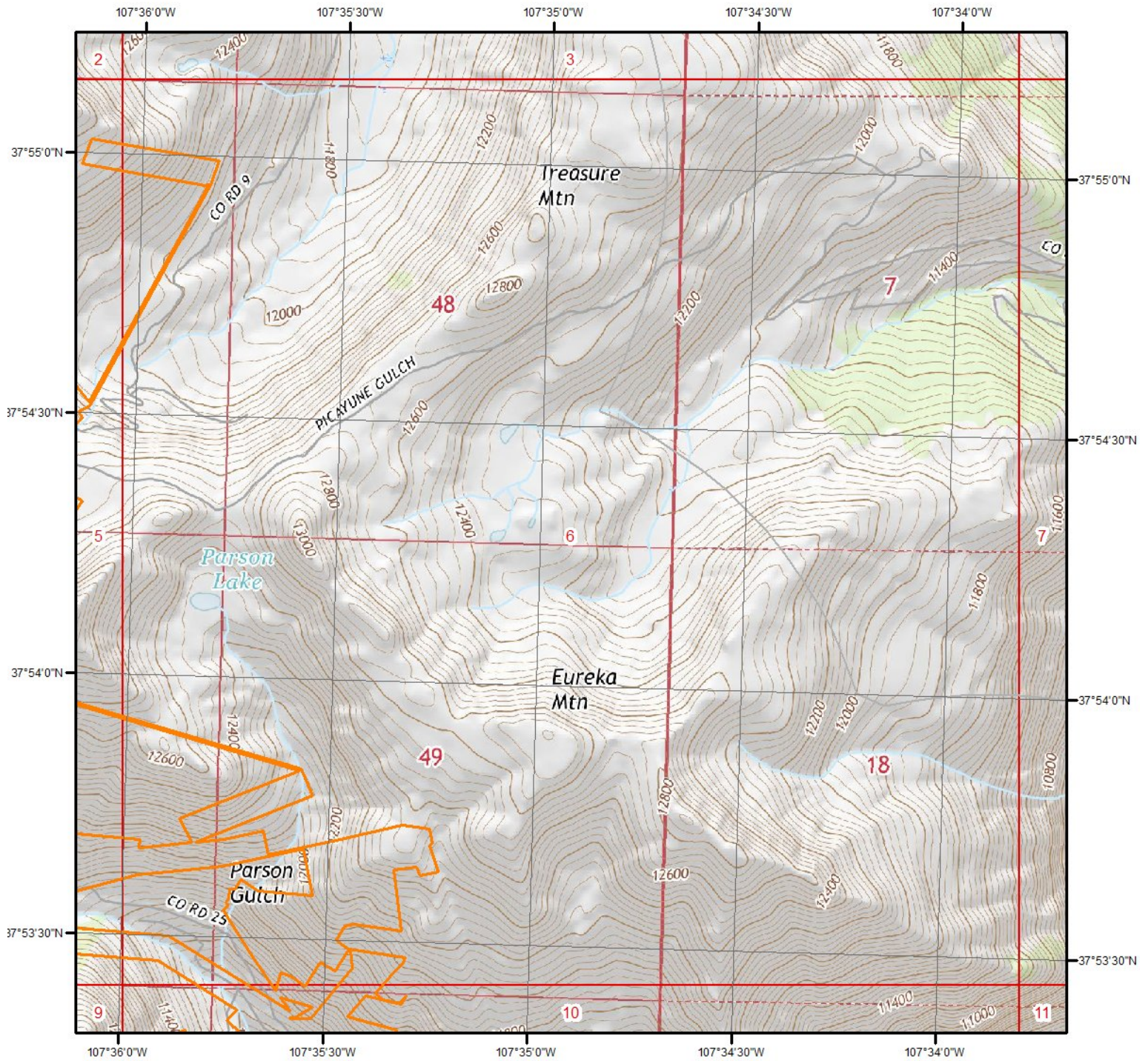
Quadrangle(s): Handies Peak,CO; Ironton,CO

Source: USGS 7.5 Minute Topographic Map

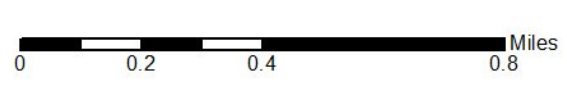




## Topographic Information



Current USGS Topo - Page 6



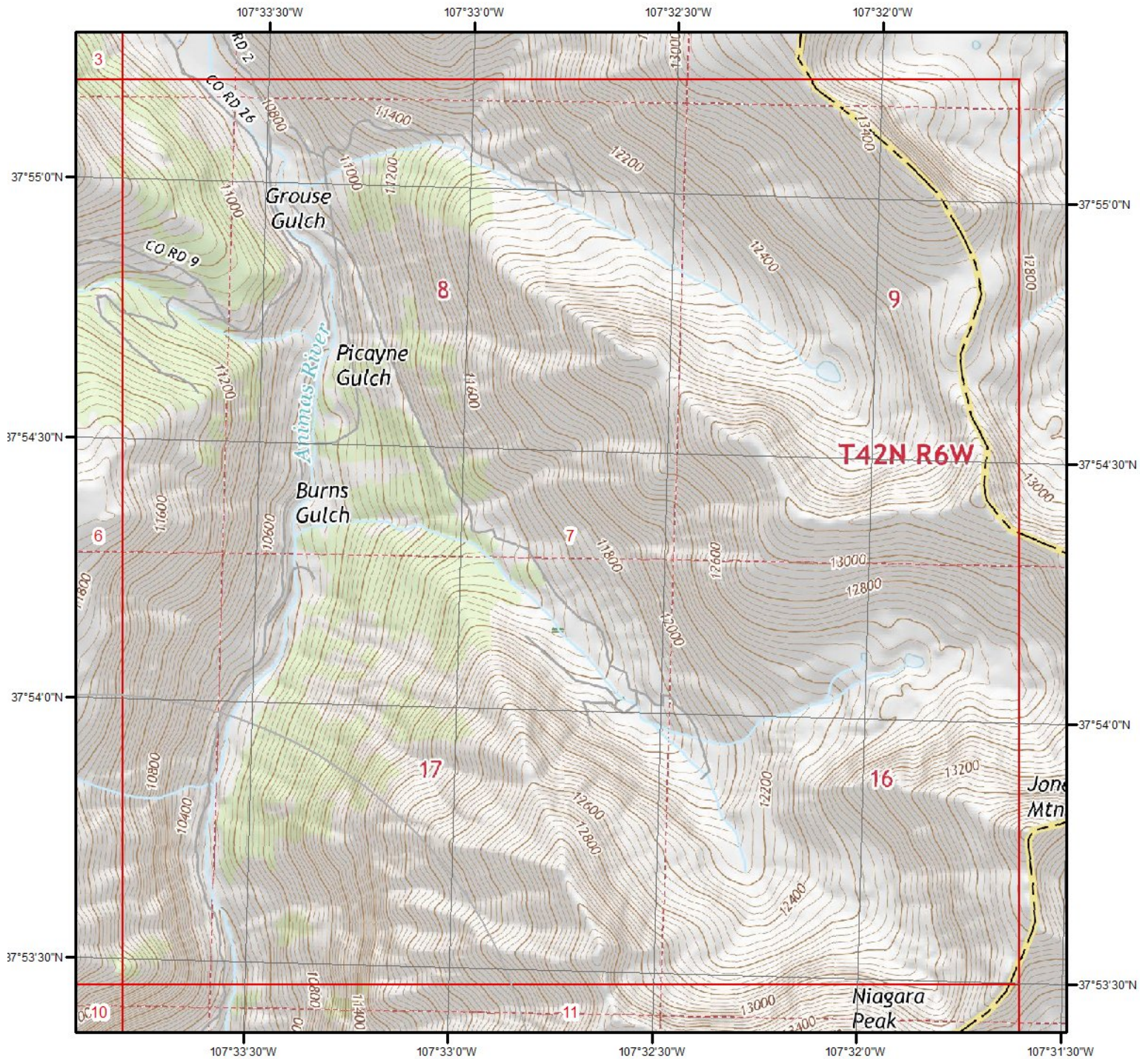
Quadrangle(s): Handies Peak, CO

Source: USGS 7.5 Minute Topographic Map

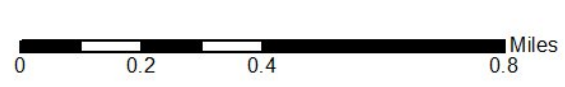




## Topographic Information



Current USGS Topo - Page 7



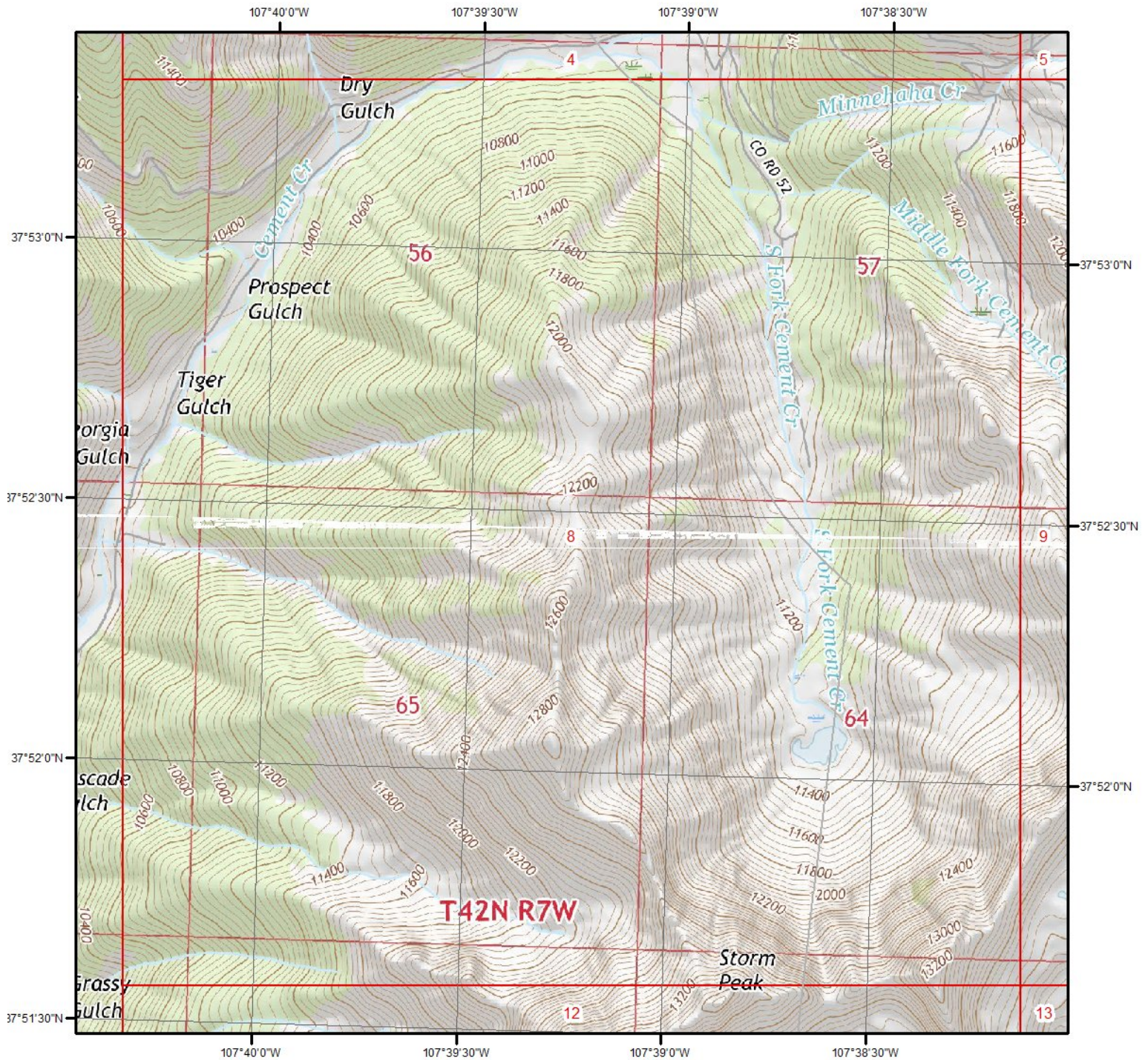
Quadrangle(s): Handies Peak, CO

Source: USGS 7.5 Minute Topographic Map

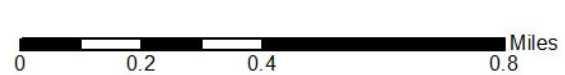




## Topographic Information



**Current USGS Topo - Page 8**



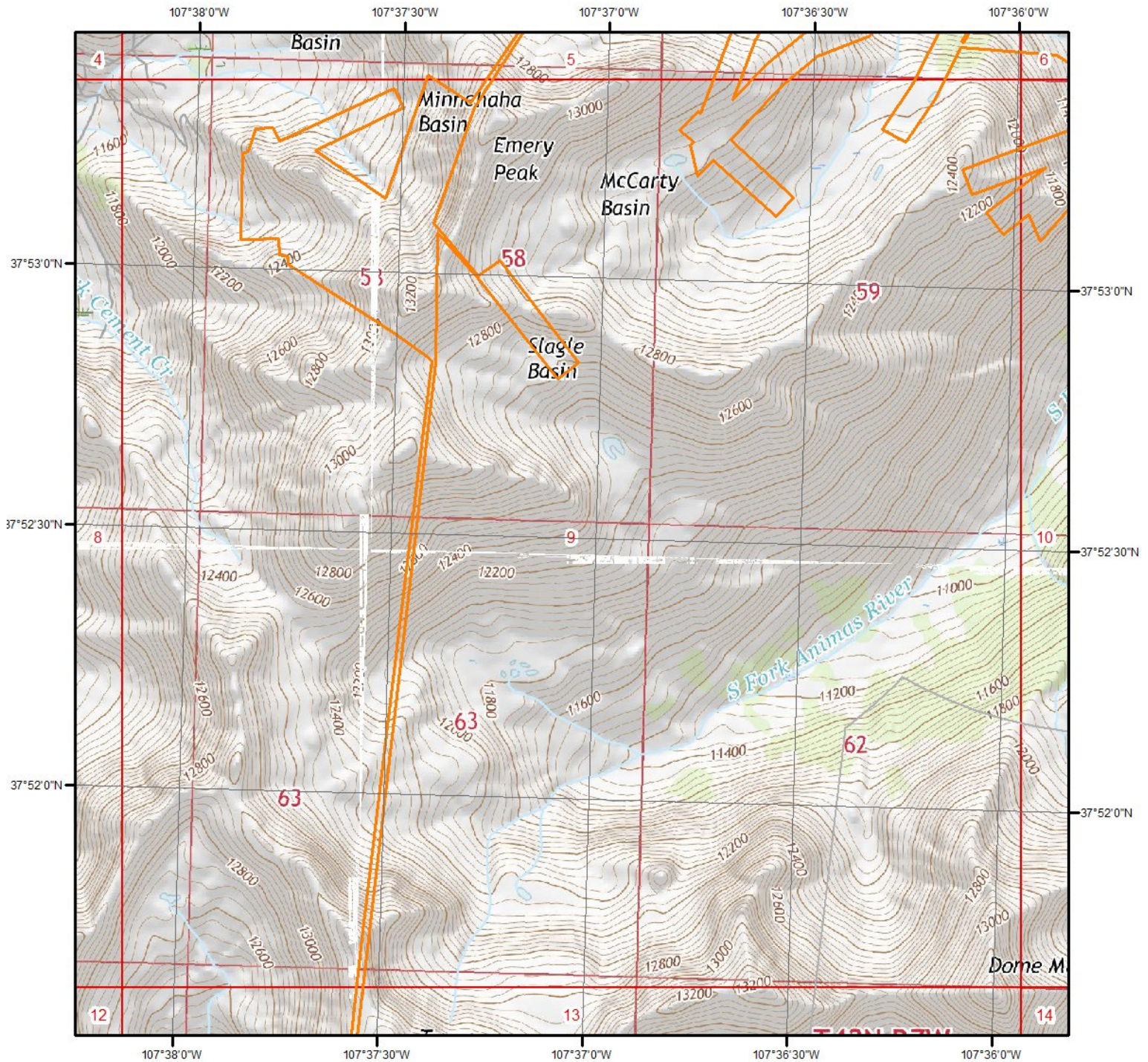
**Quadrangle(s): Ironton, CO; Silverton, CO**

Source: USGS 7.5 Minute Topographic Map

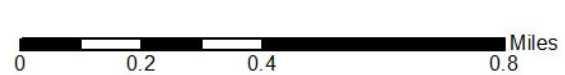




## Topographic Information



Current USGS Topo - Page 9



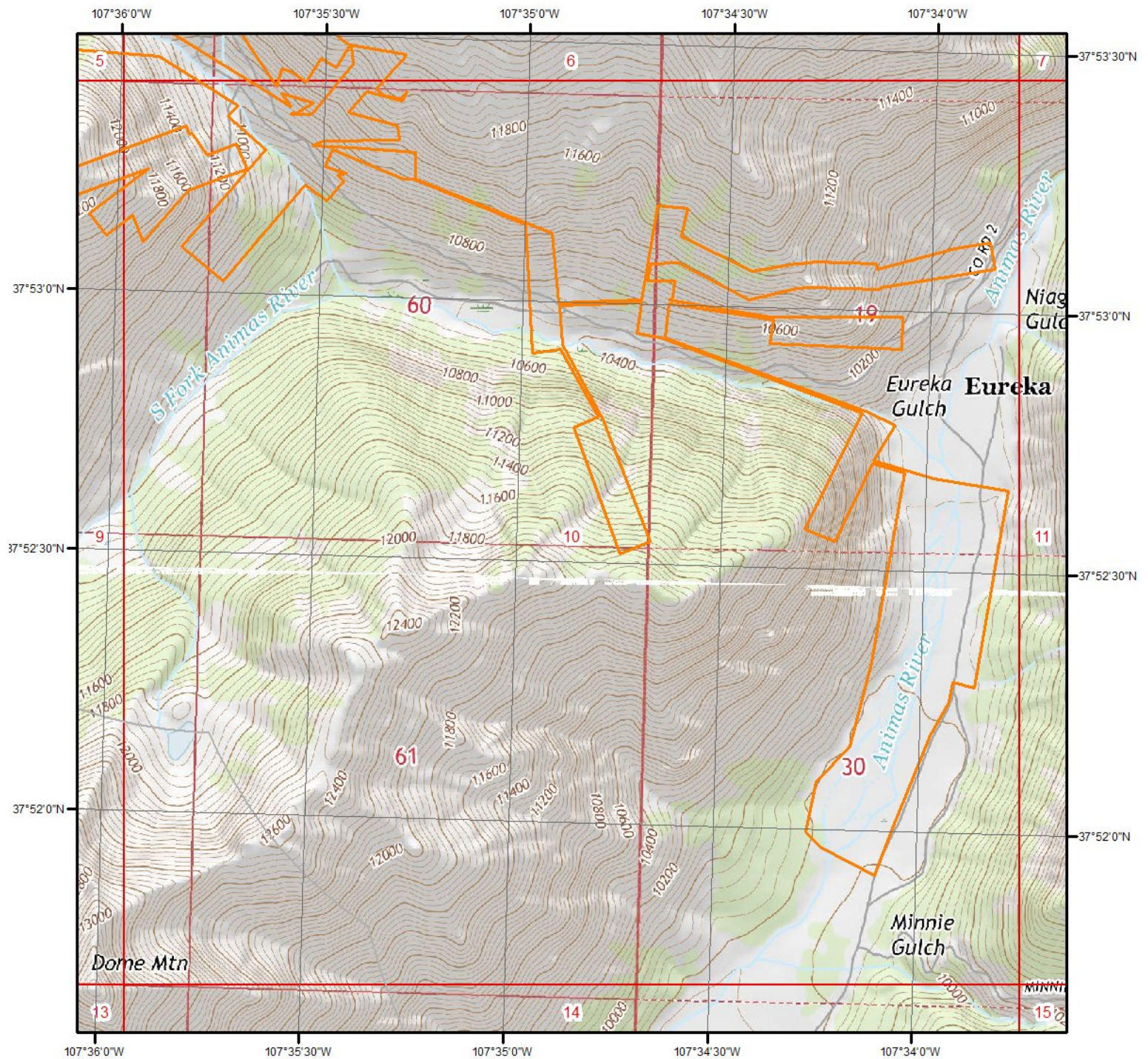
Quadrangle(s): Handies Peak,CO; Howardsville,CO; Ironton,CO; Silverton.CO



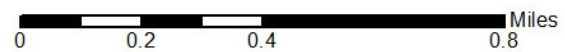
Source: USGS 7.5 Minute Topographic Map



## Topographic Information



**Current USGS Topo - Page 10**



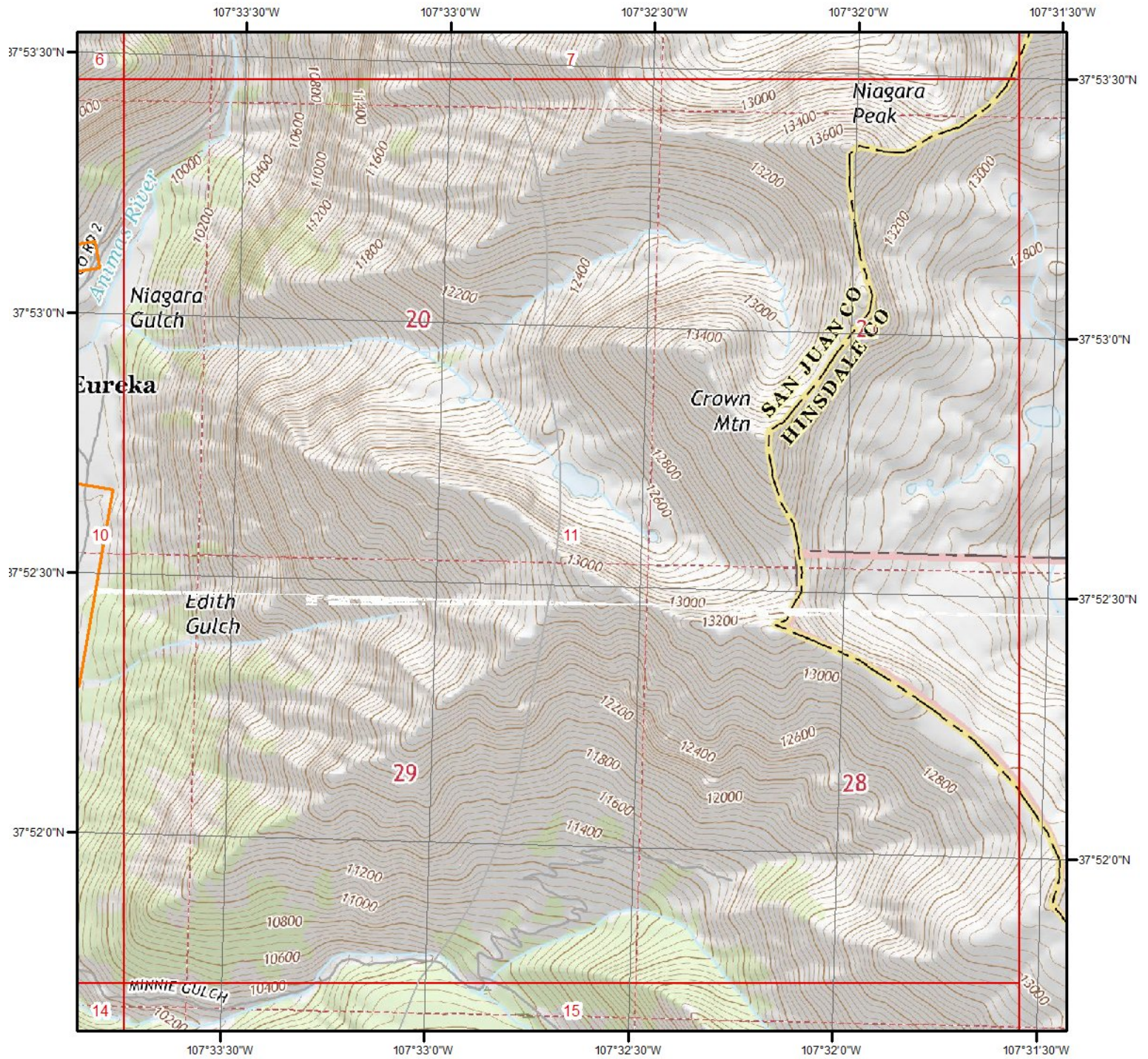
**Quadrangle(s): Handies Peak,CO; Howardsville,CO**

Source: USGS 7.5 Minute Topographic Map

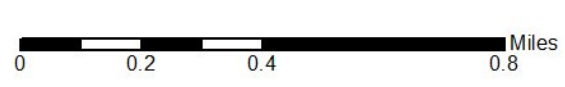




## Topographic Information



**Current USGS Topo - Page 11**



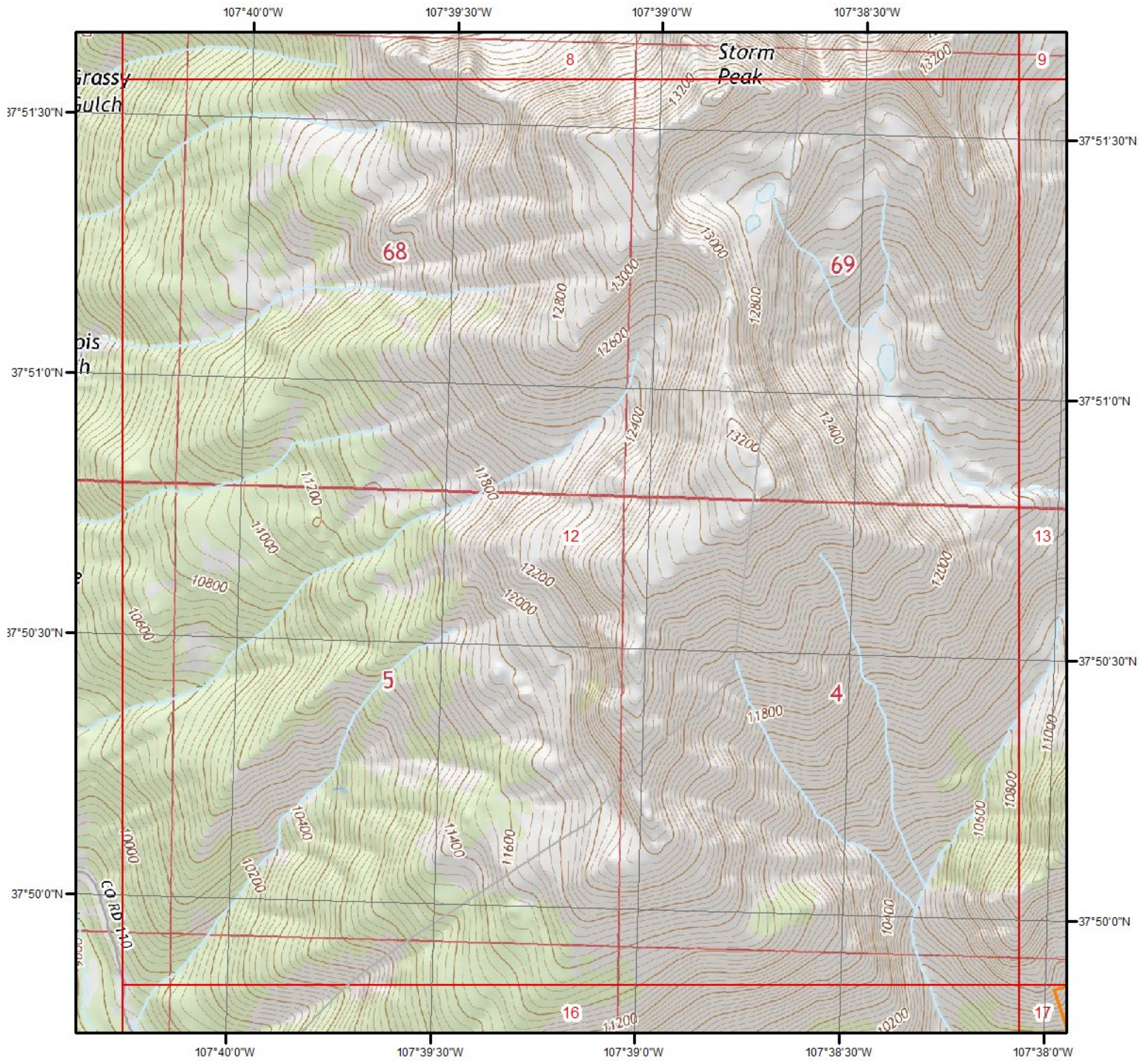
**Quadrangle(s): Handies Peak,CO; Howardsville,CO**

Source: USGS 7.5 Minute Topographic Map

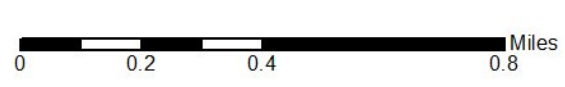




## Topographic Information



**Current USGS Topo - Page 12**



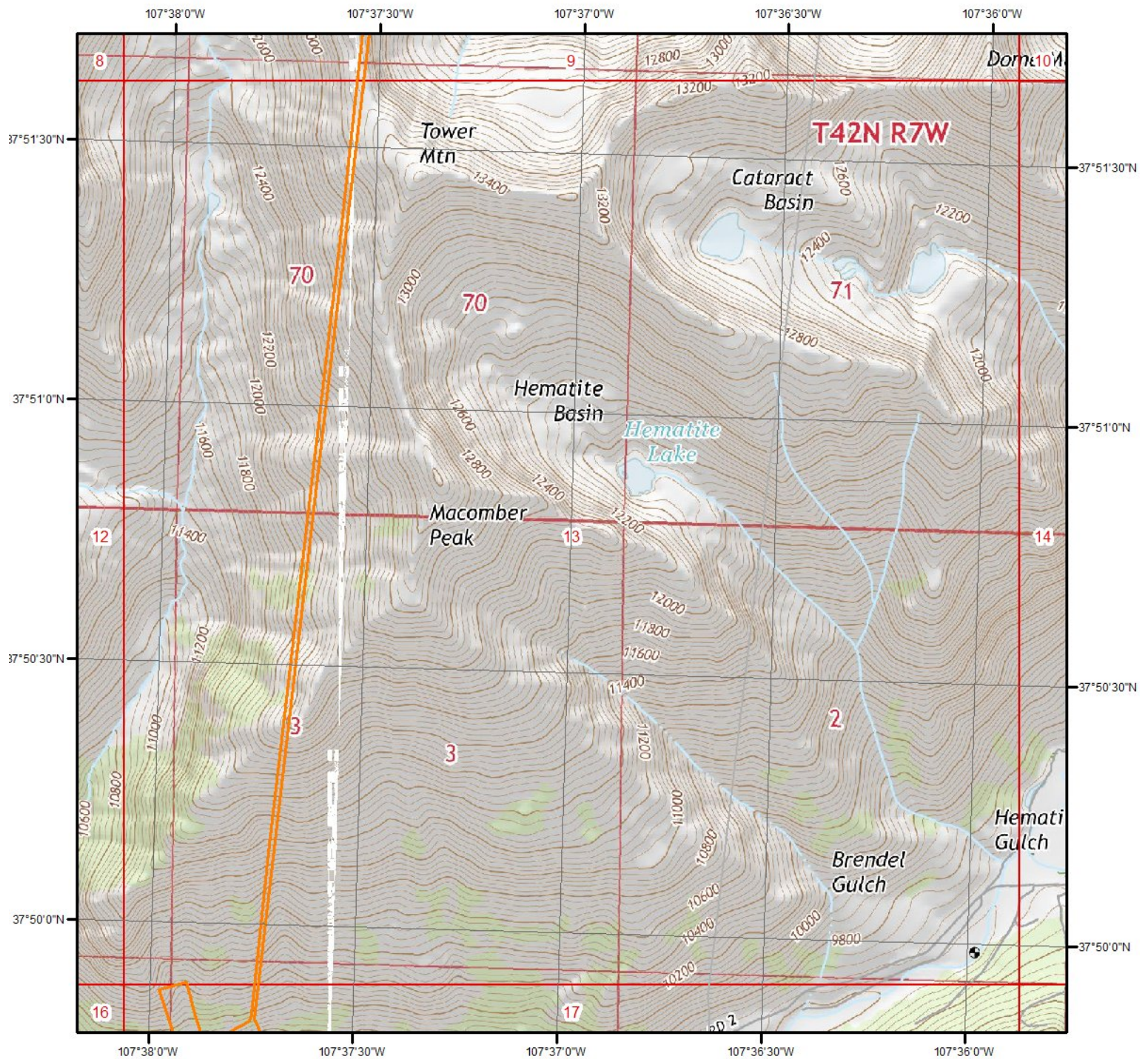
**Quadrangle(s): Silverton, CO**

Source: USGS 7.5 Minute Topographic Map

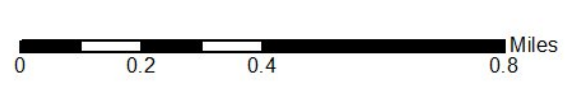




## Topographic Information



**Current USGS Topo - Page 13**



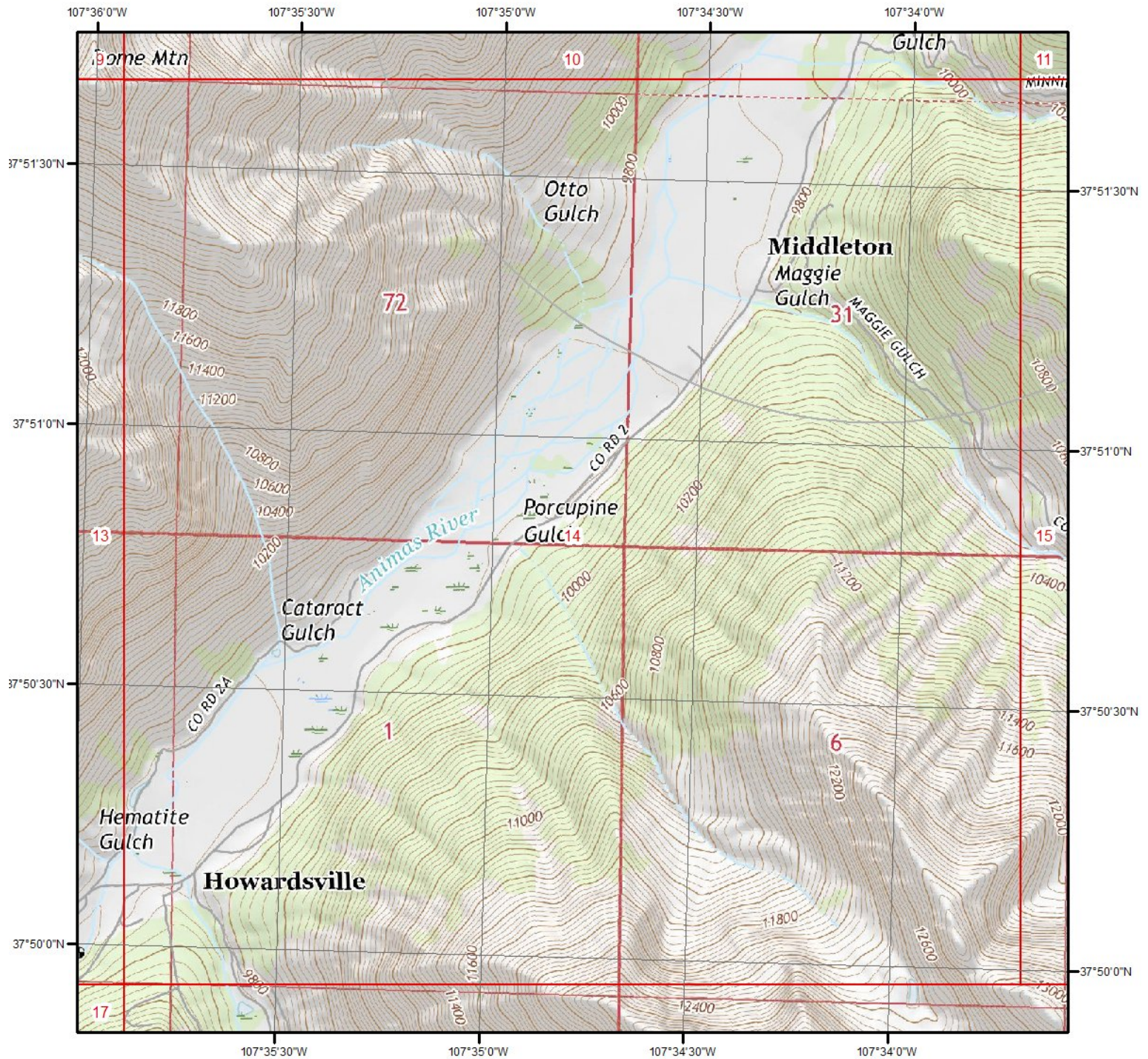
**Quadrangle(s): Howardville, CO; Silverton, CO**

Source: USGS 7.5 Minute Topographic Map

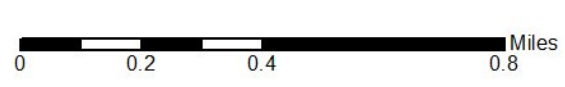




## Topographic Information



Current USGS Topo - Page 14



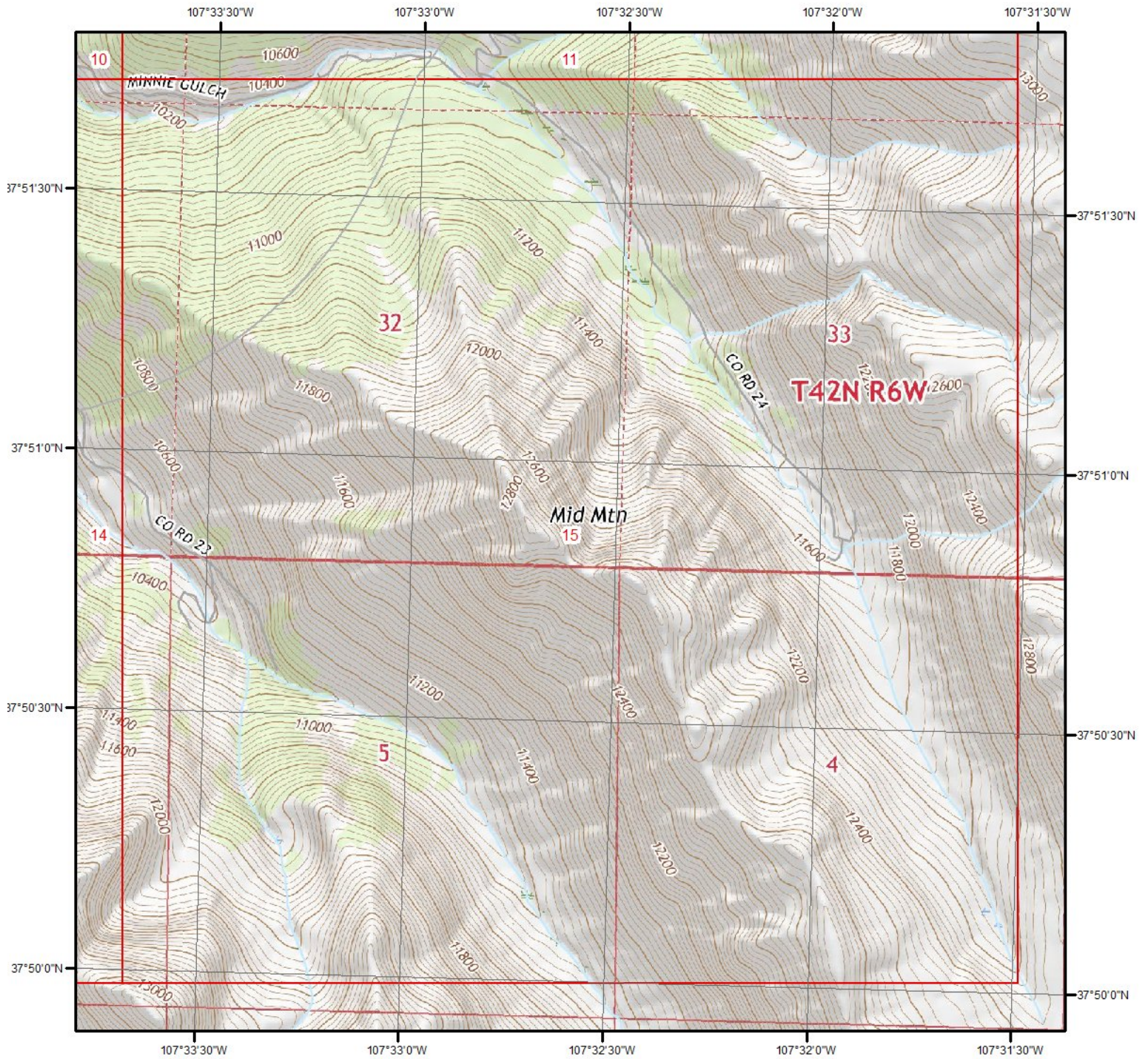
Quadrangle(s): Howardsville, CO

Source: USGS 7.5 Minute Topographic Map

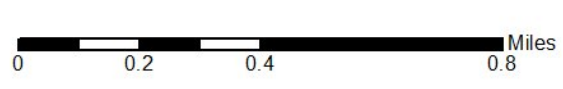




# Topographic Information



Current USGS Topo - Page 15



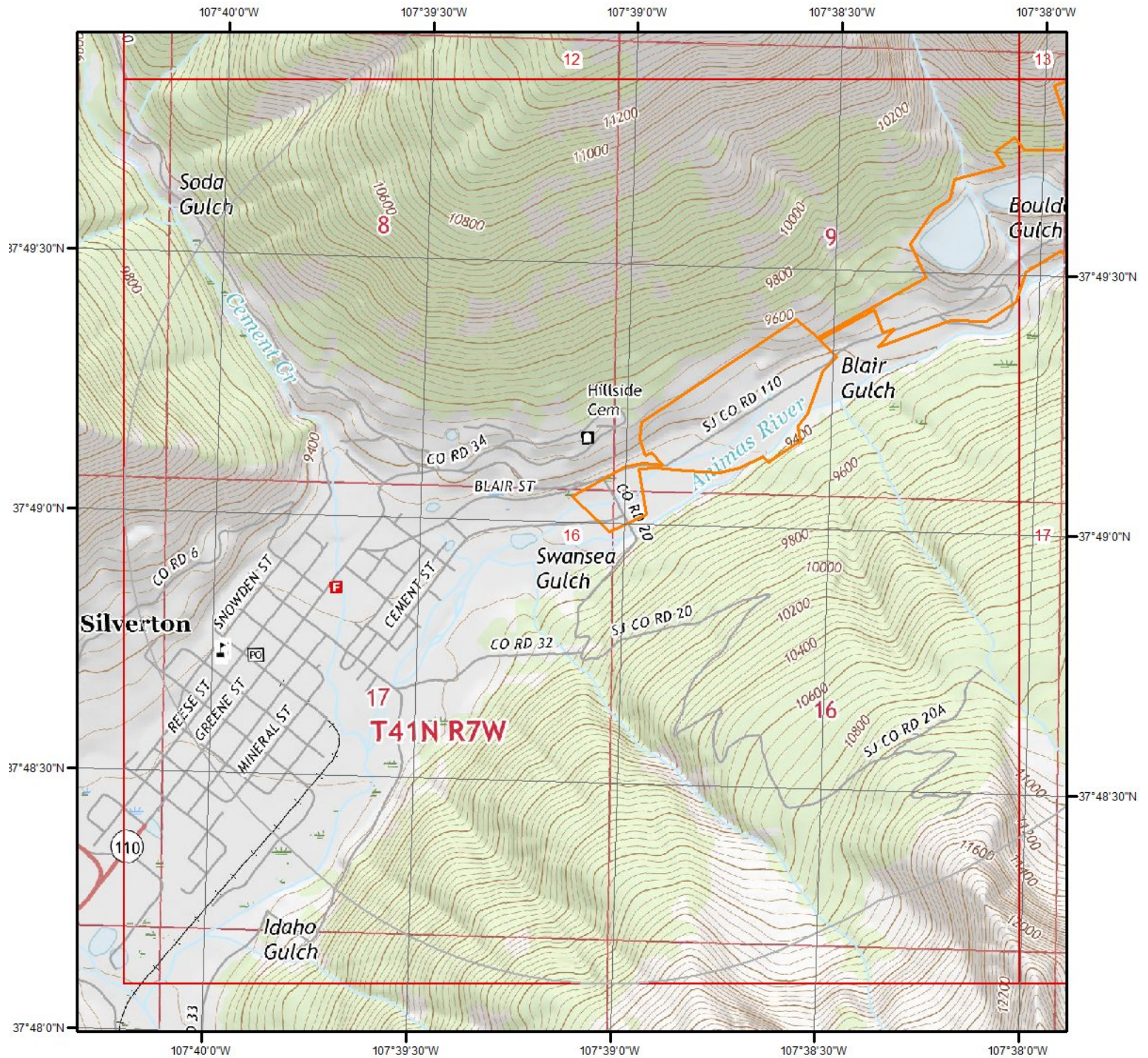
Quadrangle(s): Howardsville, CO

Source: USGS 7.5 Minute Topographic Map





## Topographic Information



Current USGS Topo - Page 16

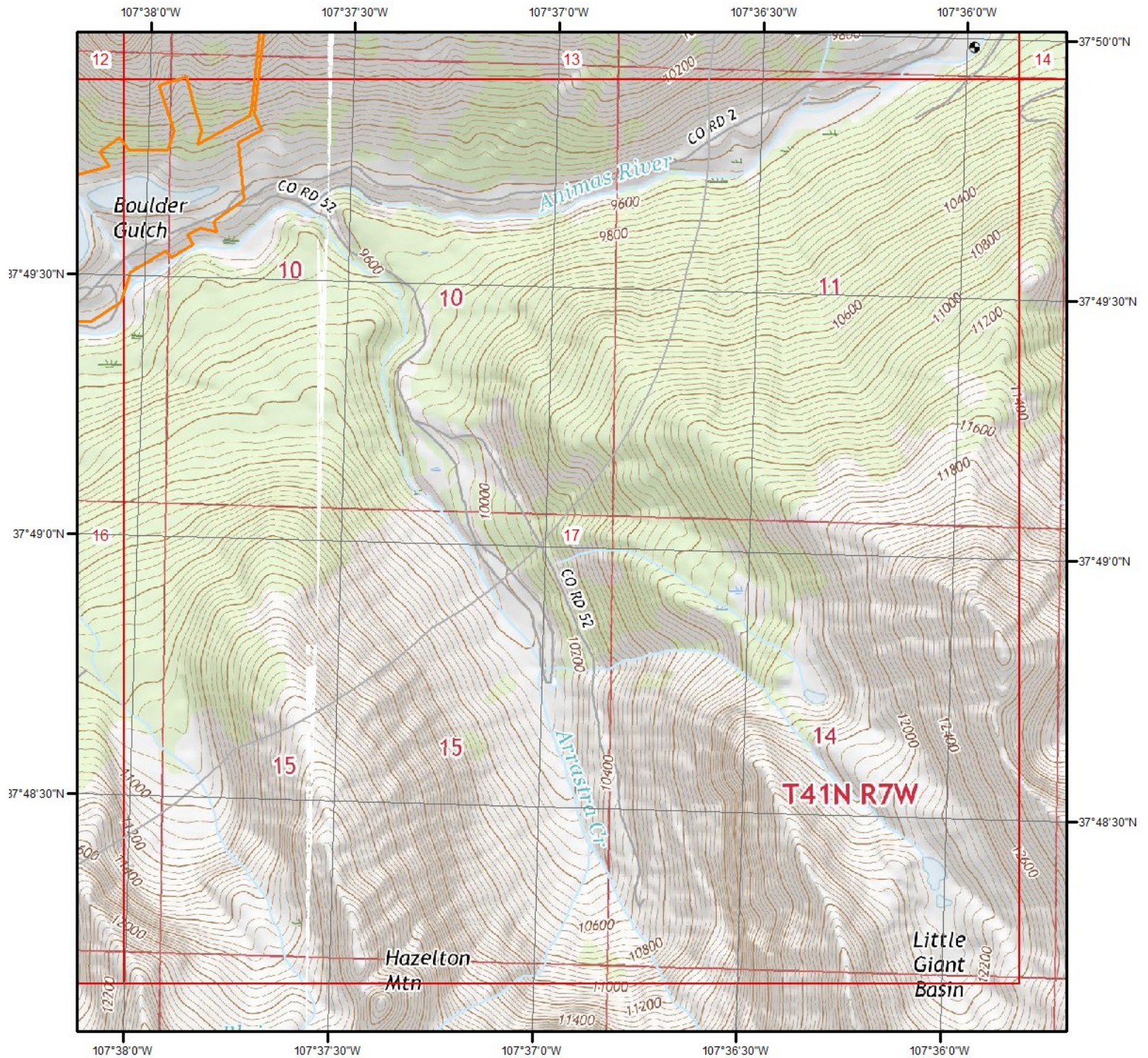
Quadrangle(s): Silverton, CO

Source: USGS 7.5 Minute Topographic Map

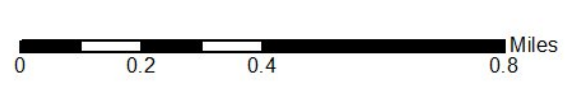




## Topographic Information



**Current USGS Topo - Page 17**



**Quadrangle(s): Howardville, CO; Silverton, CO**

Source: USGS 7.5 Minute Topographic Map



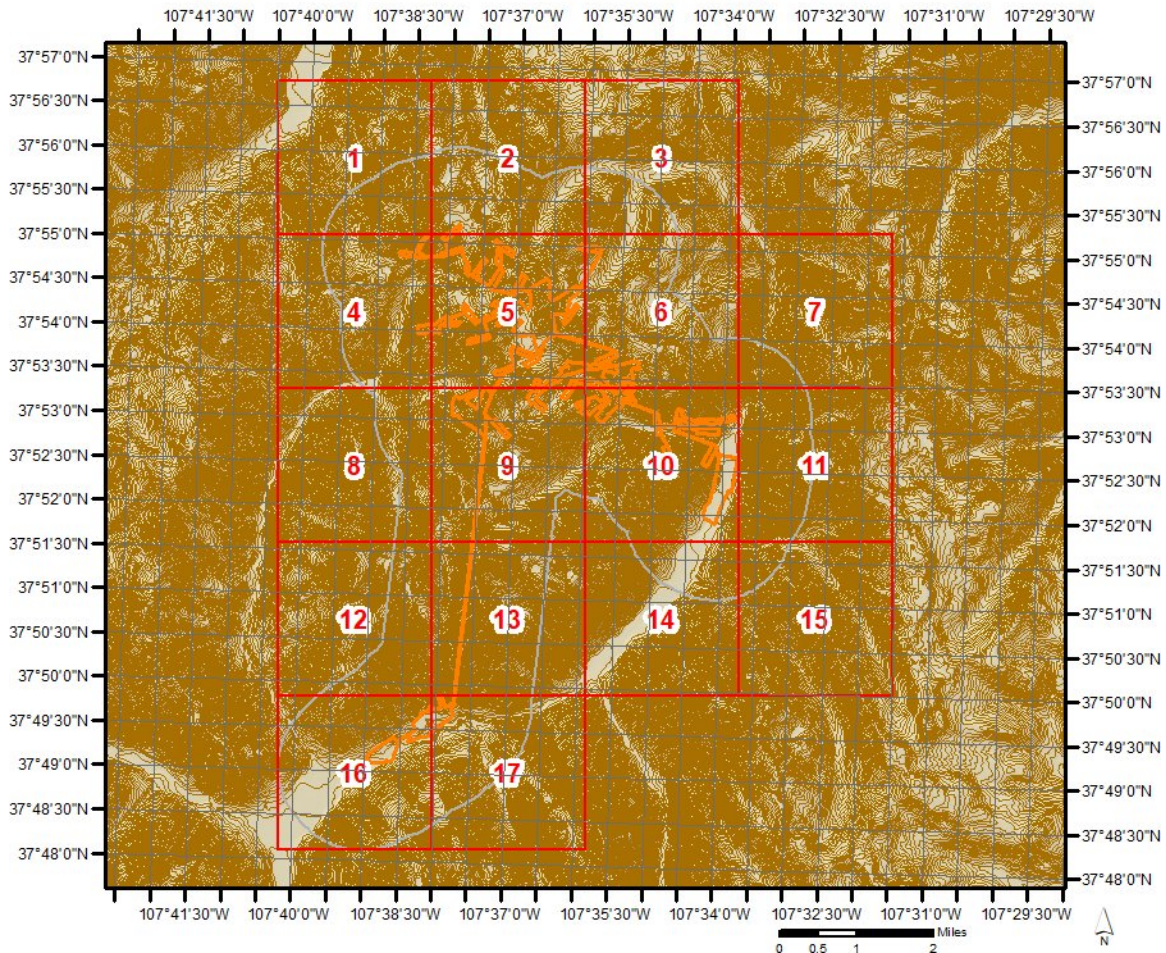


## Topographic Information

The previous topographic map(s) are created by seamlessly merging and cutting current USGS topographic data. Below are shaded relief map(s), derived from USGS elevation data to show surrounding topography in further detail.

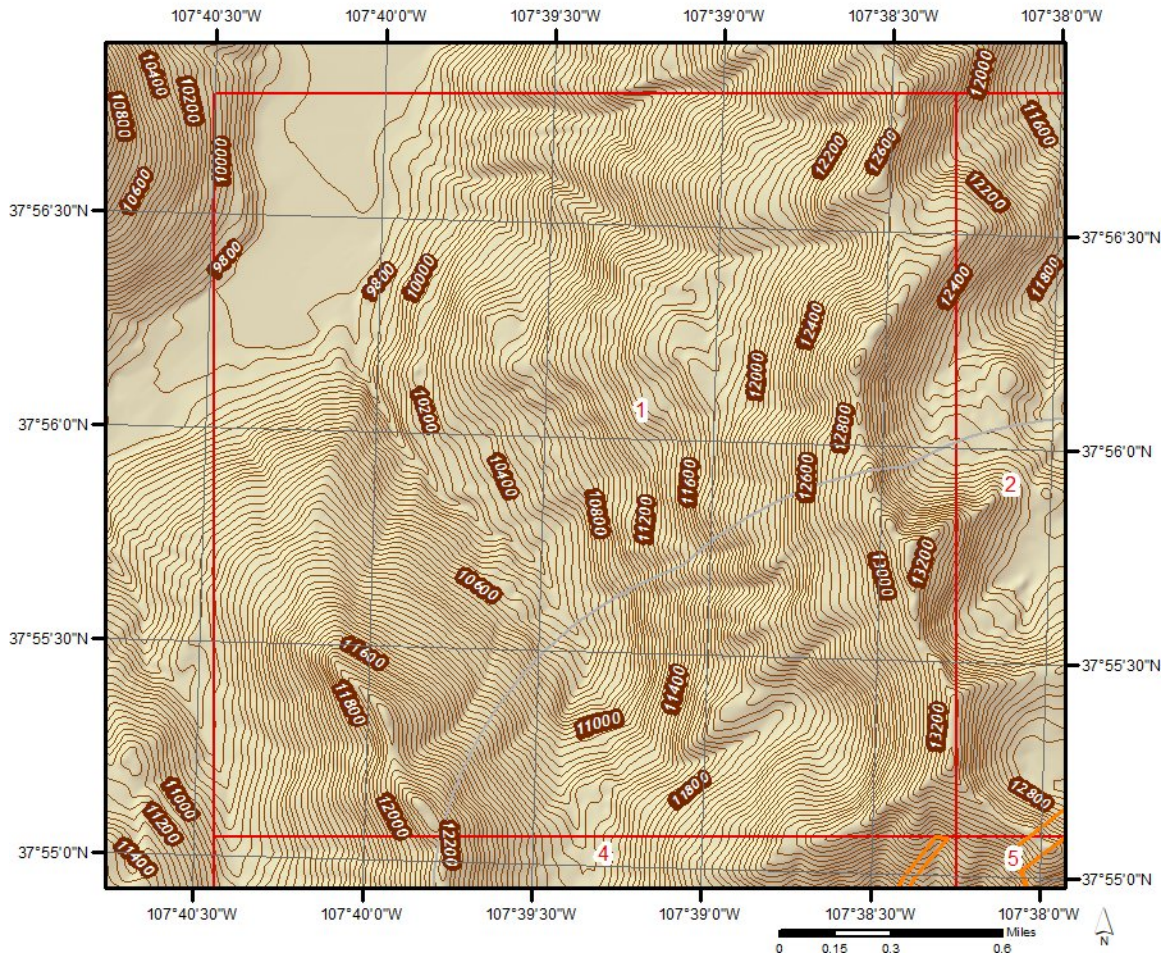
Topographic information at project property:

Elevation: 12,124.13 ft  
Slope Direction: SSE

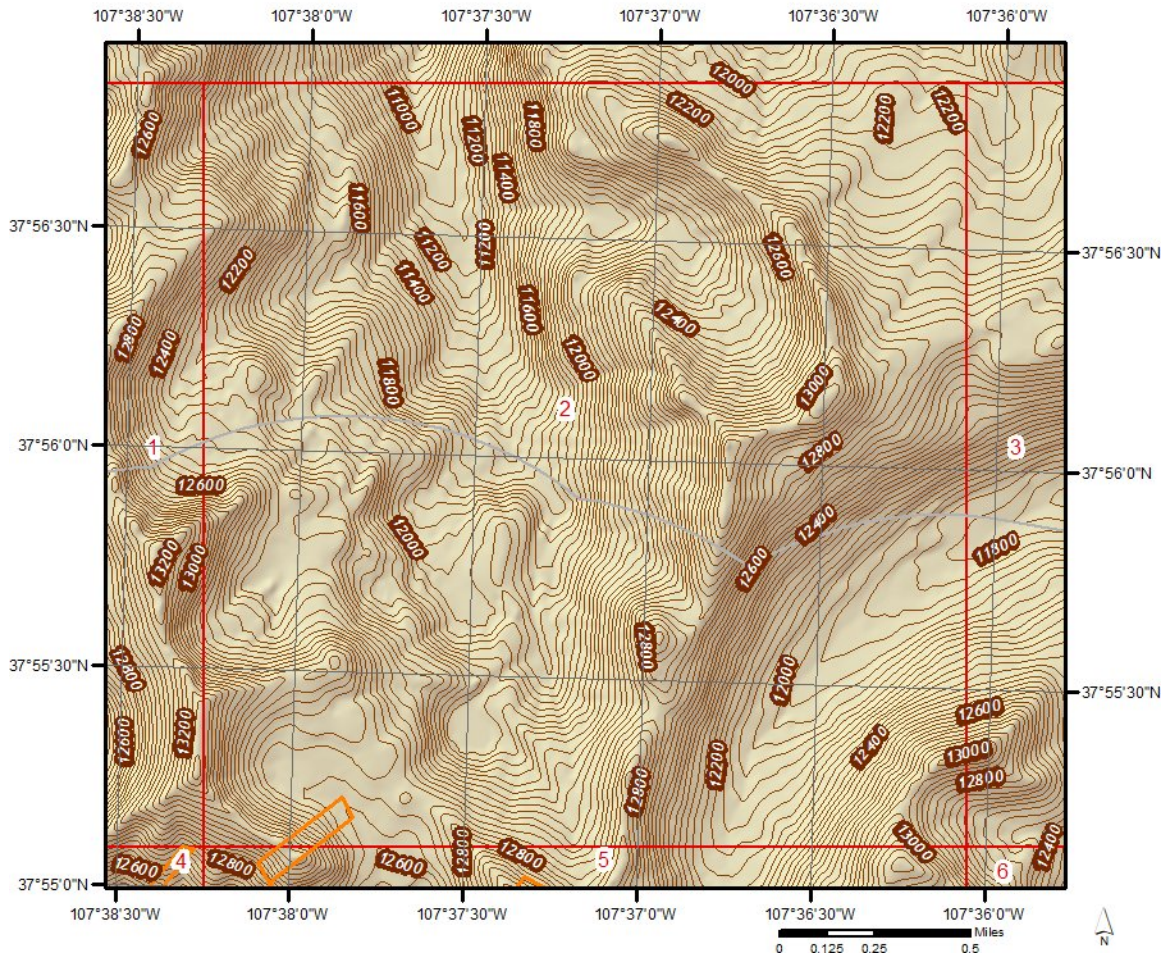




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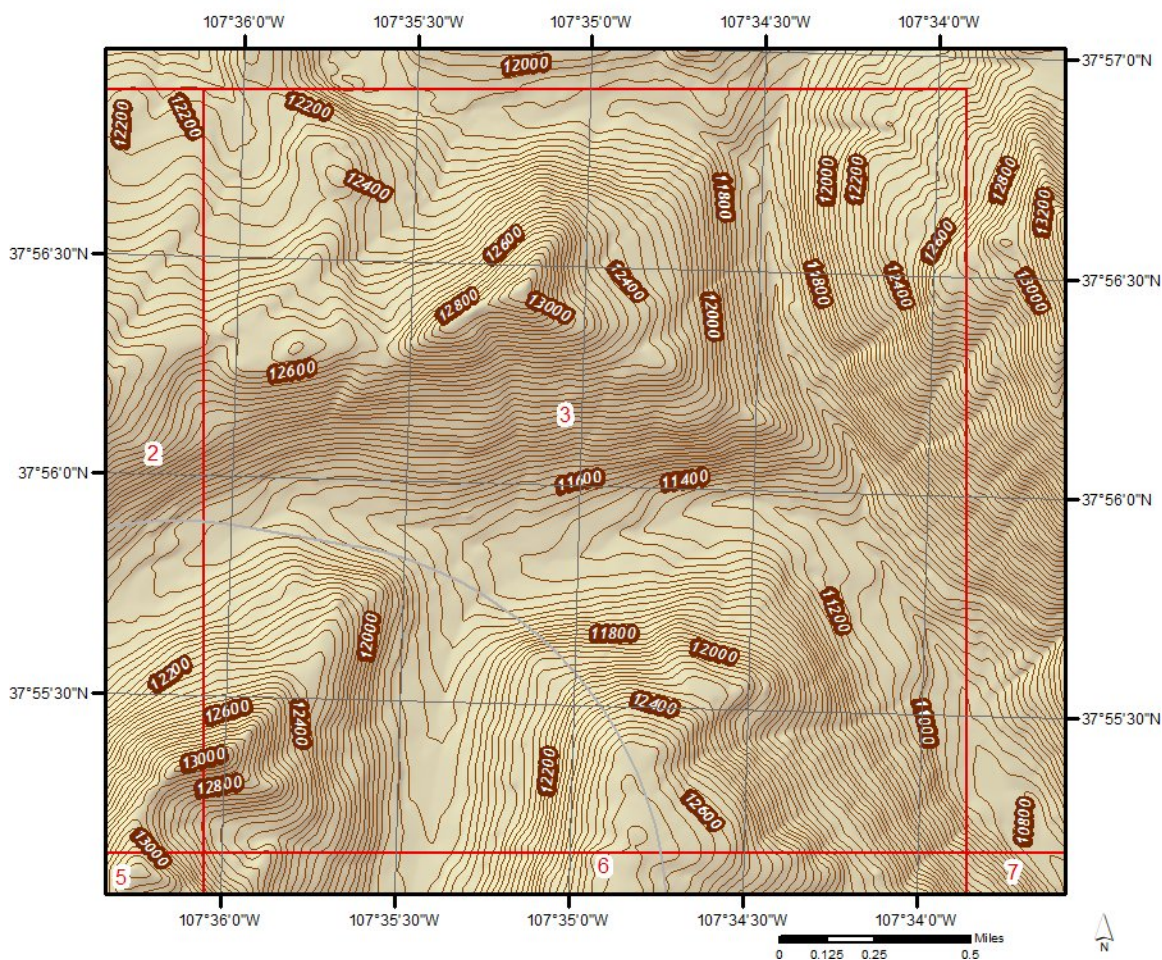


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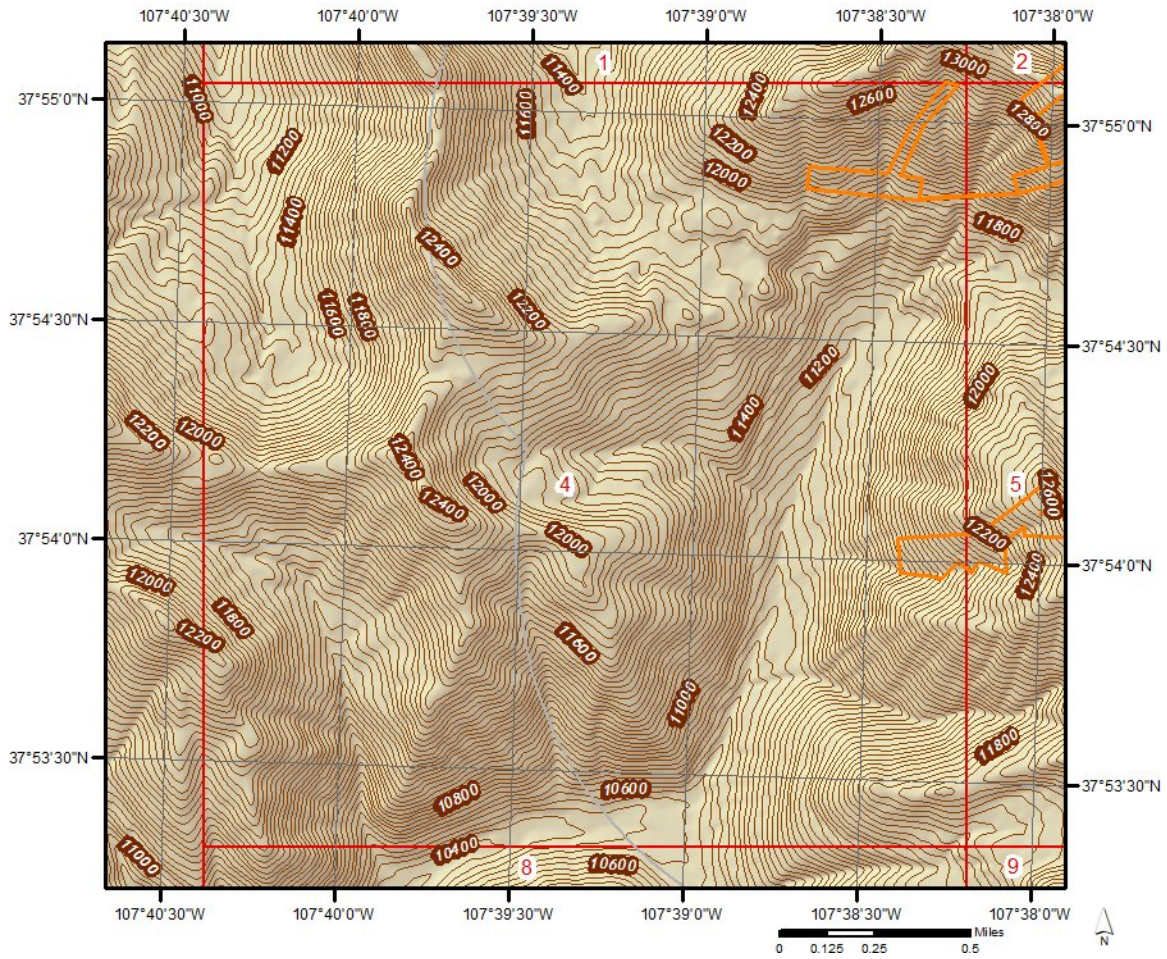




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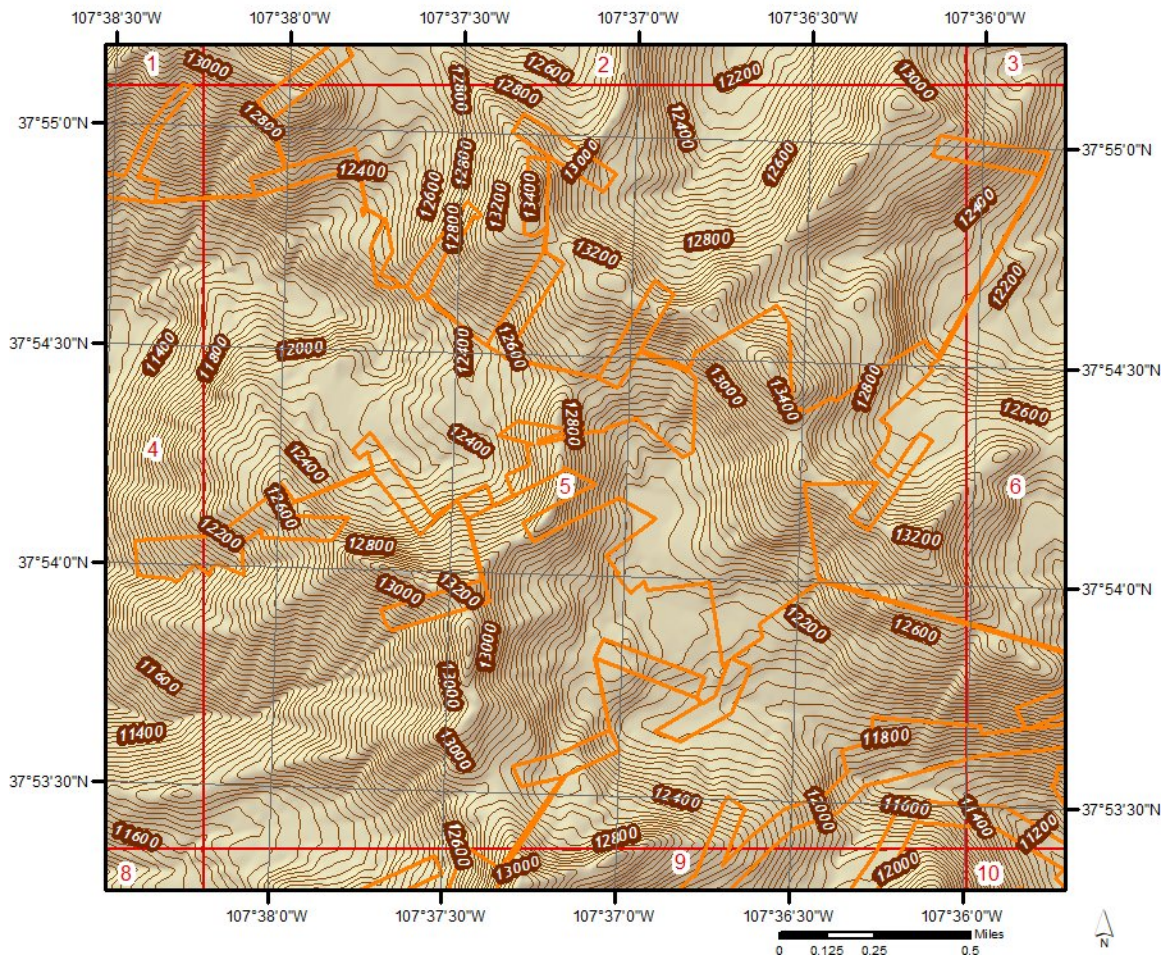


## Topographic Information



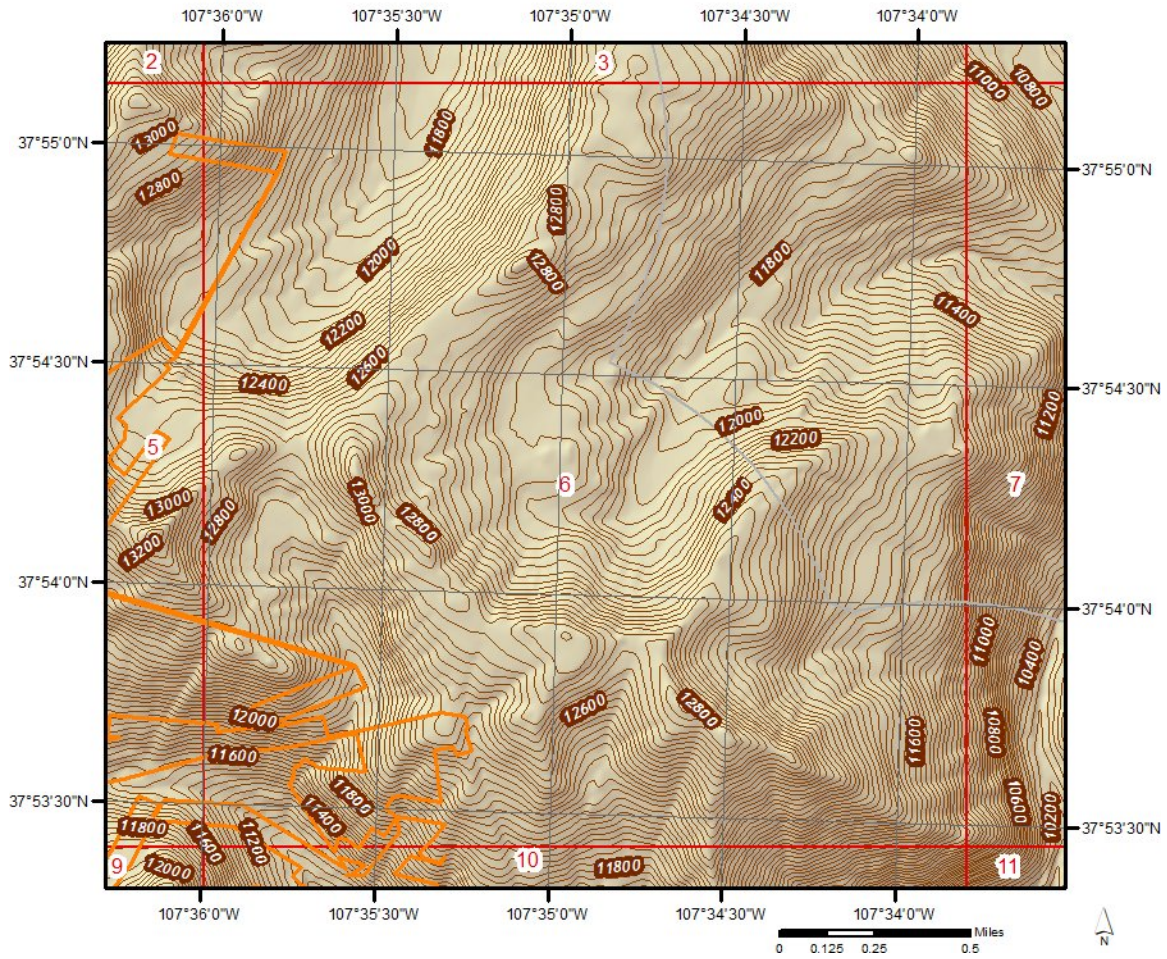


## Topographic Information

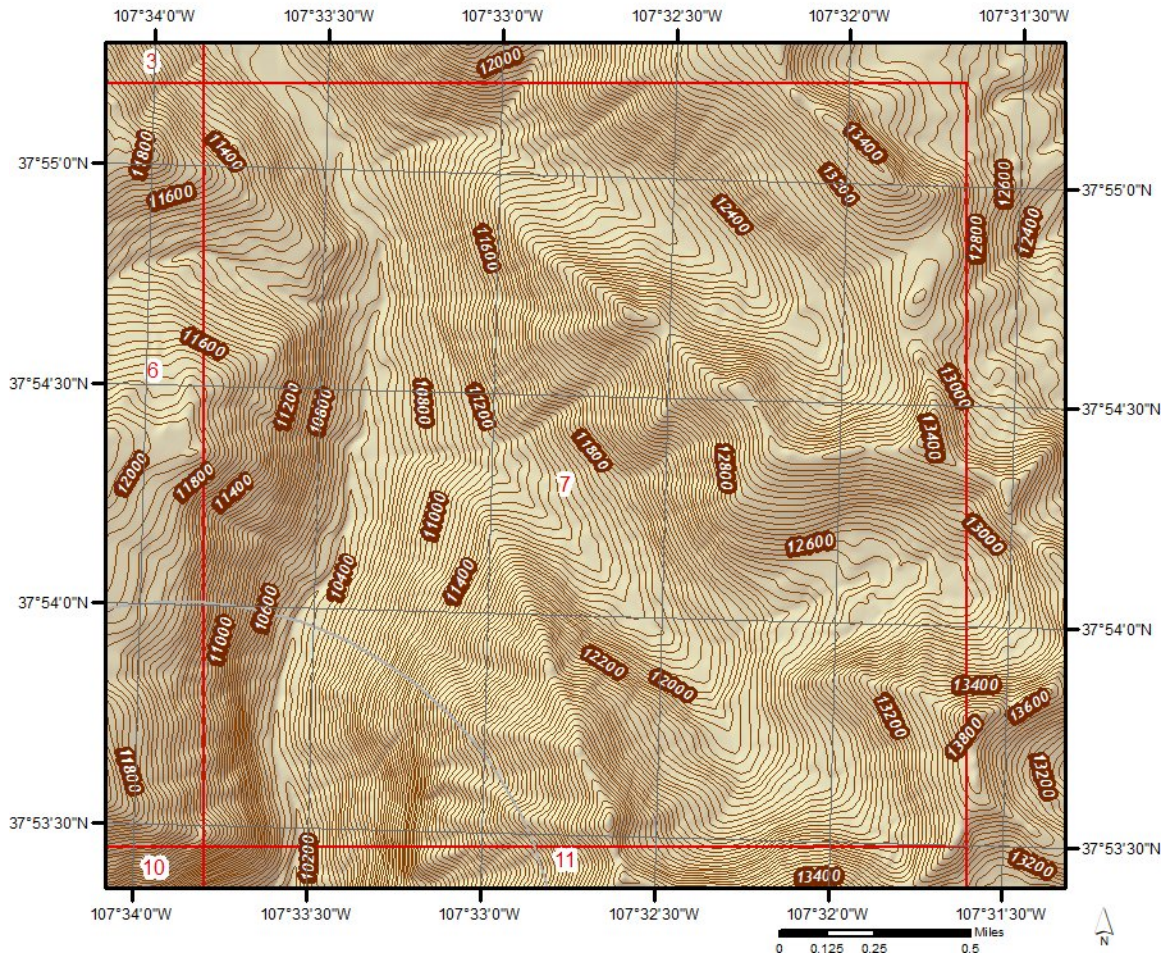




## Topographic Information

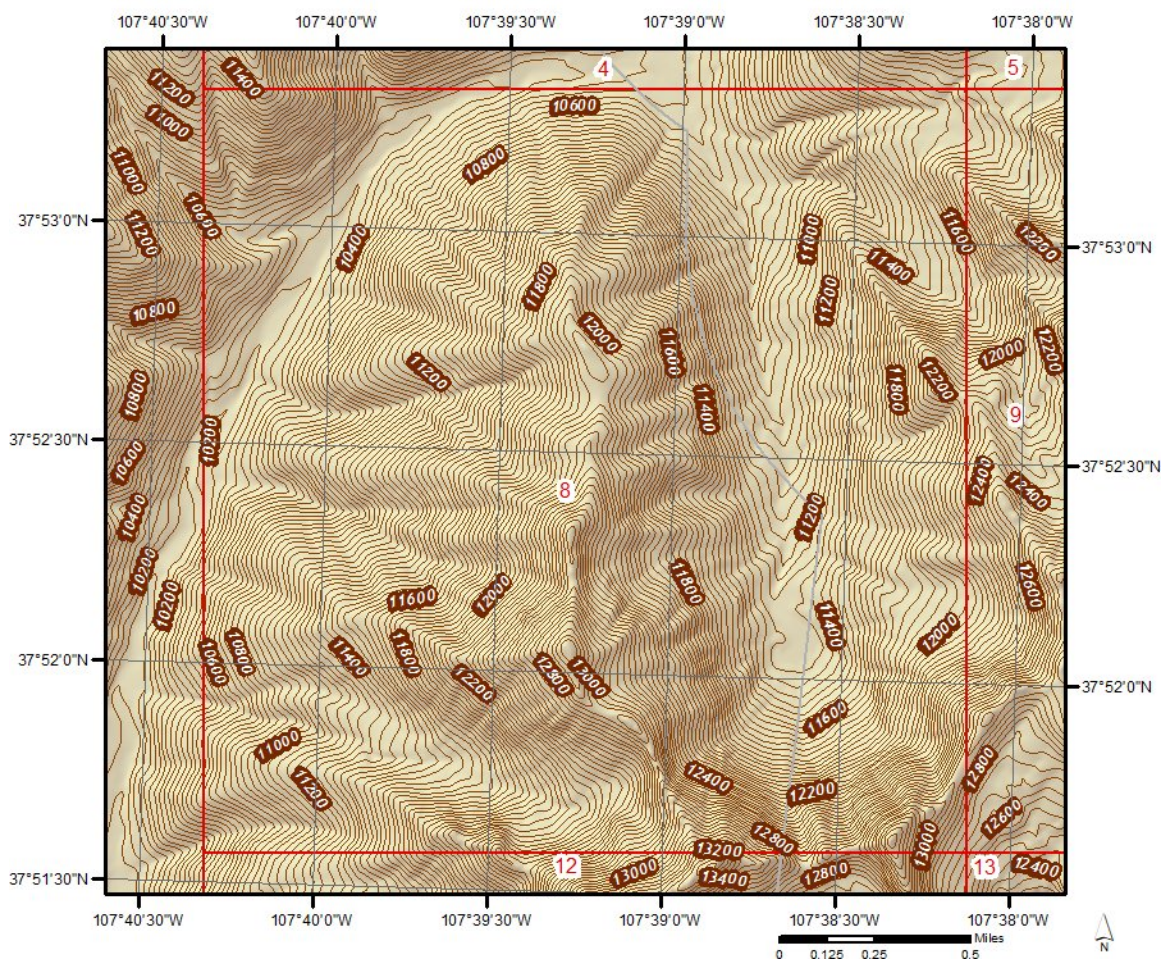


## Topographic Information



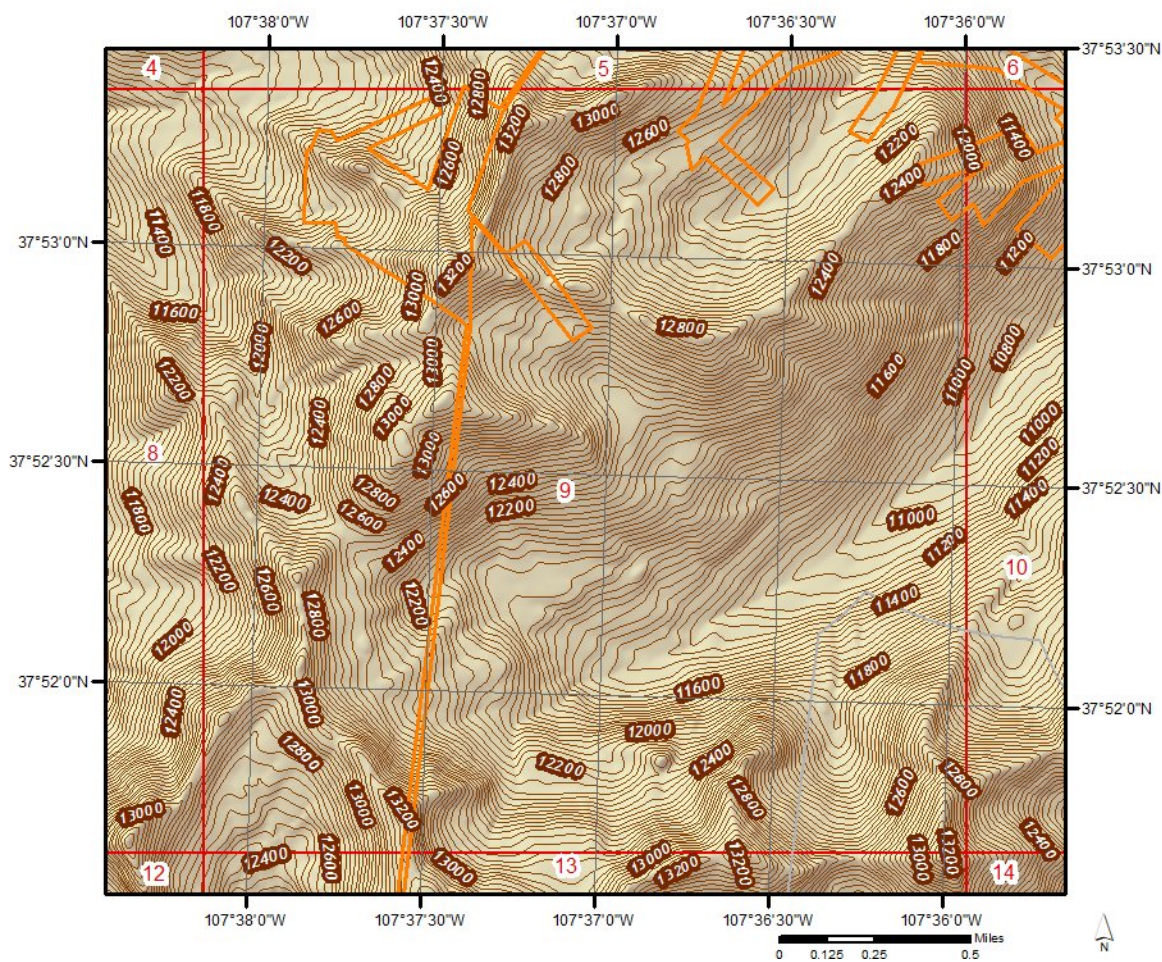


## Topographic Information

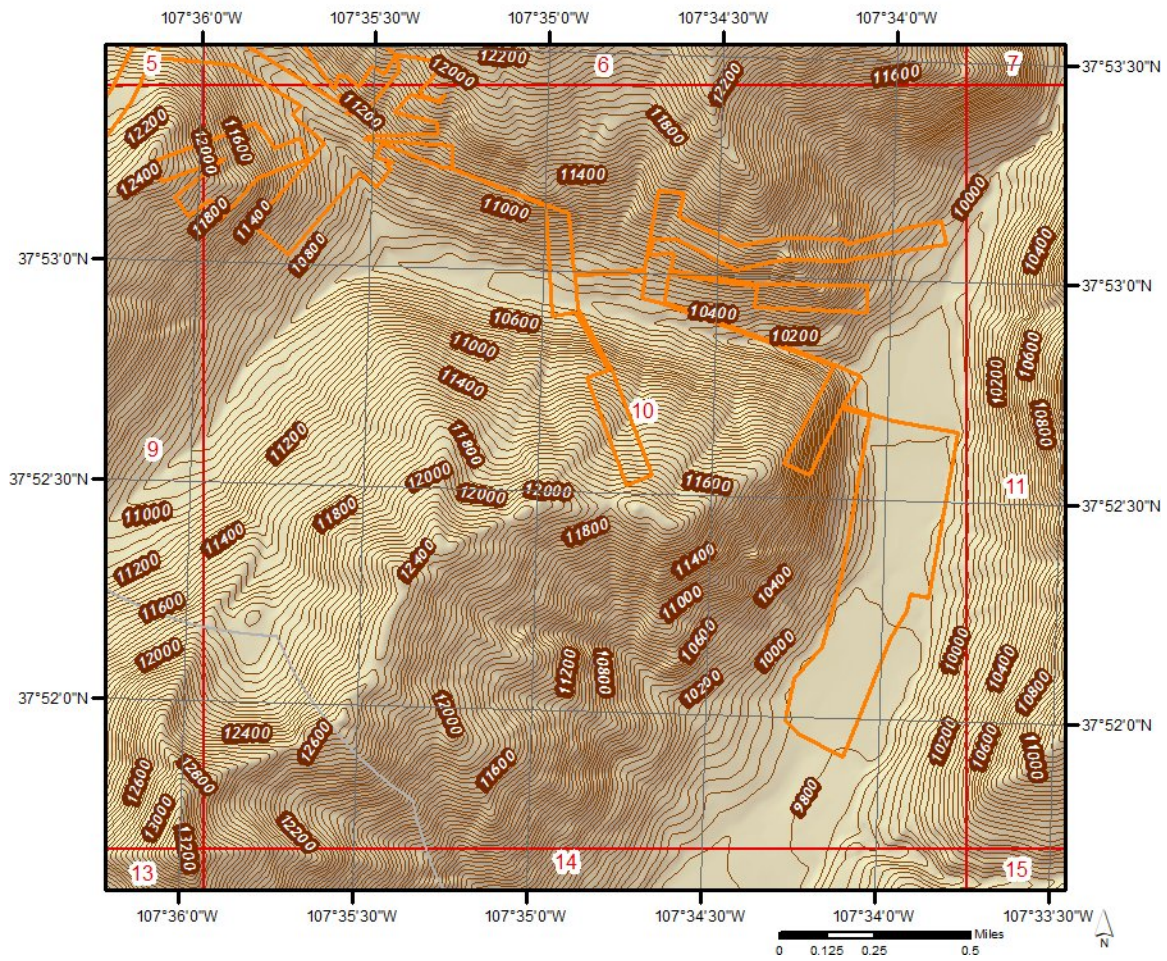




## Topographic Information

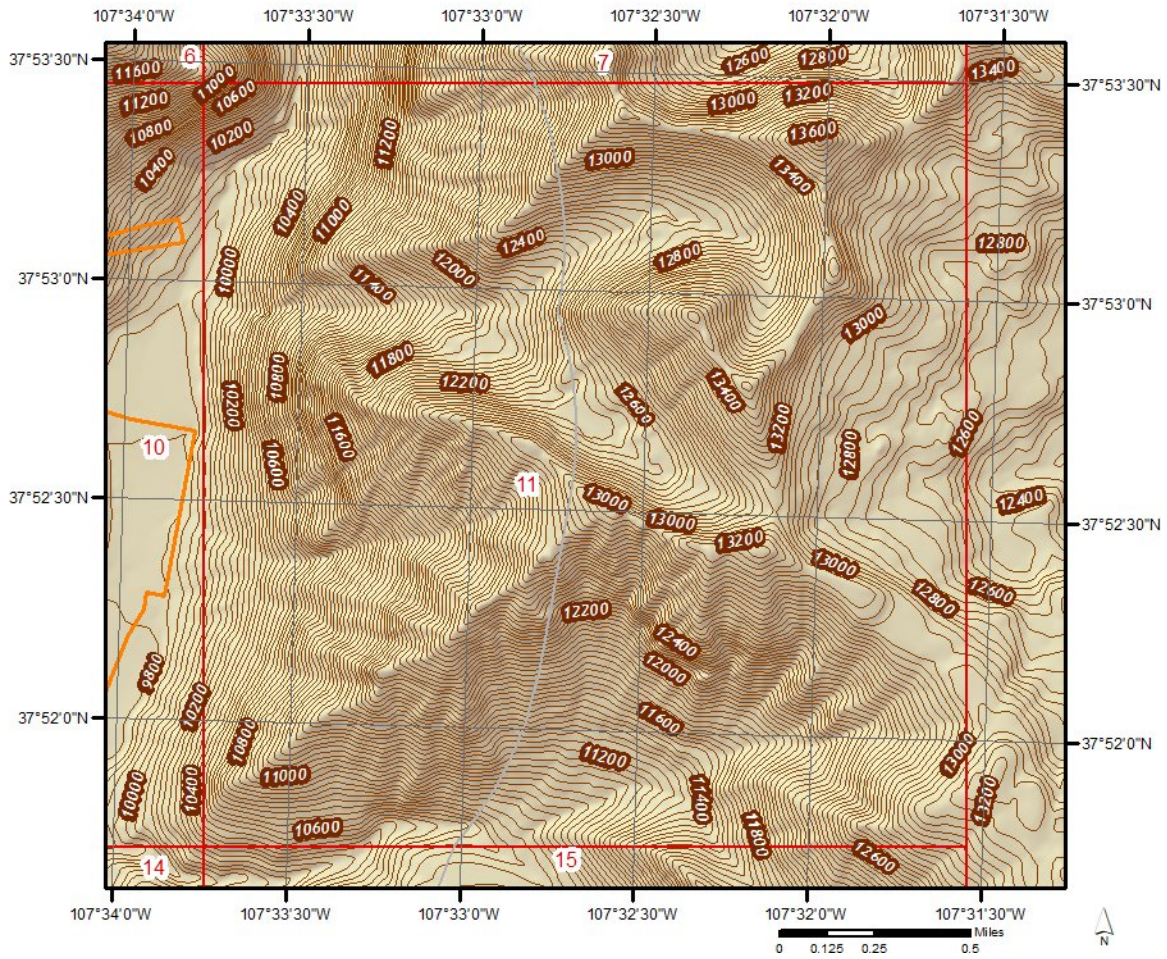


## Topographic Information

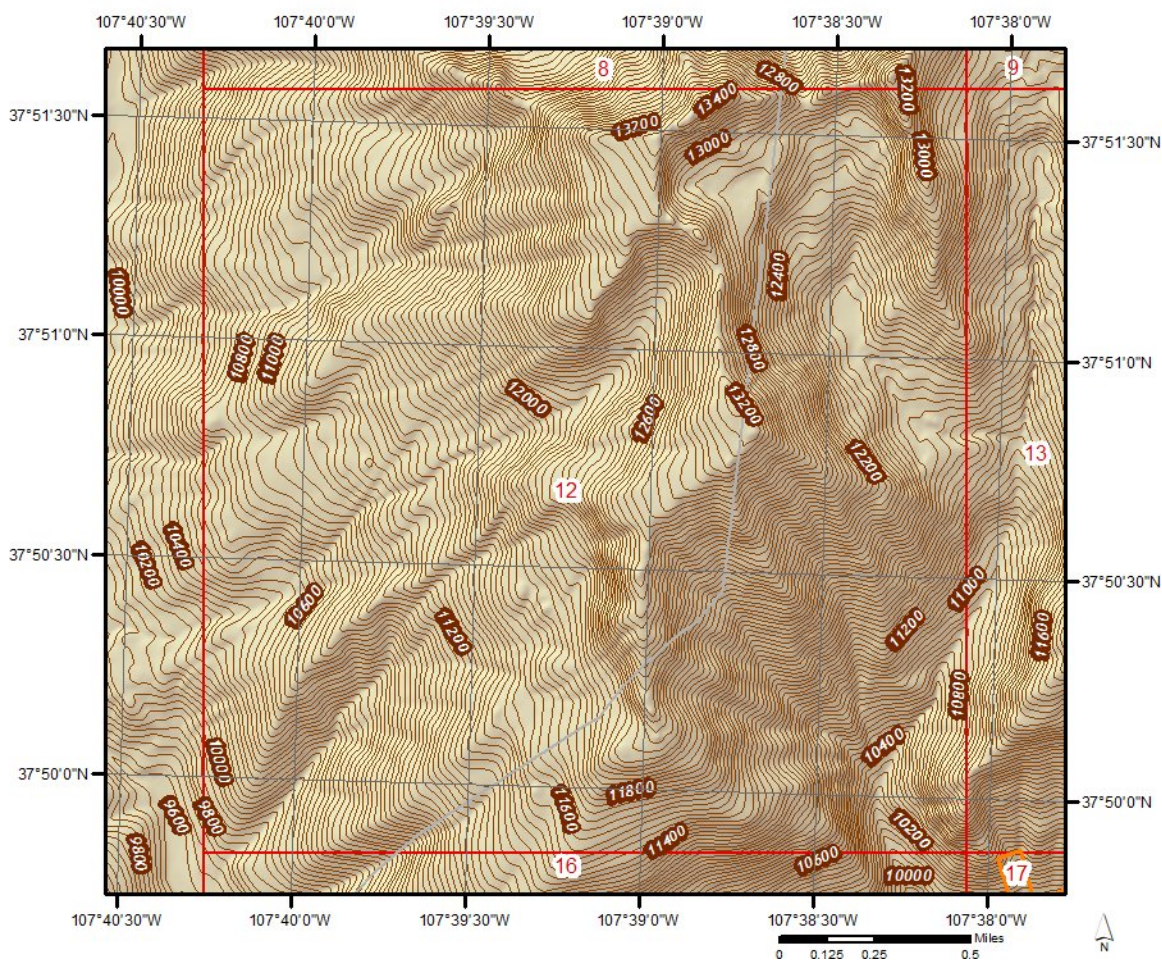




## Topographic Information

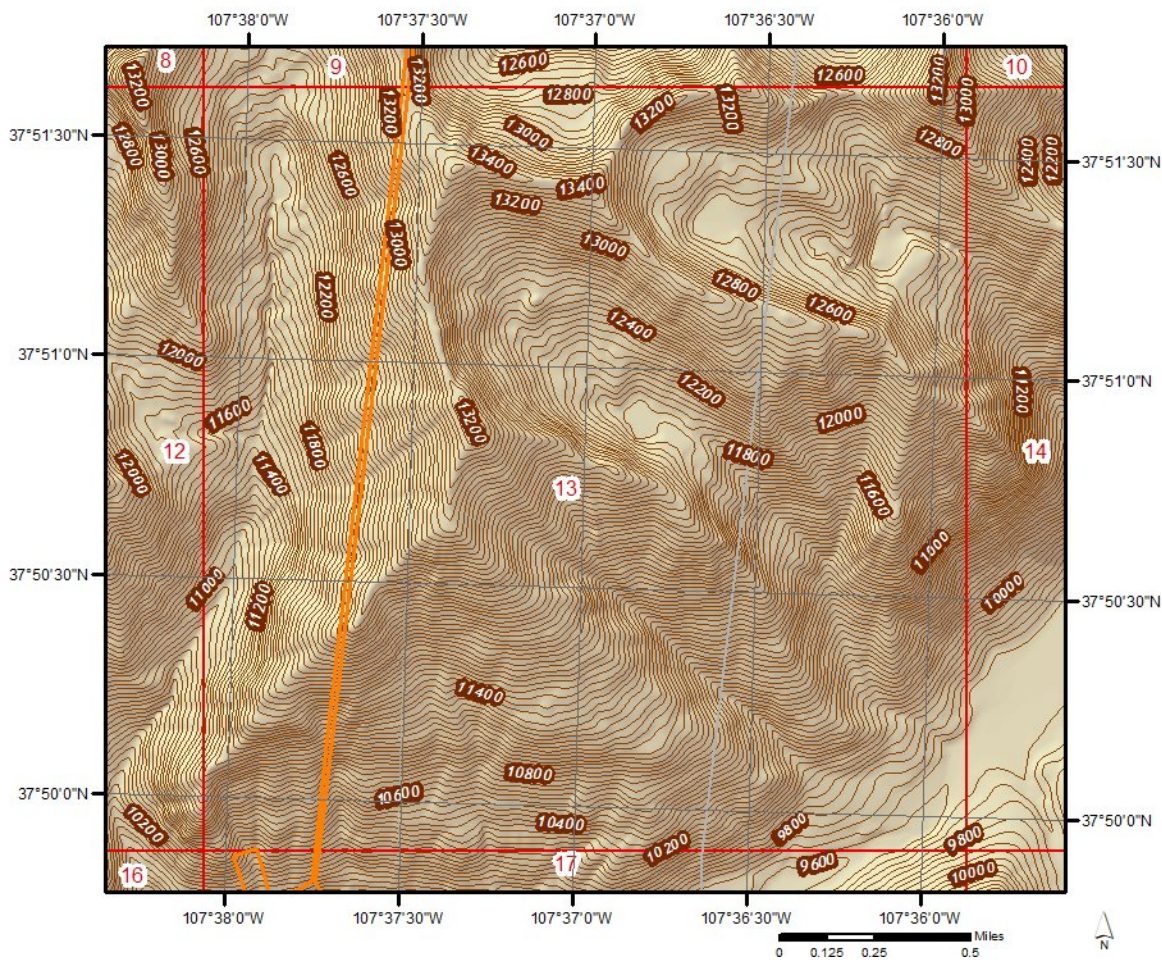


## Topographic Information

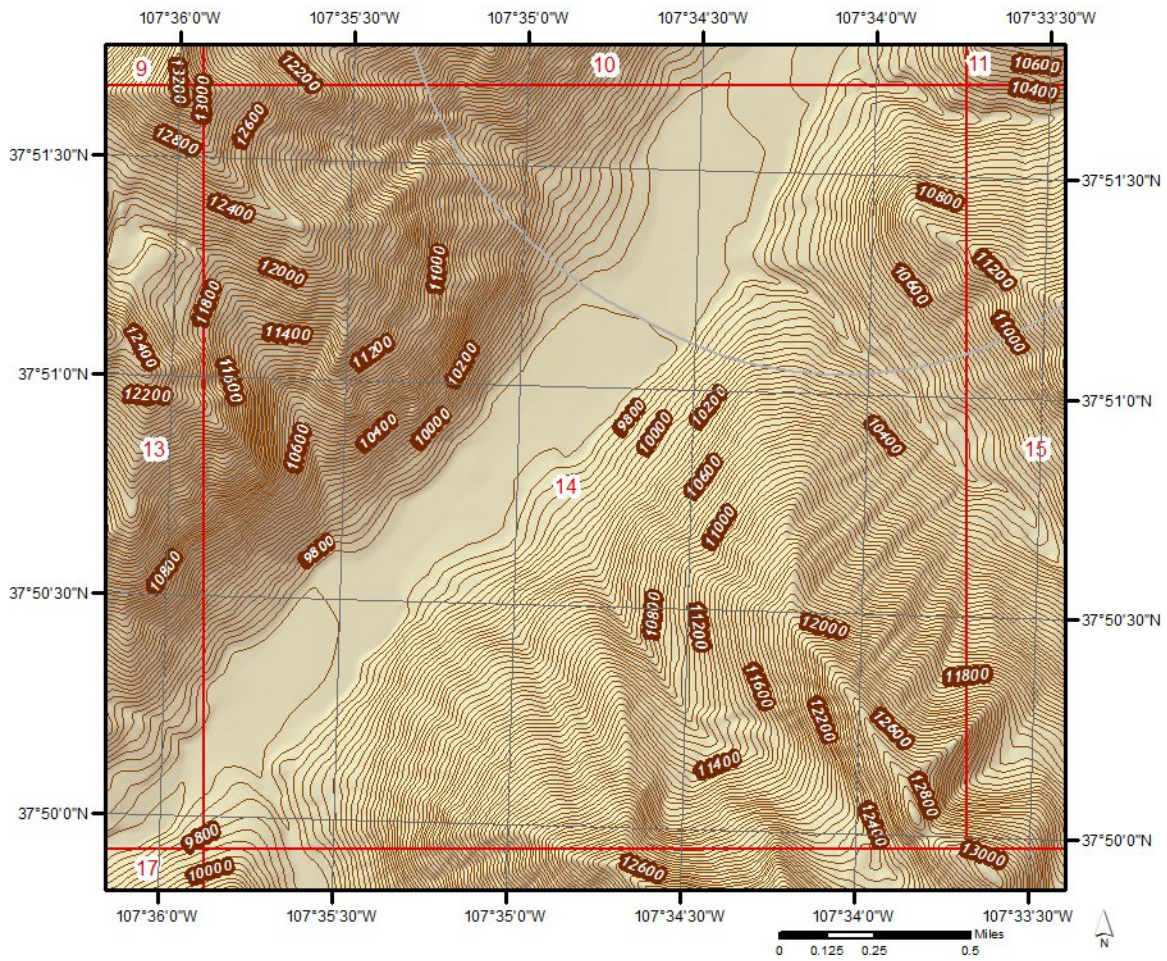




## Topographic Information

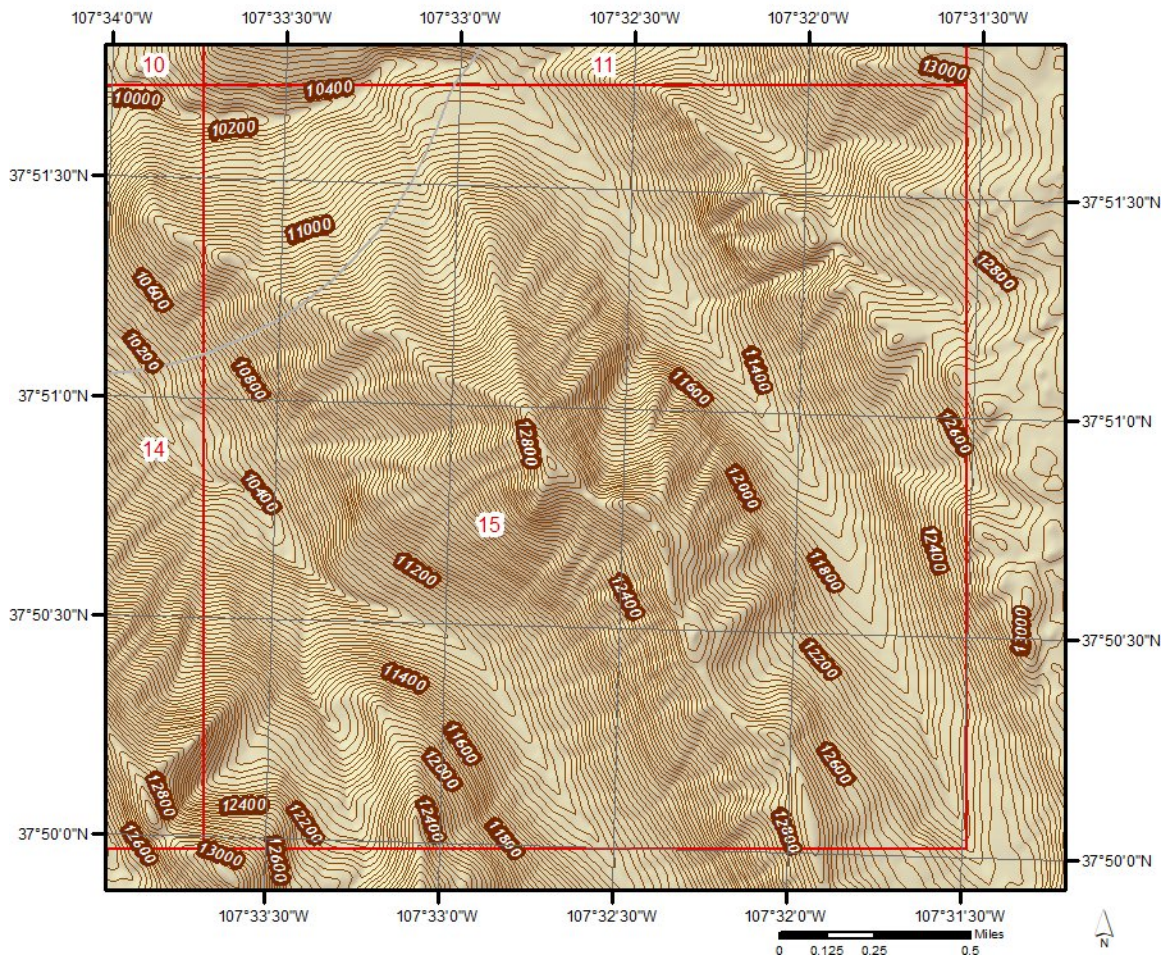


## Topographic Information



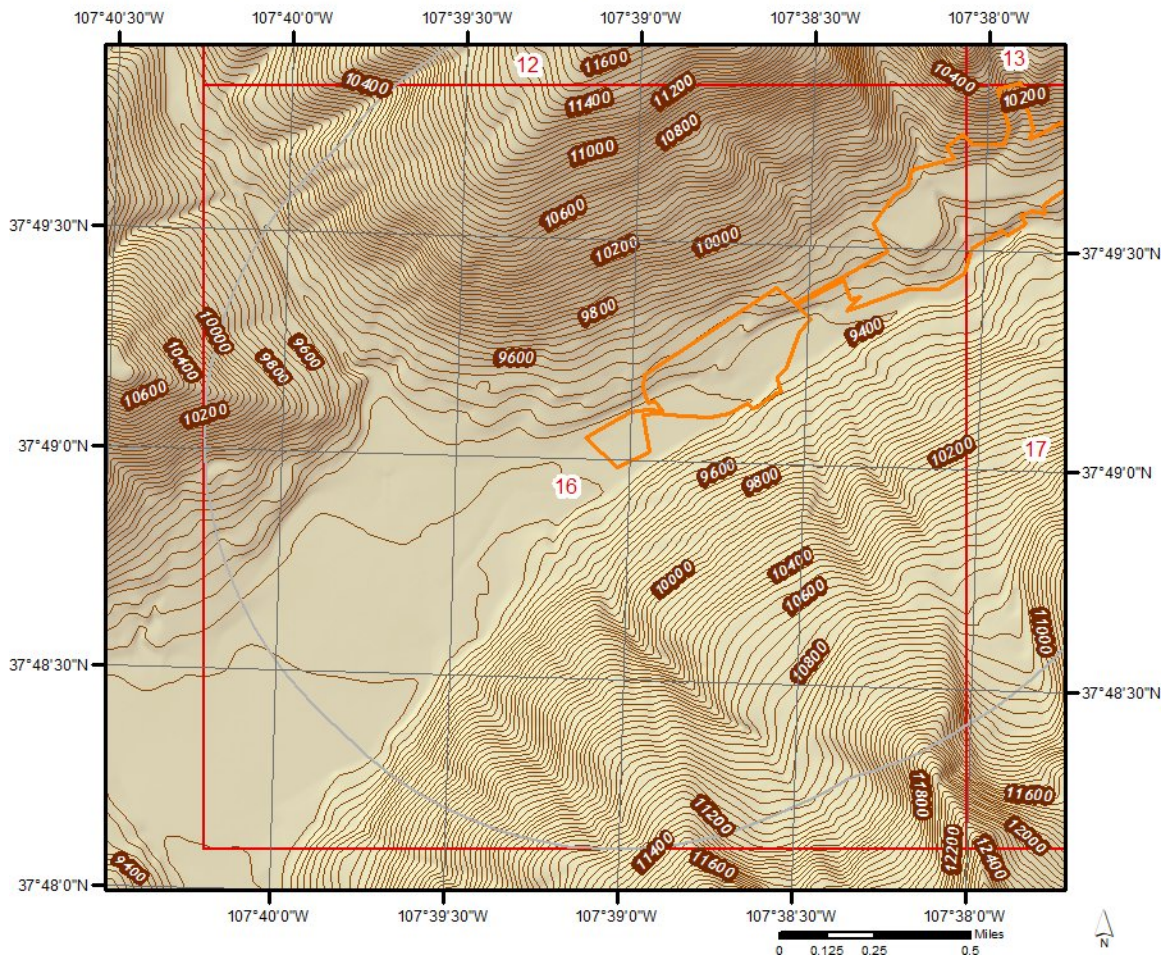


## Topographic Information

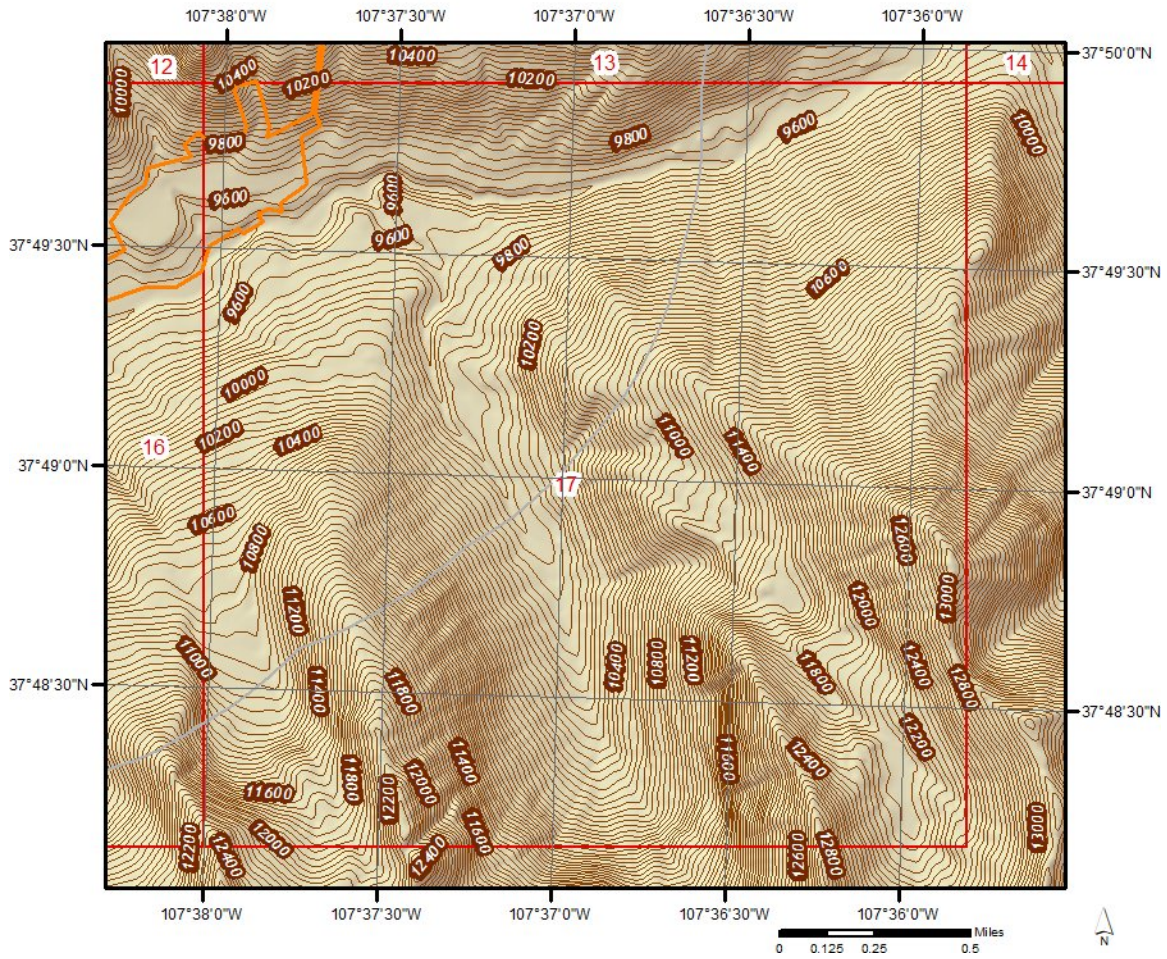




## Topographic Information

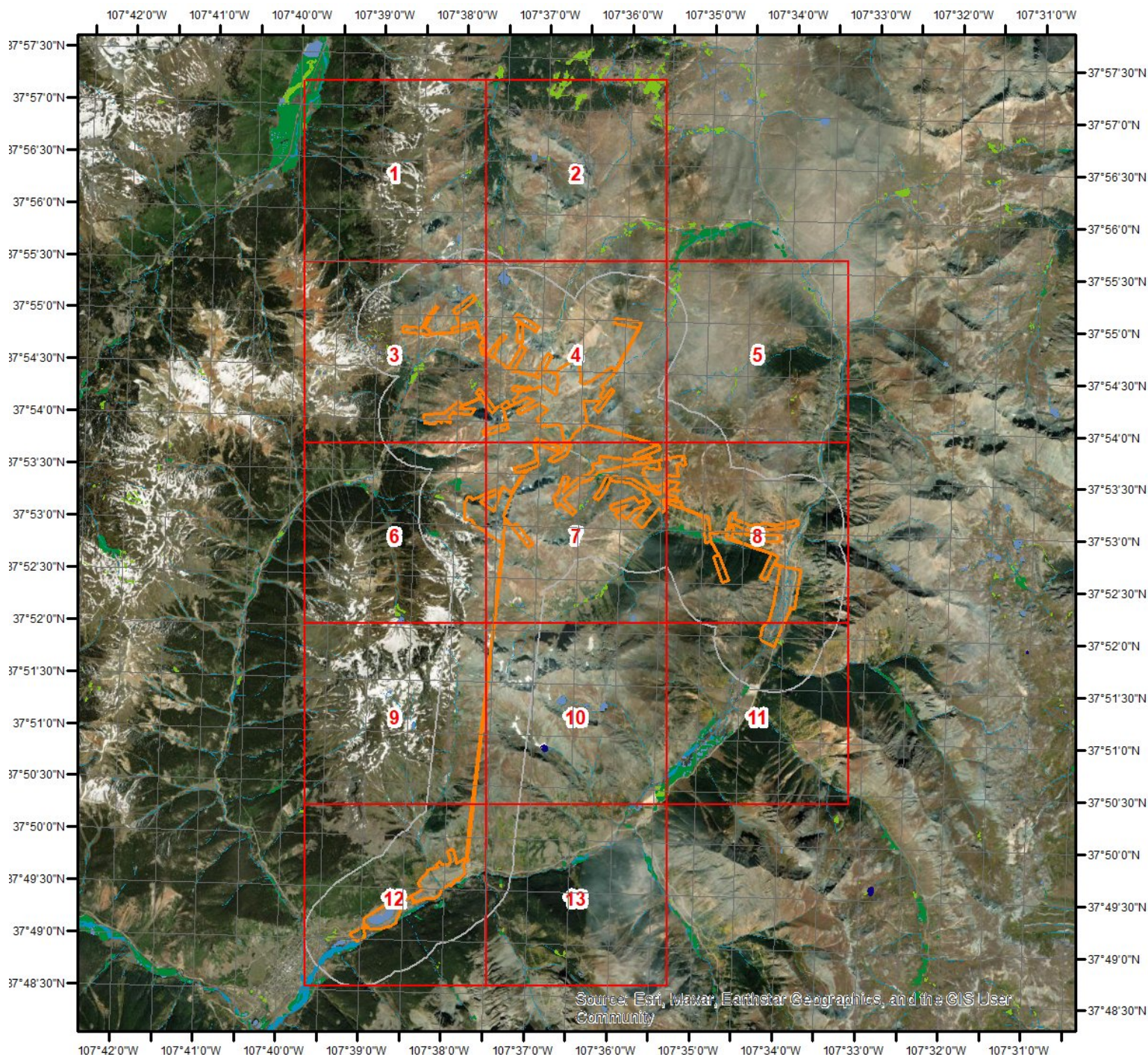


## Topographic Information

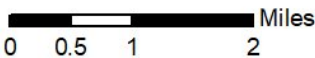




# Hydrologic Information



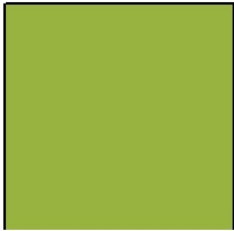
## Wetland



This map shows wetland existence using data from US Fish & Wildlife. Data coverage is shown to the right. Gray indicates no data available in the area.

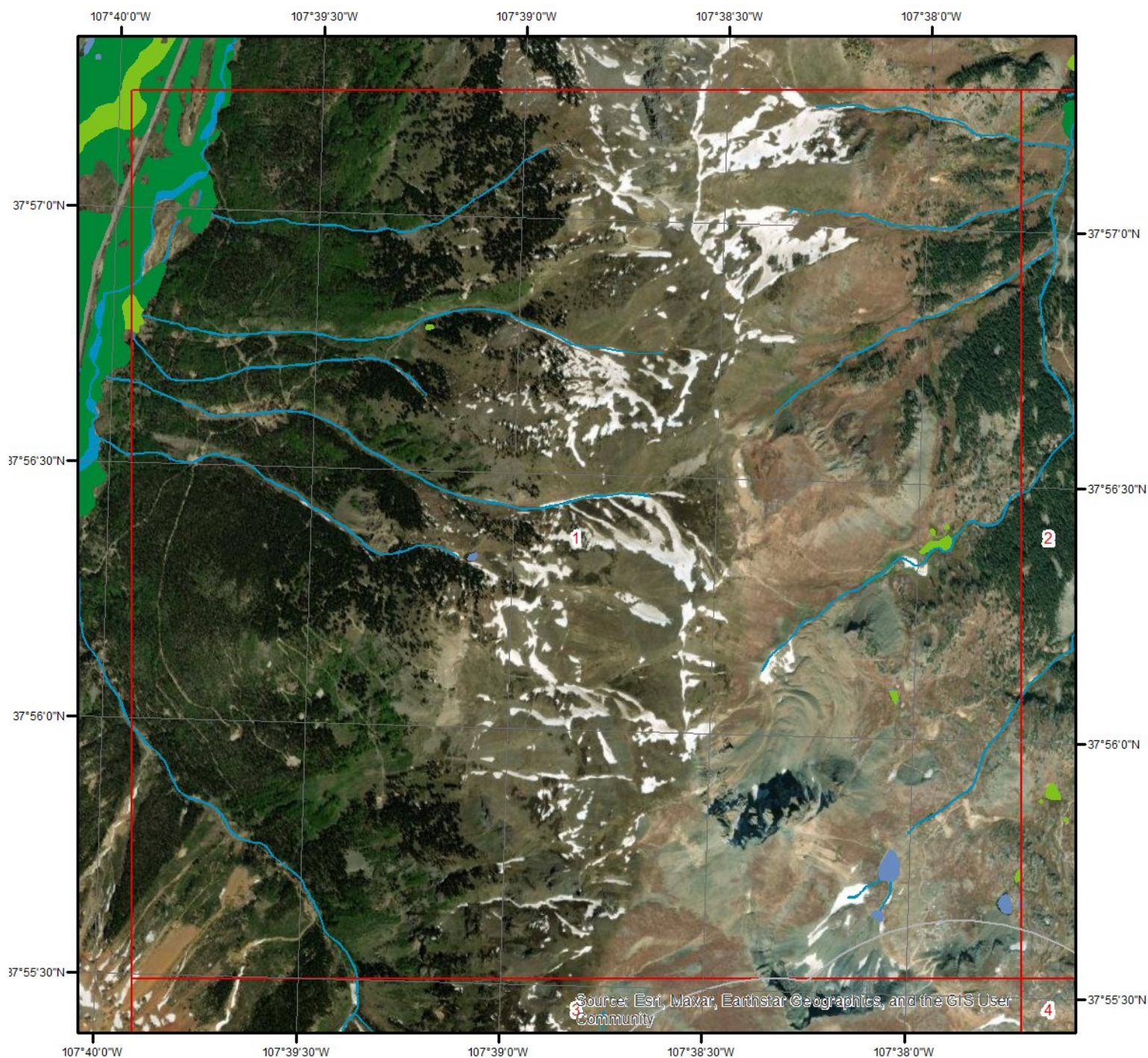
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland

- Freshwater Pond
- Lake
- Other
- Riverine

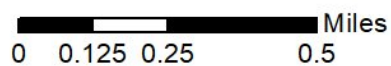




Hydrologic Information



Wetland Type - Page 1



This map shows wetland existence using data from US Fish & Wildlife.  
Data coverage is shown to the right. Gray indicates no data available in the area.

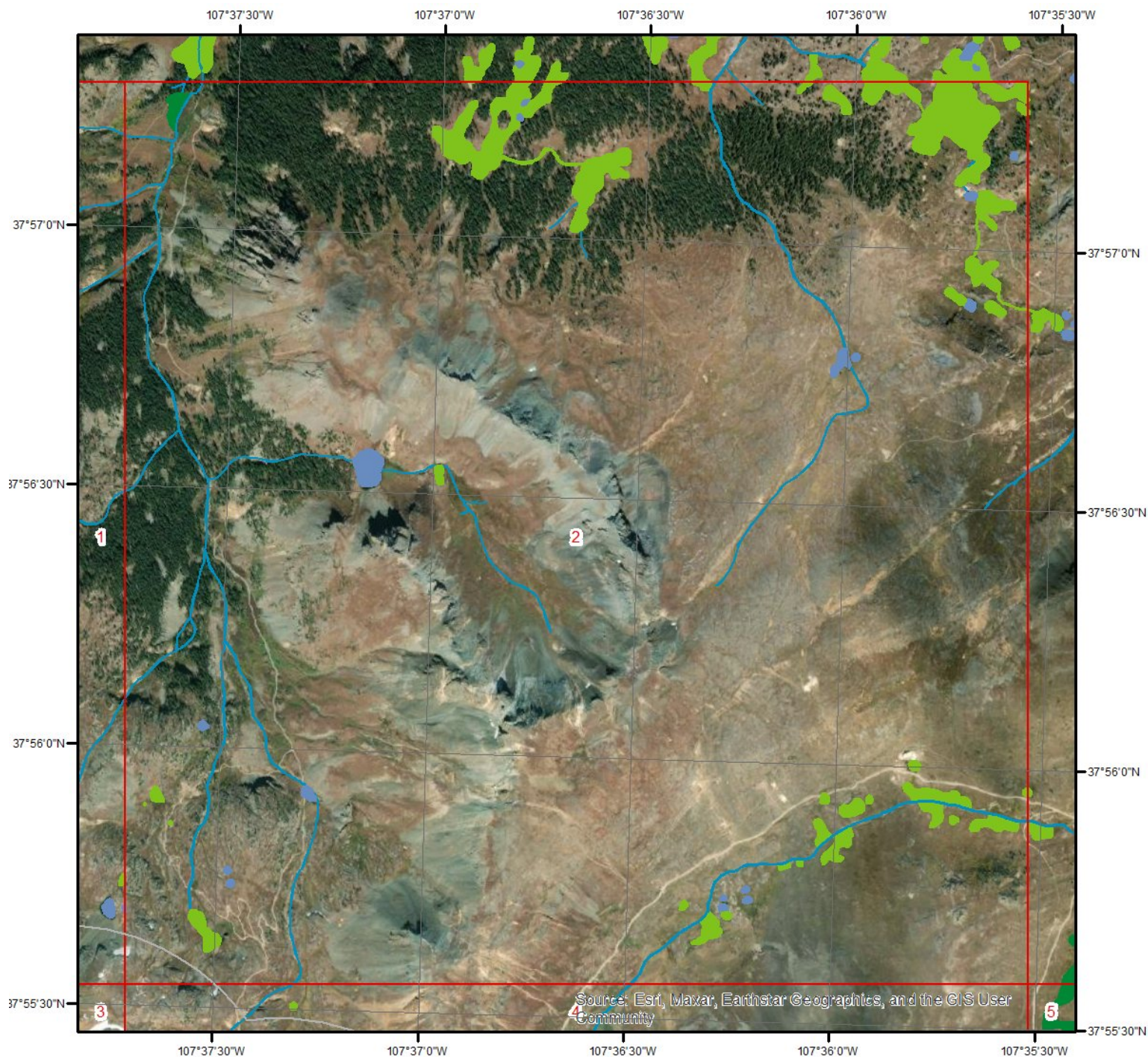
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland

- Freshwater Pond
- Lake
- Other
- Riverine





Hydrologic Information

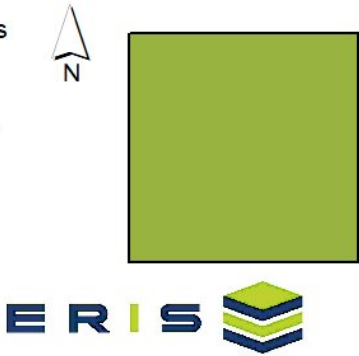


Wetland Type - Page 2

This map shows wetland existence using data from US Fish & Wildlife.  
Data coverage is shown to the right. Gray indicates no data available in the area.

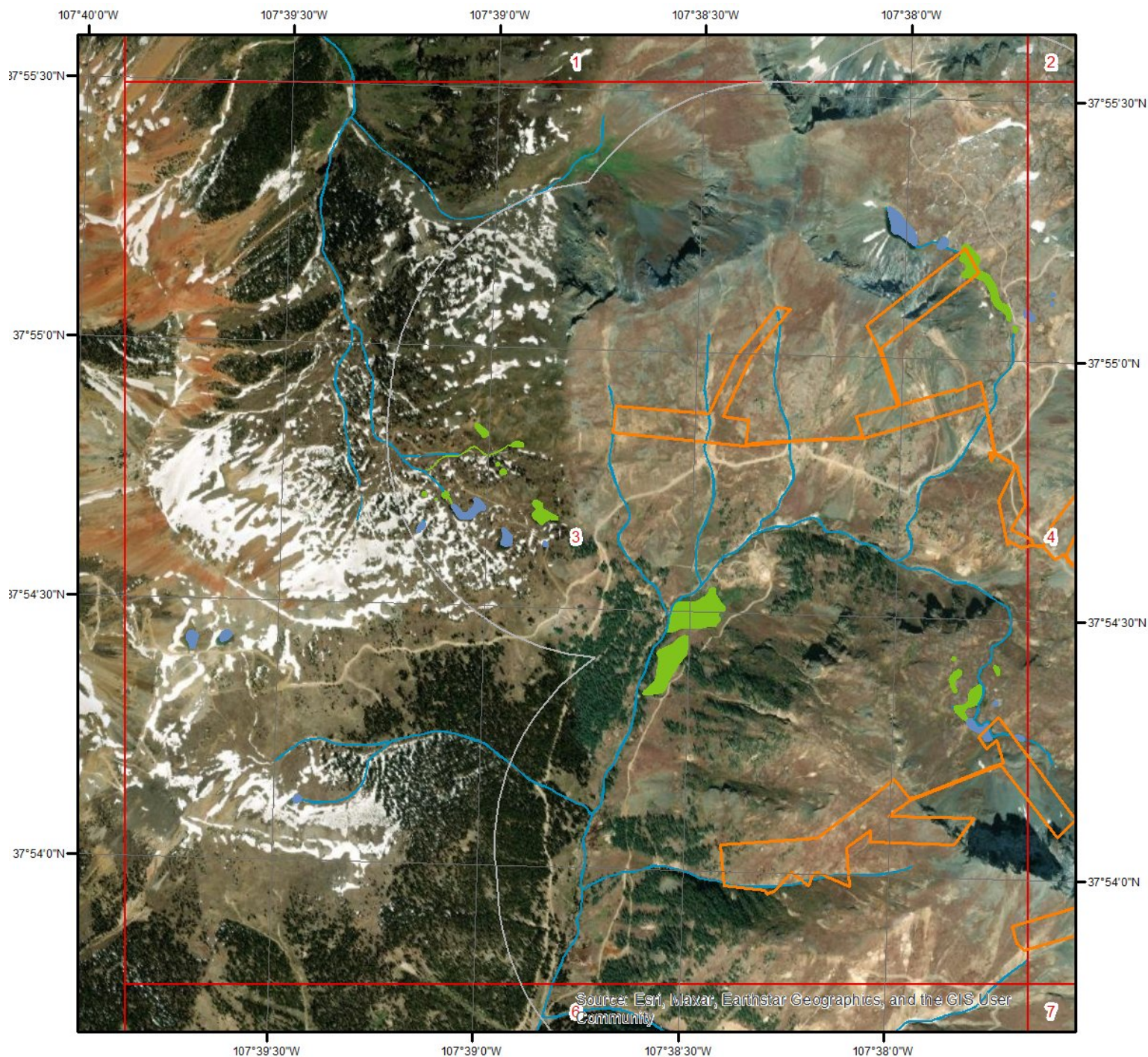
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland

- Freshwater Pond
- Lake
- Other
- Riverine

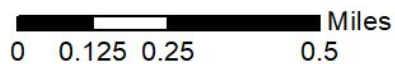












Hydrologic Information



Wetland Type - Page 3



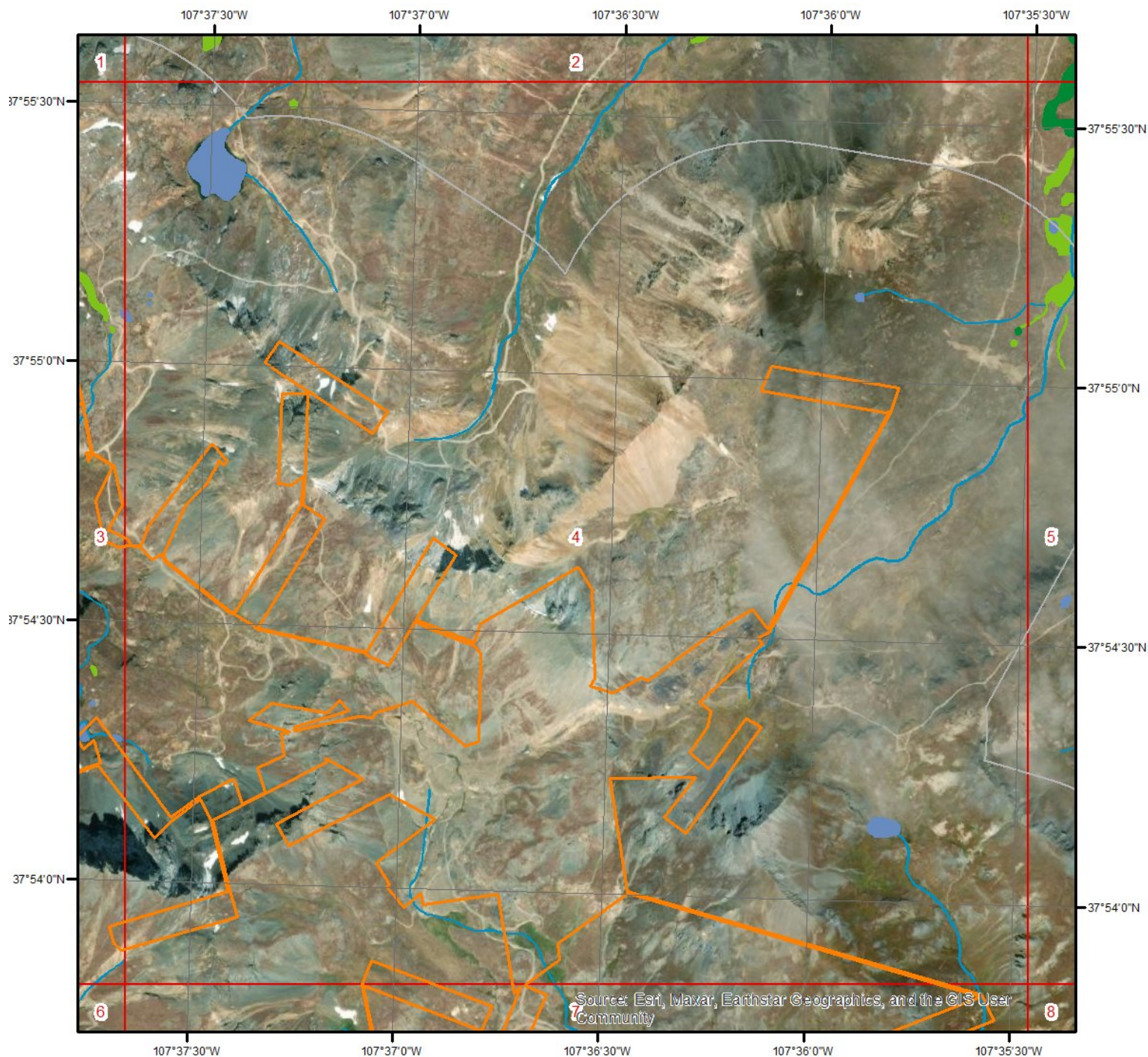
This map shows wetland existence using data from US Fish & Wildlife.  
Data coverage is shown to the right. Gray indicates no data available in the area.

- |   |   |
|---|---|
|  Estuarine and Marine Deepwater    |  Freshwater Pond |
|  Estuarine and Marine Wetland      |  Lake            |
|  Freshwater Emergent Wetland       |  Other           |
|  Freshwater Forested/Shrub Wetland |  Riverine        |

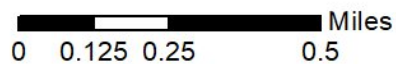




Hydrologic Information



Wetland Type - Page 4



This map shows wetland existence using data from US Fish & Wildlife.  
Data coverage is shown to the right. Gray indicates no data available in the area.

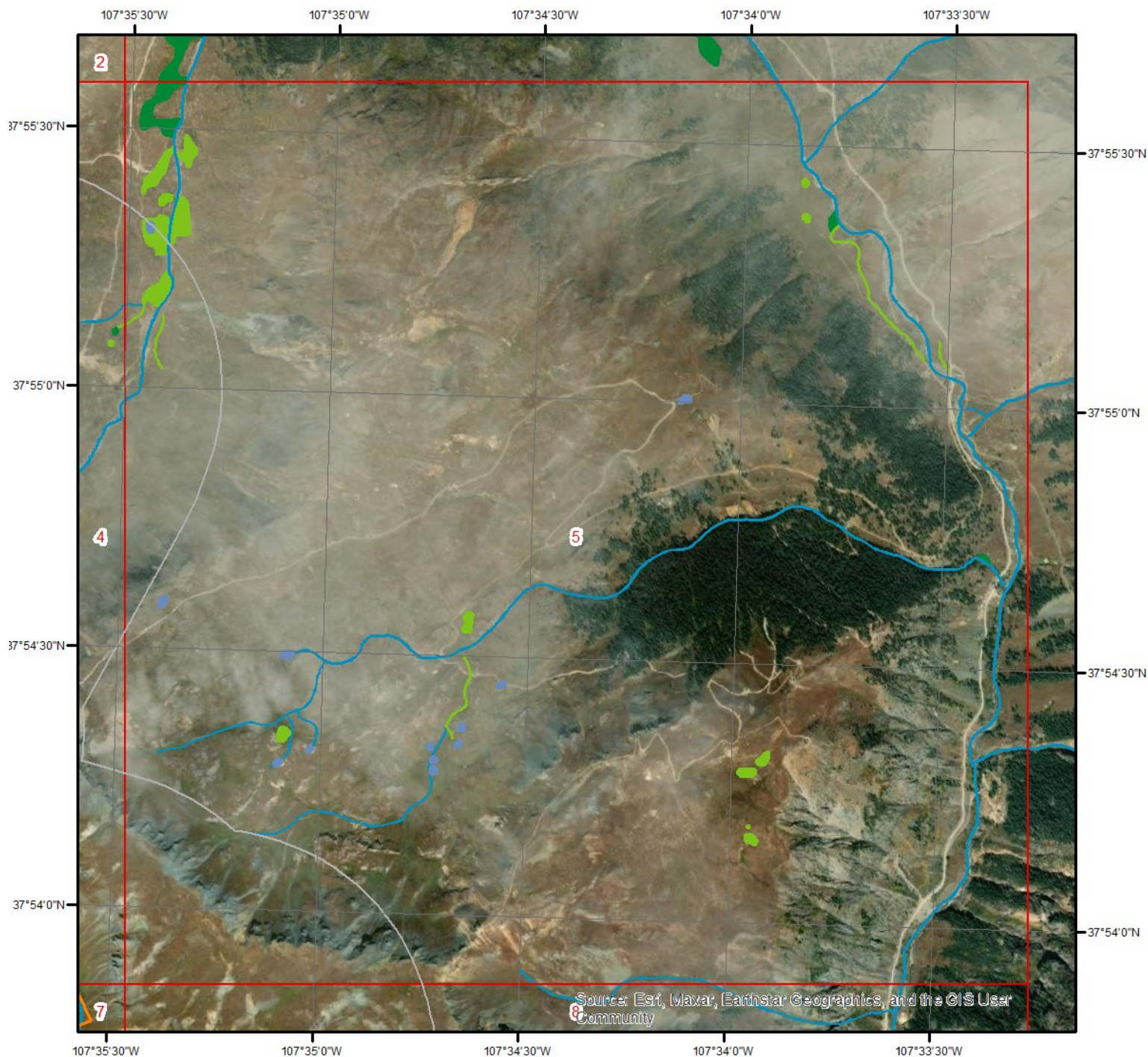
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland

- Freshwater Pond
- Lake
- Other
- Riverine





Hydrologic Information

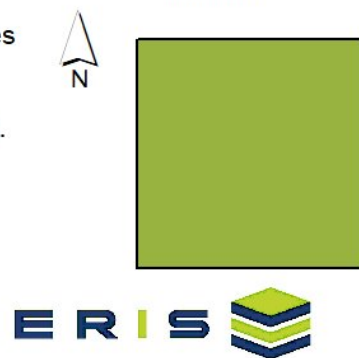


Wetland Type - Page 5

This map shows wetland existence using data from US Fish & Wildlife.  
Data coverage is shown to the right. Gray indicates no data available in the area.

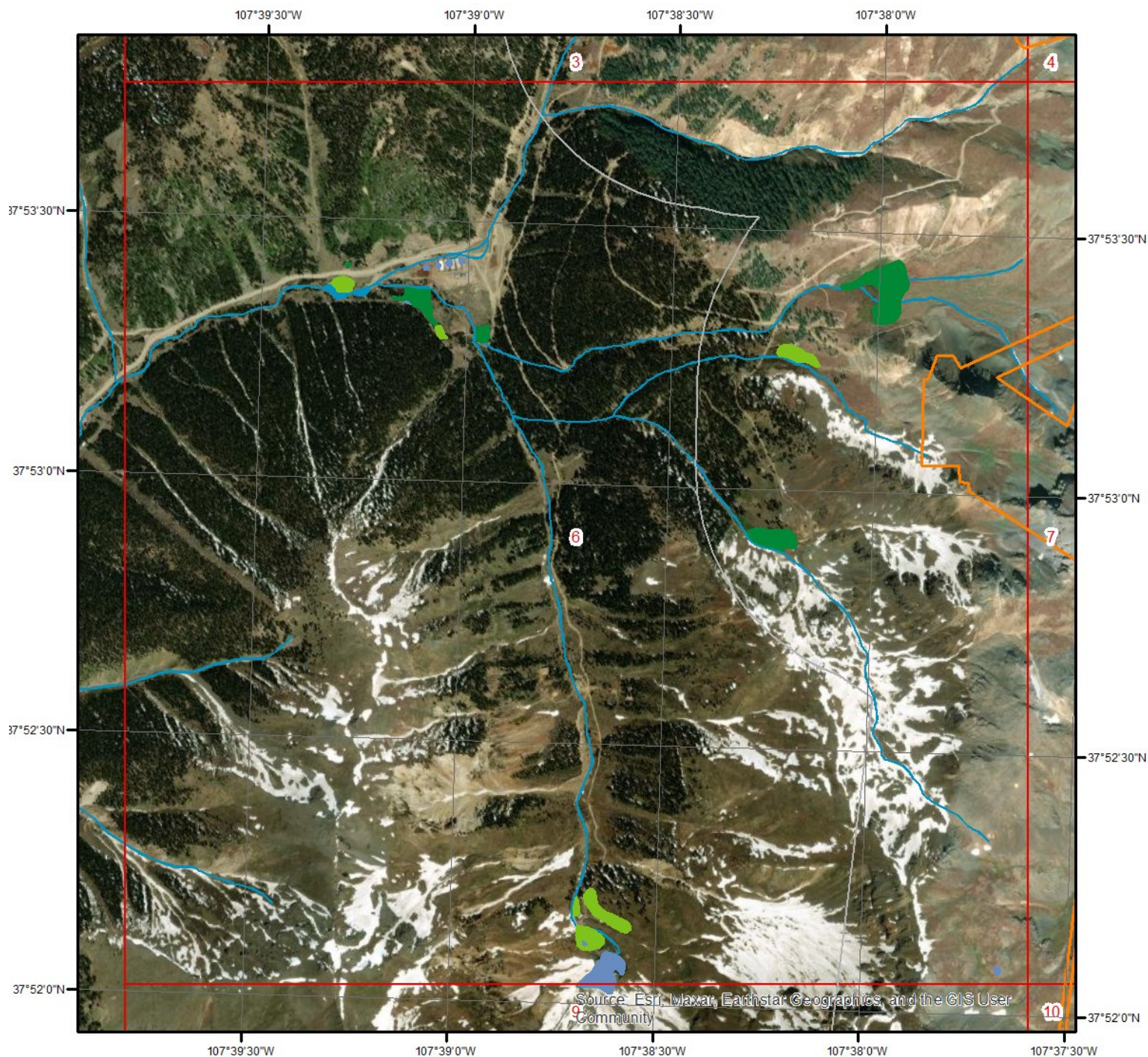
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland

- Freshwater Pond
- Lake
- Other
- Riverine





Hydrologic Information

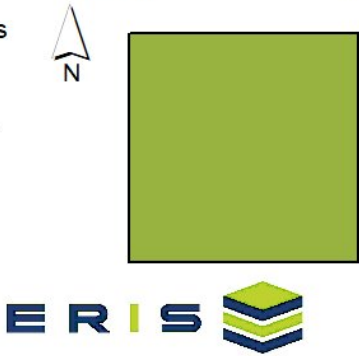


Wetland Type - Page 6

This map shows wetland existence using data from US Fish & Wildlife. Data coverage is shown to the right. Gray indicates no data available in the area.

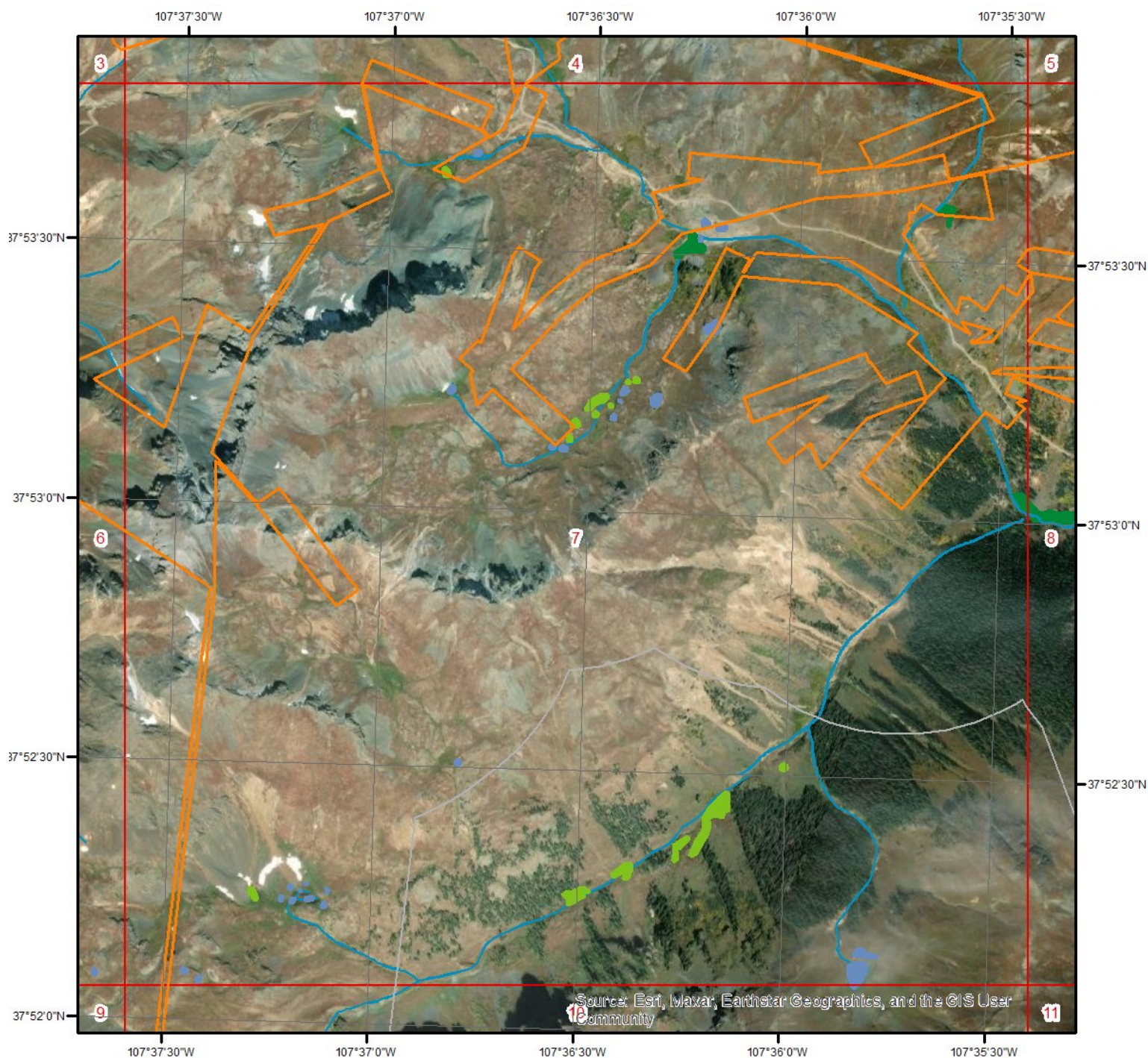
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland

- Freshwater Pond
- Lake
- Other
- Riverine

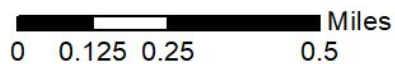




Hydrologic Information



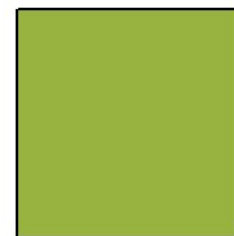
Wetland Type - Page 7



This map shows wetland existence using data from US Fish & Wildlife.  
Data coverage is shown to the right. Gray indicates no data available in the area.

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland

- Freshwater Pond
- Lake
- Other
- Riverine

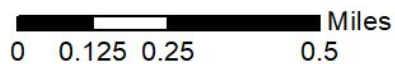




Hydrologic Information



Wetland Type - Page 8



This map shows wetland existence using data from US Fish & Wildlife.  
Data coverage is shown to the right. Gray indicates no data available in the area.

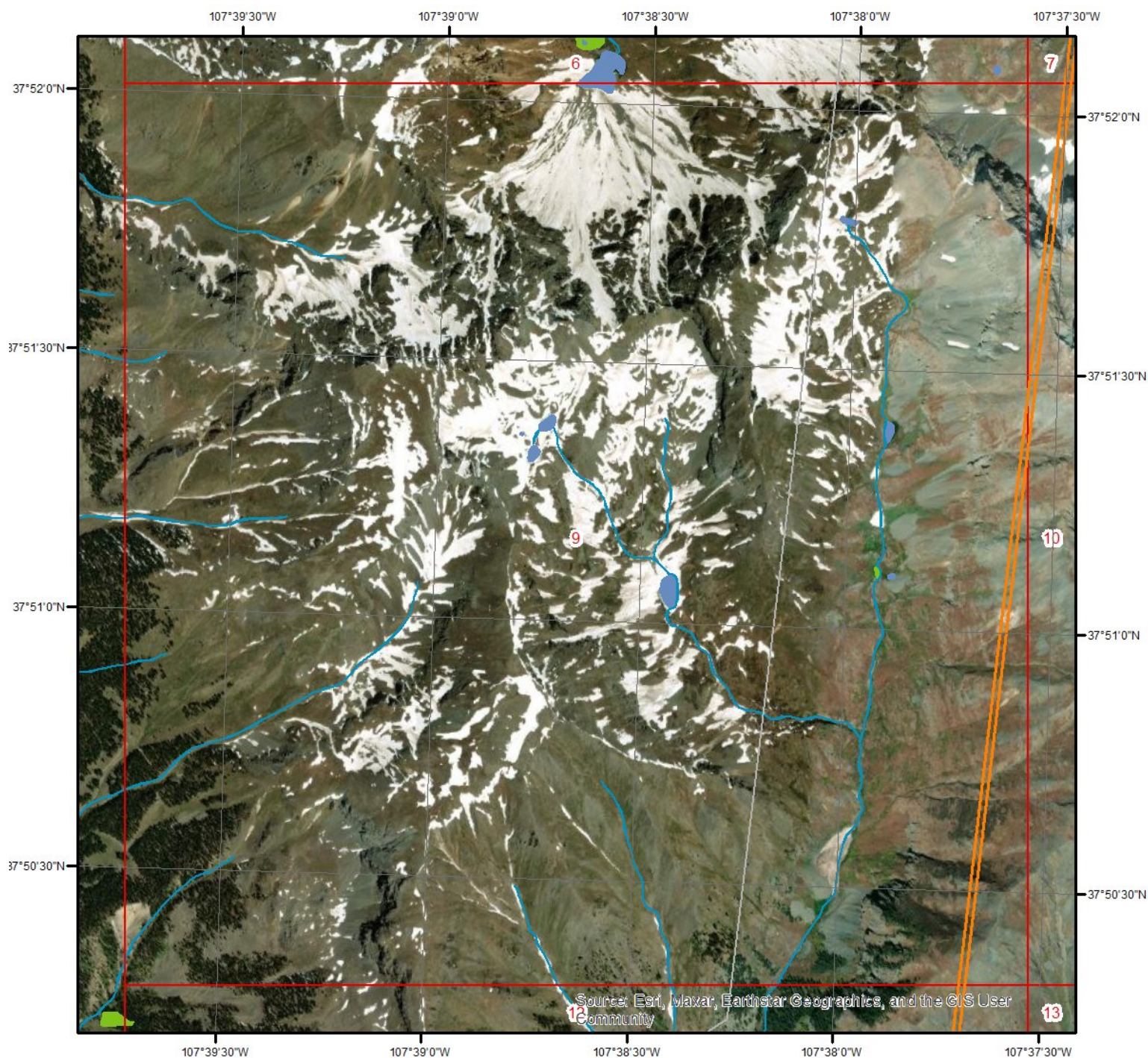
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland

- Freshwater Pond
- Lake
- Other
- Riverine

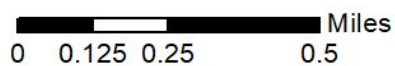




Hydrologic Information



Wetland Type - Page 9



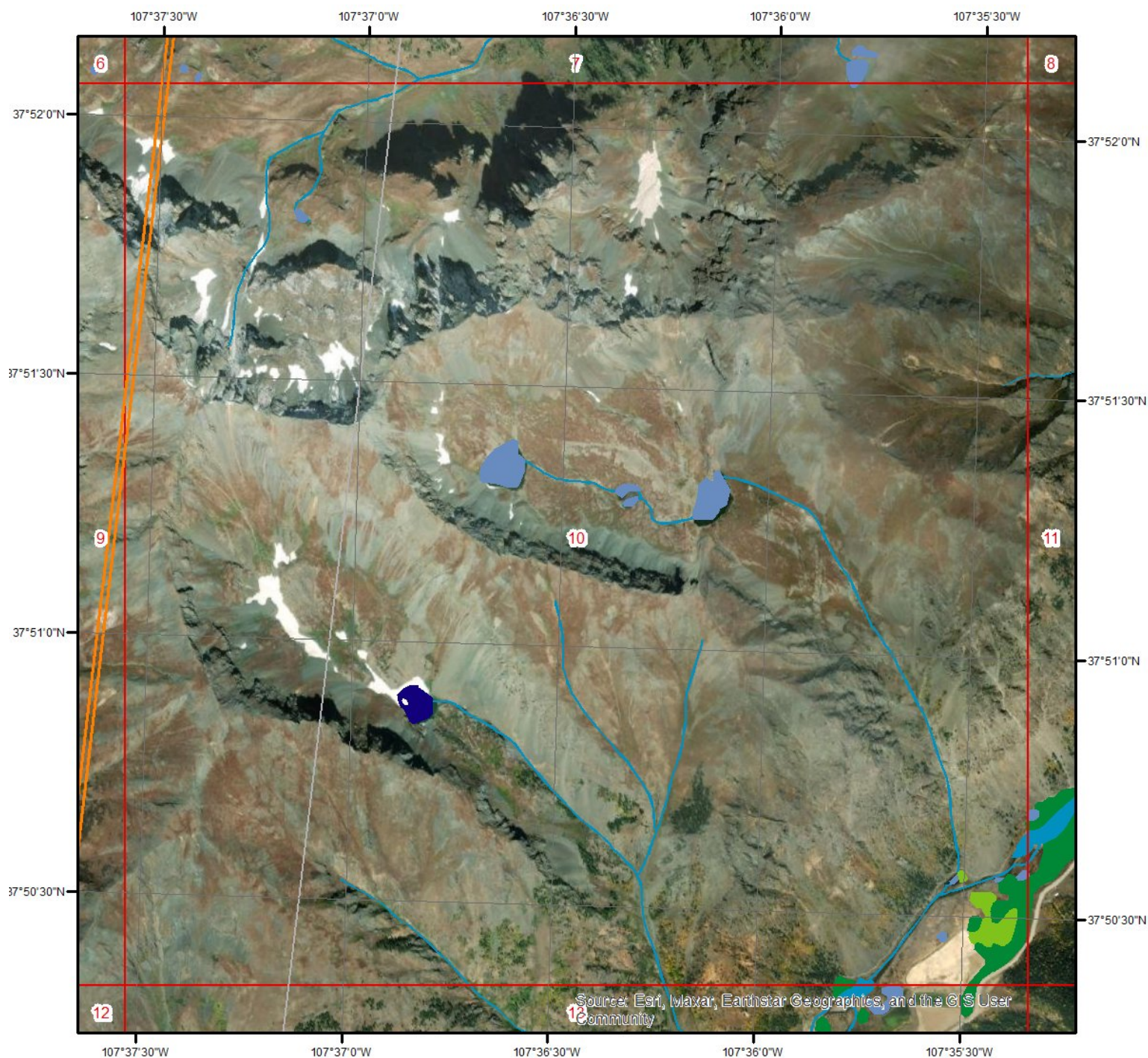
This map shows wetland existence using data from US Fish & Wildlife.  
Data coverage is shown to the right. Gray indicates no data available in the area.

- |   |   |
|---|---|
|  Estuarine and Marine Deepwater    |  Freshwater Pond |
|  Estuarine and Marine Wetland      |  Lake            |
|  Freshwater Emergent Wetland       |  Other           |
|  Freshwater Forested/Shrub Wetland |  Riverine        |

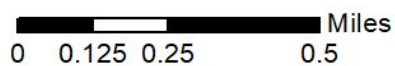












Hydrologic Information



Wetland Type - Page 10



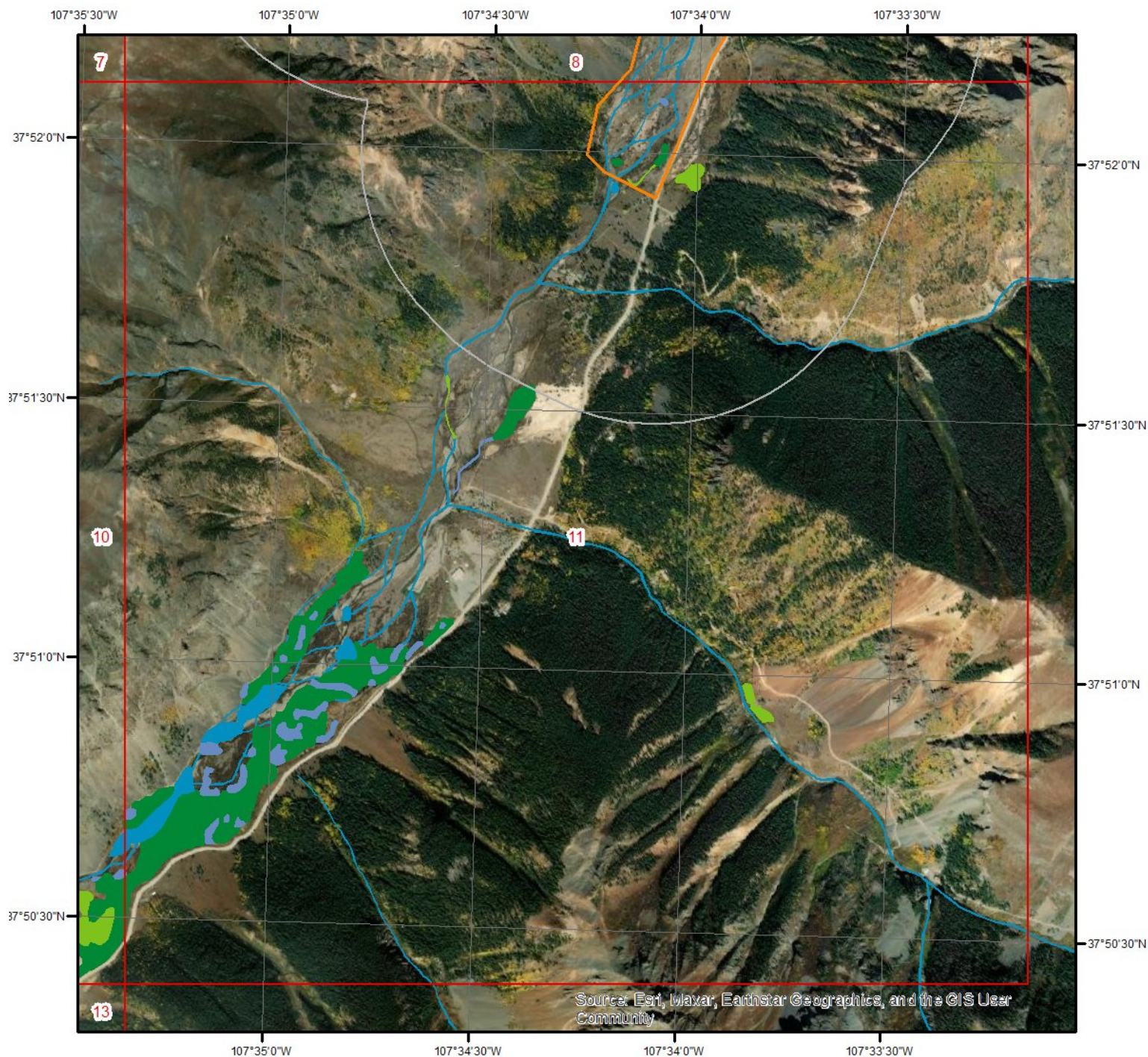
This map shows wetland existence using data from US Fish & Wildlife.  
Data coverage is shown to the right. Gray indicates no data available in the area.

- |   |   |
|---|---|
|  Estuarine and Marine Deepwater    |  Freshwater Pond |
|  Estuarine and Marine Wetland      |  Lake            |
|  Freshwater Emergent Wetland       |  Other           |
|  Freshwater Forested/Shrub Wetland |  Riverine        |

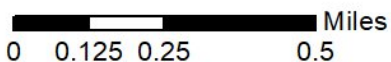




Hydrologic Information



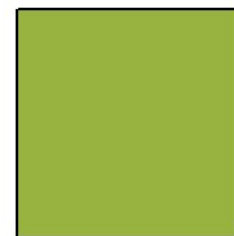
Wetland Type - Page 11



This map shows wetland existence using data from US Fish & Wildlife.  
Data coverage is shown to the right. Gray indicates no data available in the area.

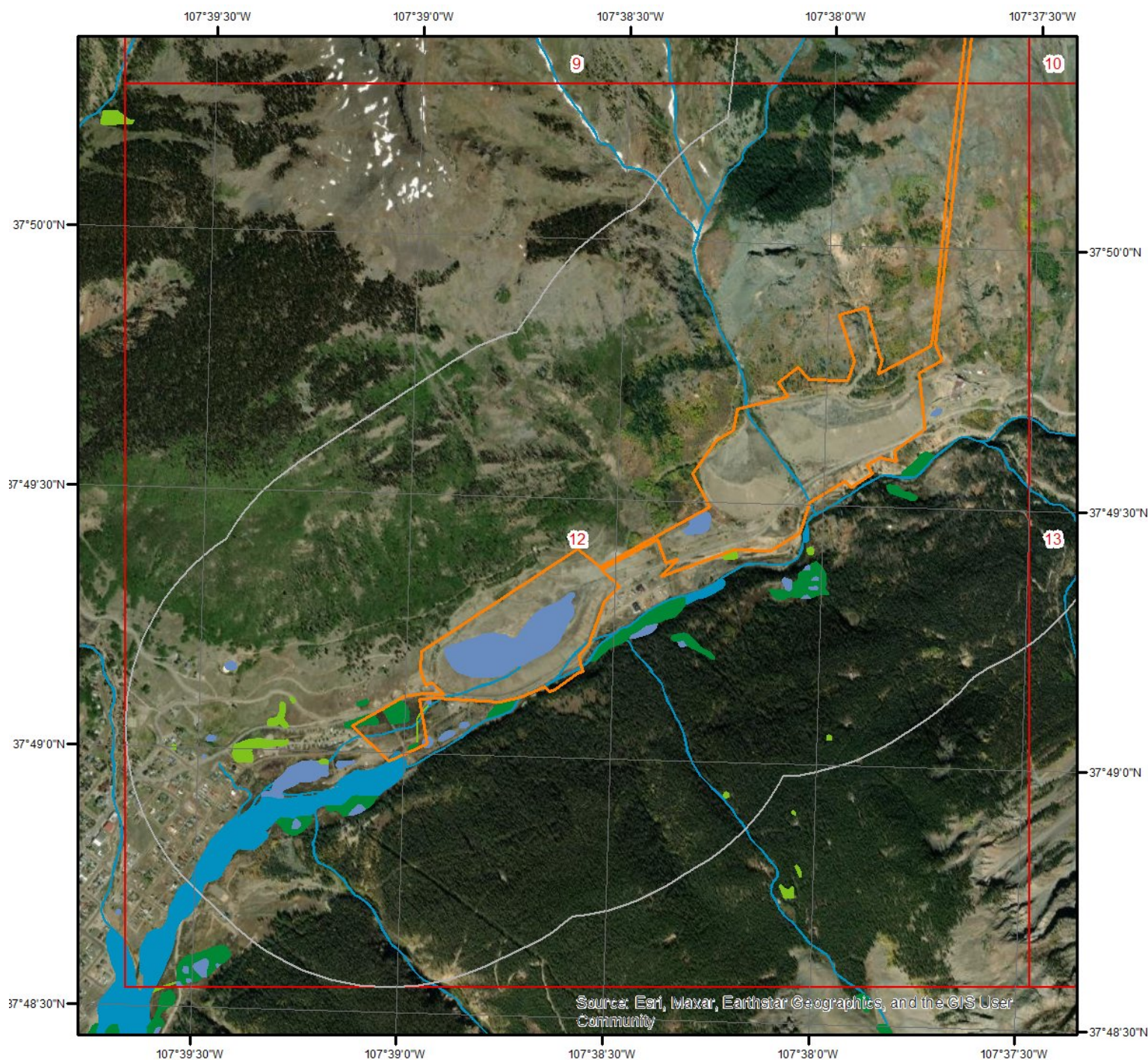
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland

- Freshwater Pond
- Lake
- Other
- Riverine



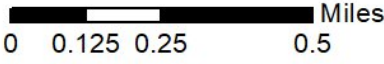


Hydrologic Information



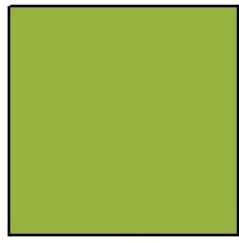
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Wetland Type - Page 12



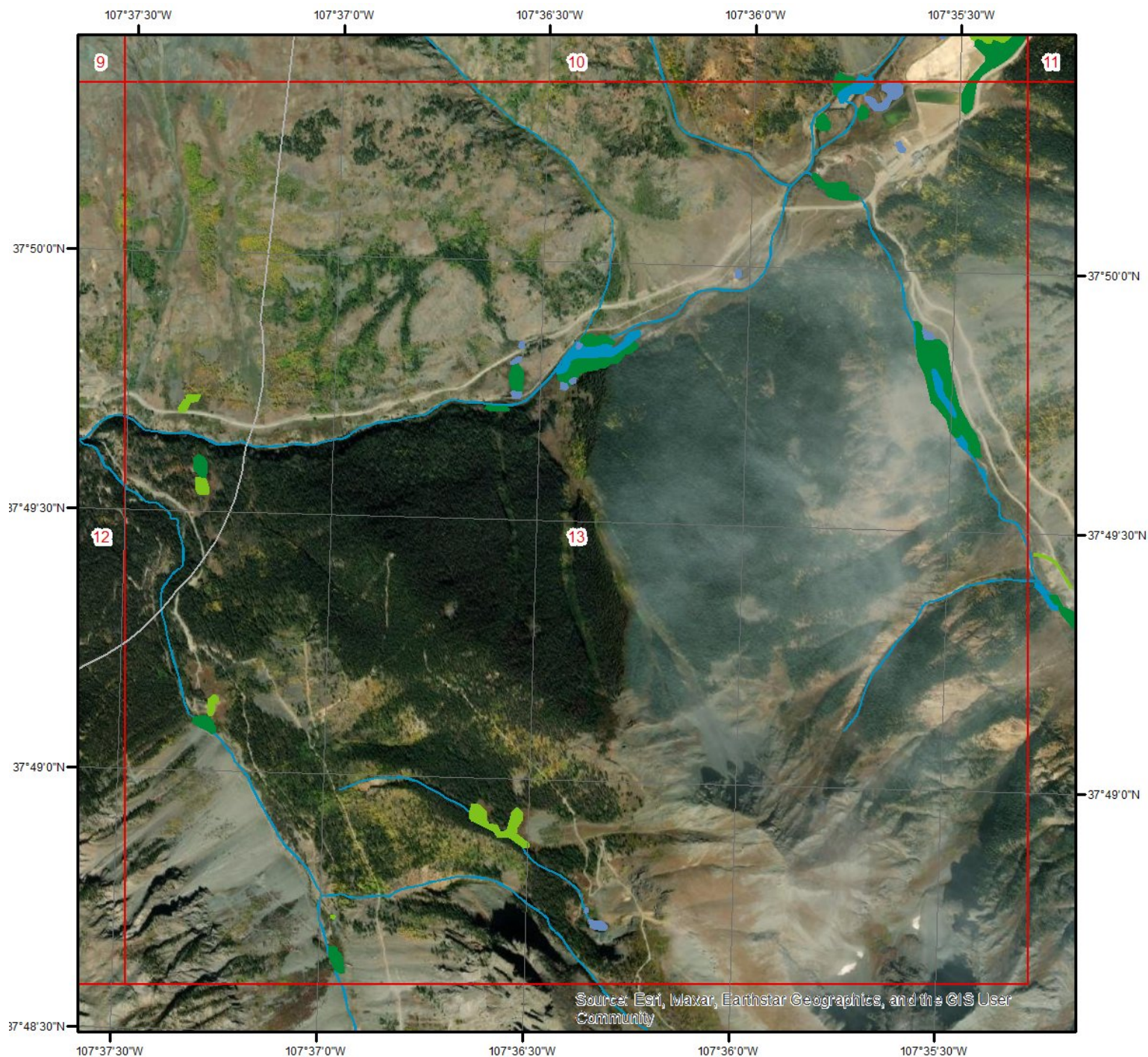
This map shows wetland existence using data from US Fish & Wildlife. Data coverage is shown to the right. Gray indicates no data available in the area.

- |   |   |
|---|---|
|  Estuarine and Marine Deepwater    |  Freshwater Pond |
|  Estuarine and Marine Wetland      |  Lake            |
|  Freshwater Emergent Wetland       |  Other           |
|  Freshwater Forested/Shrub Wetland |  Riverine        |

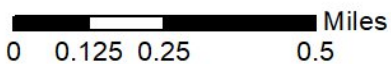




Hydrologic Information



Wetland Type - Page 13



This map shows wetland existence using data from US Fish & Wildlife.  
Data coverage is shown to the right. Gray indicates no data available in the area.

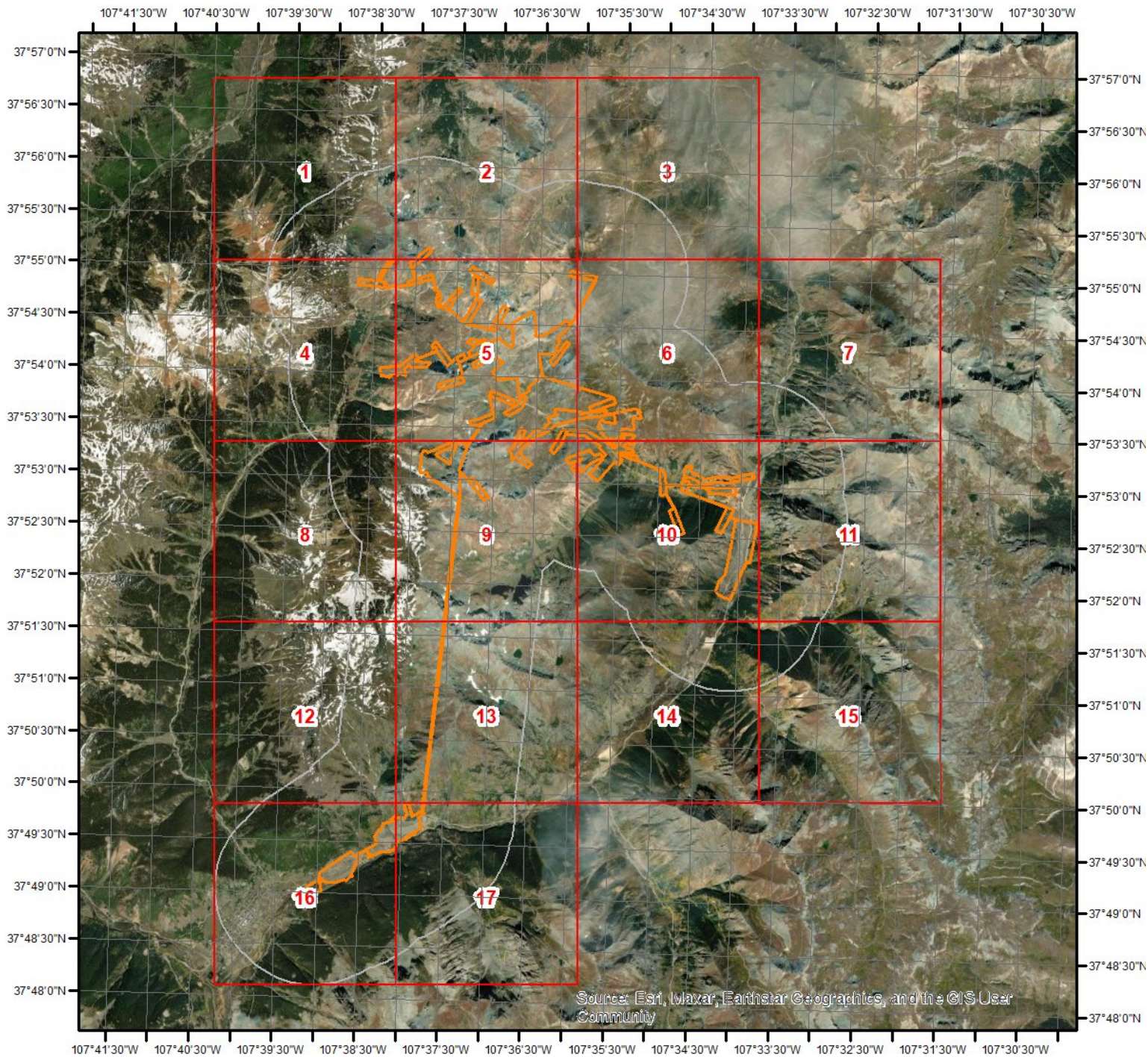
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland

- Freshwater Pond
- Lake
- Other
- Riverine

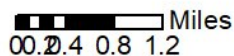




Hydrologic Information

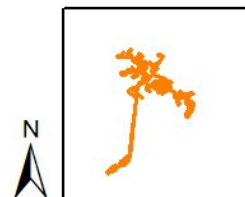


Flood Hazard Zones



This map shows FEMA flood hazard zones. FIRM panels are shown to the right, and blank indicates no data is available.

	A		AO		X
	A99		V		OPEN WATER
	AE		VE		NOT POPULATED
	AH		D		AREA NOT INCLUDED



Quadrangle(s): Engineer Mountain,CO; Handies Peak,CO; Howardsville,CO; Ironton,CO; Ophir,CO; Pole



## Hydrologic Information

The Wetland Type map shows wetland existence overlaid on an aerial imagery. The Flood Hazard Zones map shows FEMA flood hazard zones overlaid on an aerial imagery. Relevant FIRM panels and detailed zone information is provided below. For detailed Zone descriptions please click the link: <https://floodadvocate.com/fema-zone-definitions>

No records found for the project property or surrounding properties.

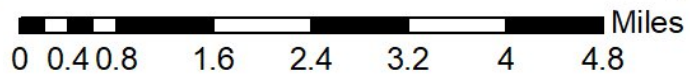


Geologic Information

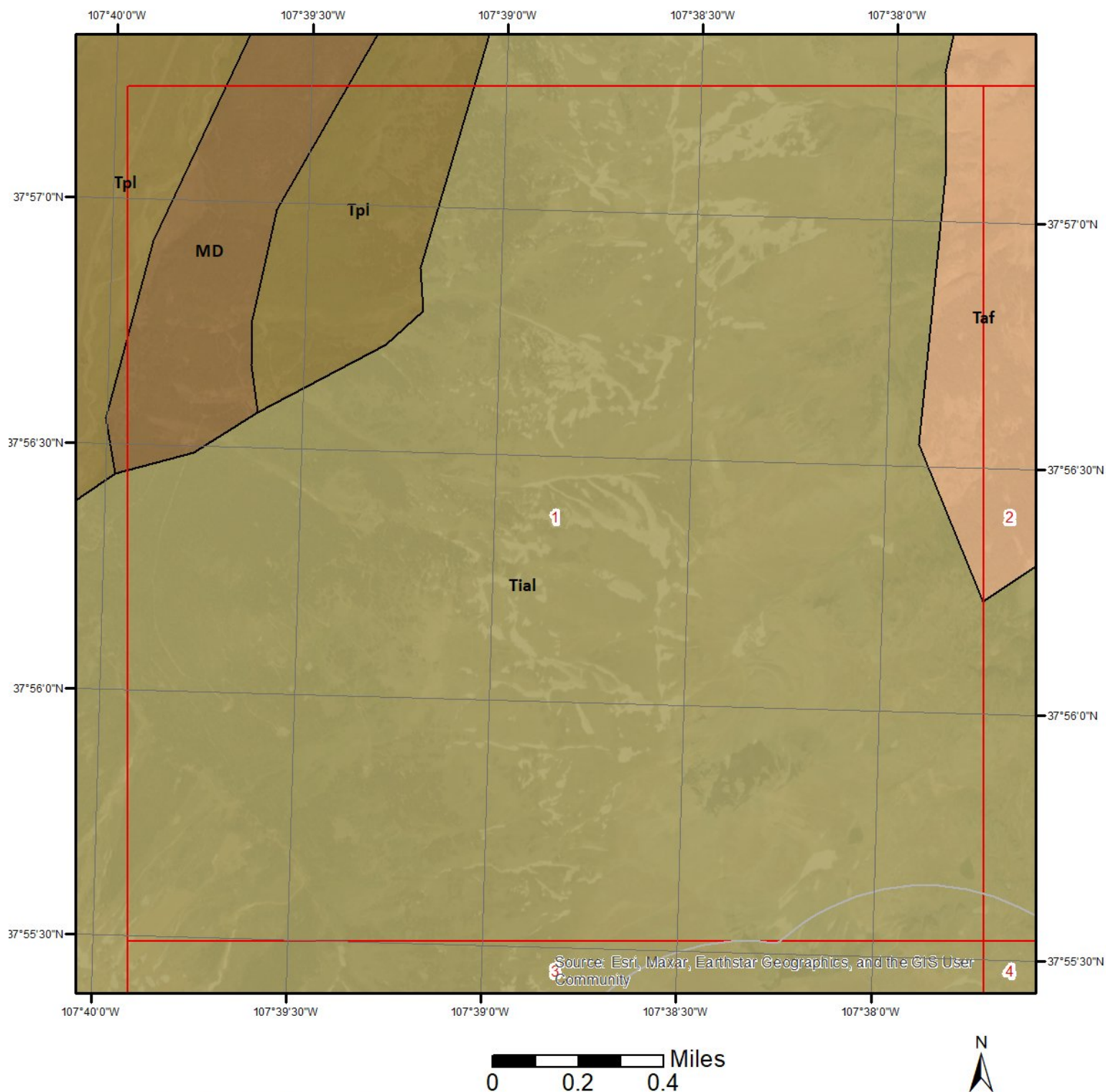


Geologic Units

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.



Geologic Information



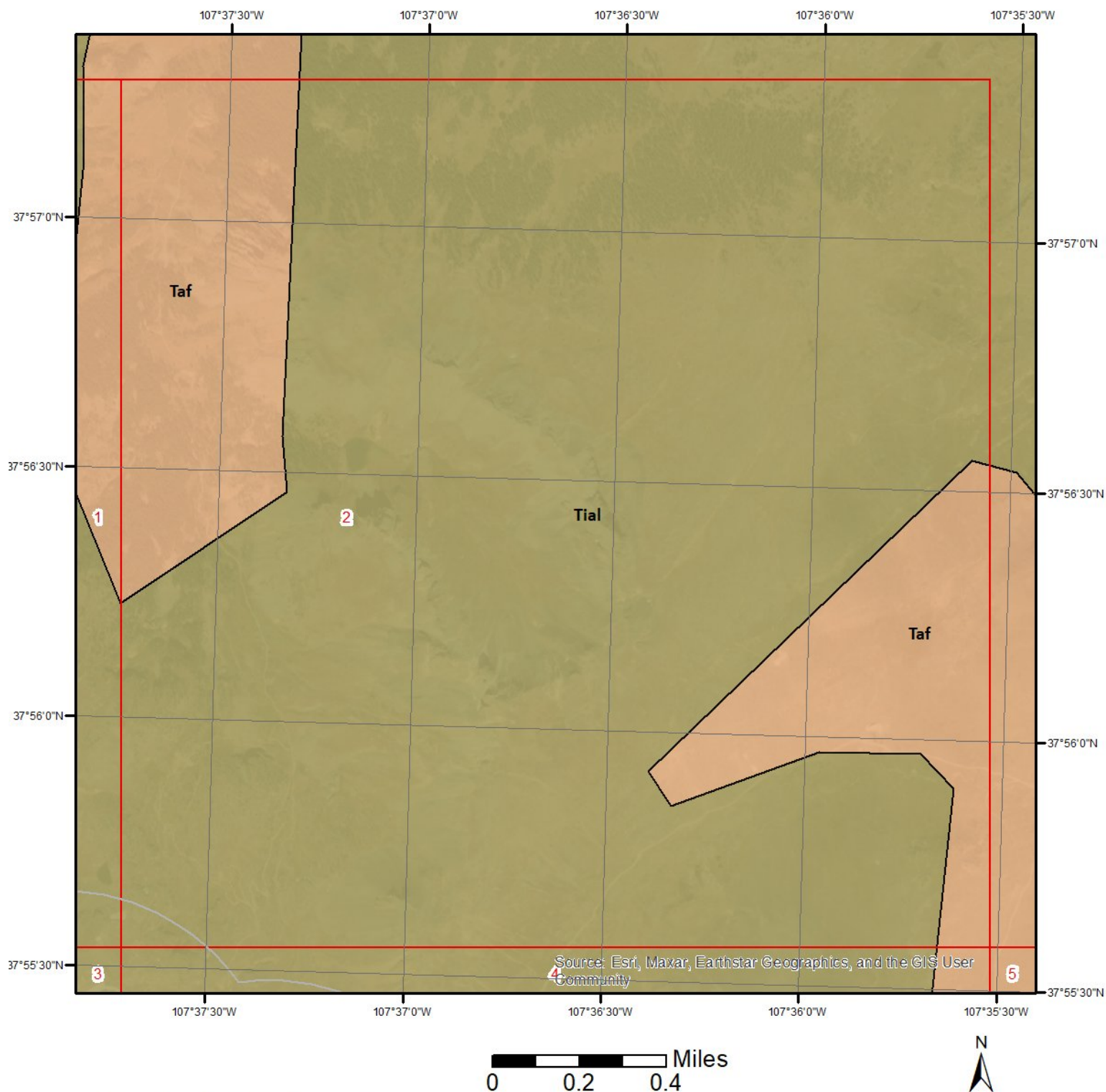
Geologic Units - Page 1

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.





Geologic Information

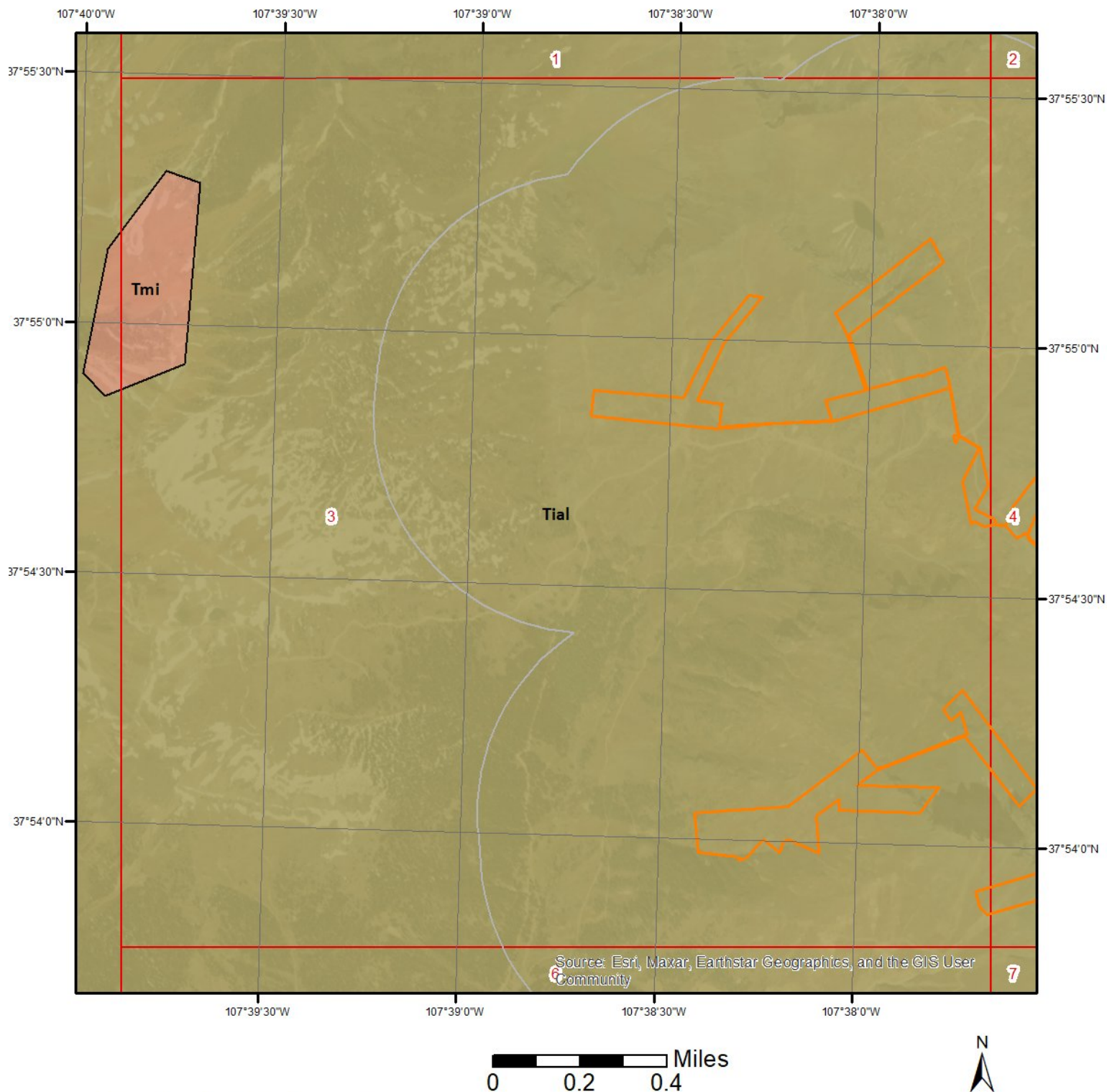


Geologic Units - Page 2

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.



**Geologic Information**

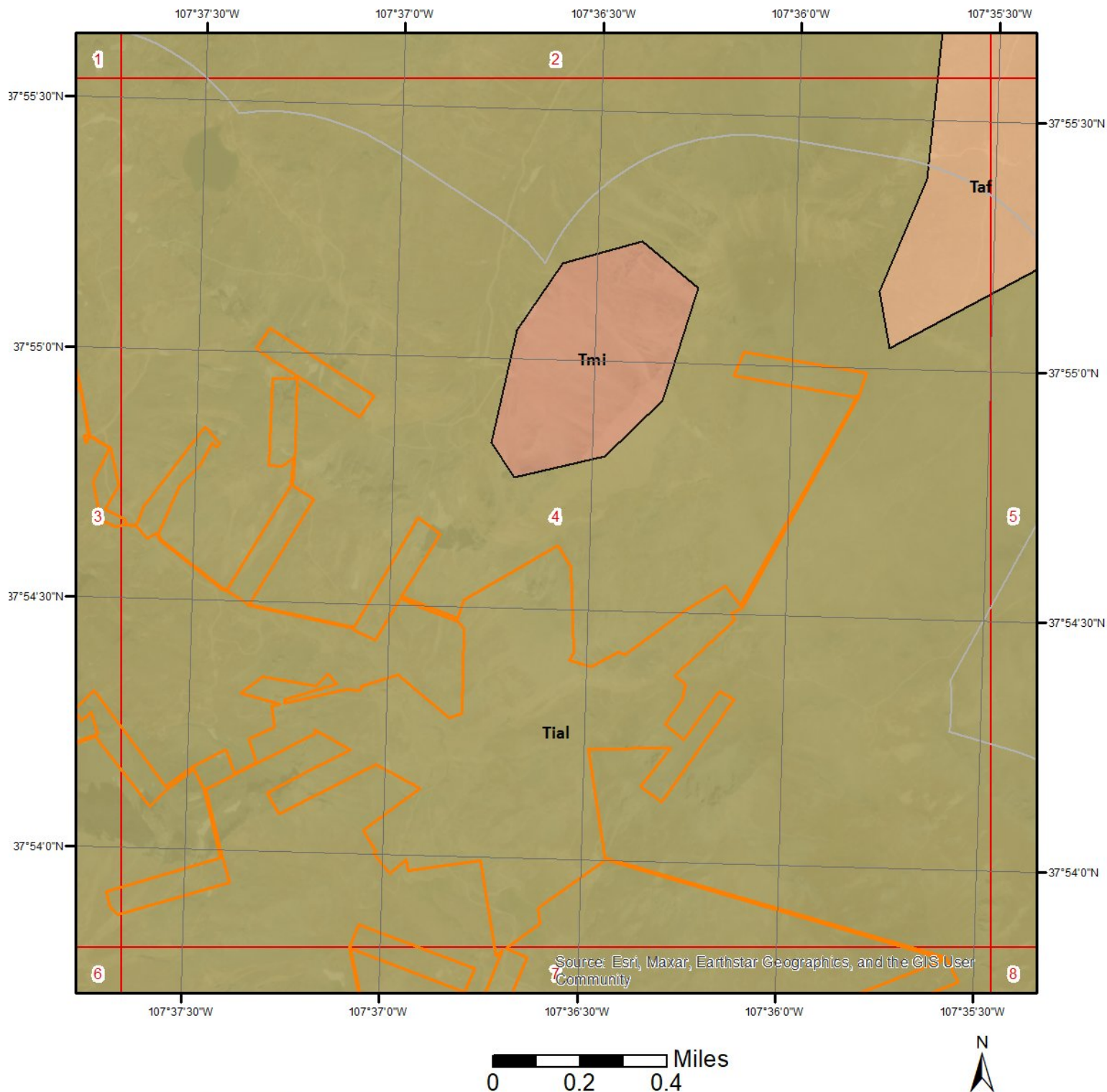


**Geologic Units - Page 3**

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.



**Geologic Information**



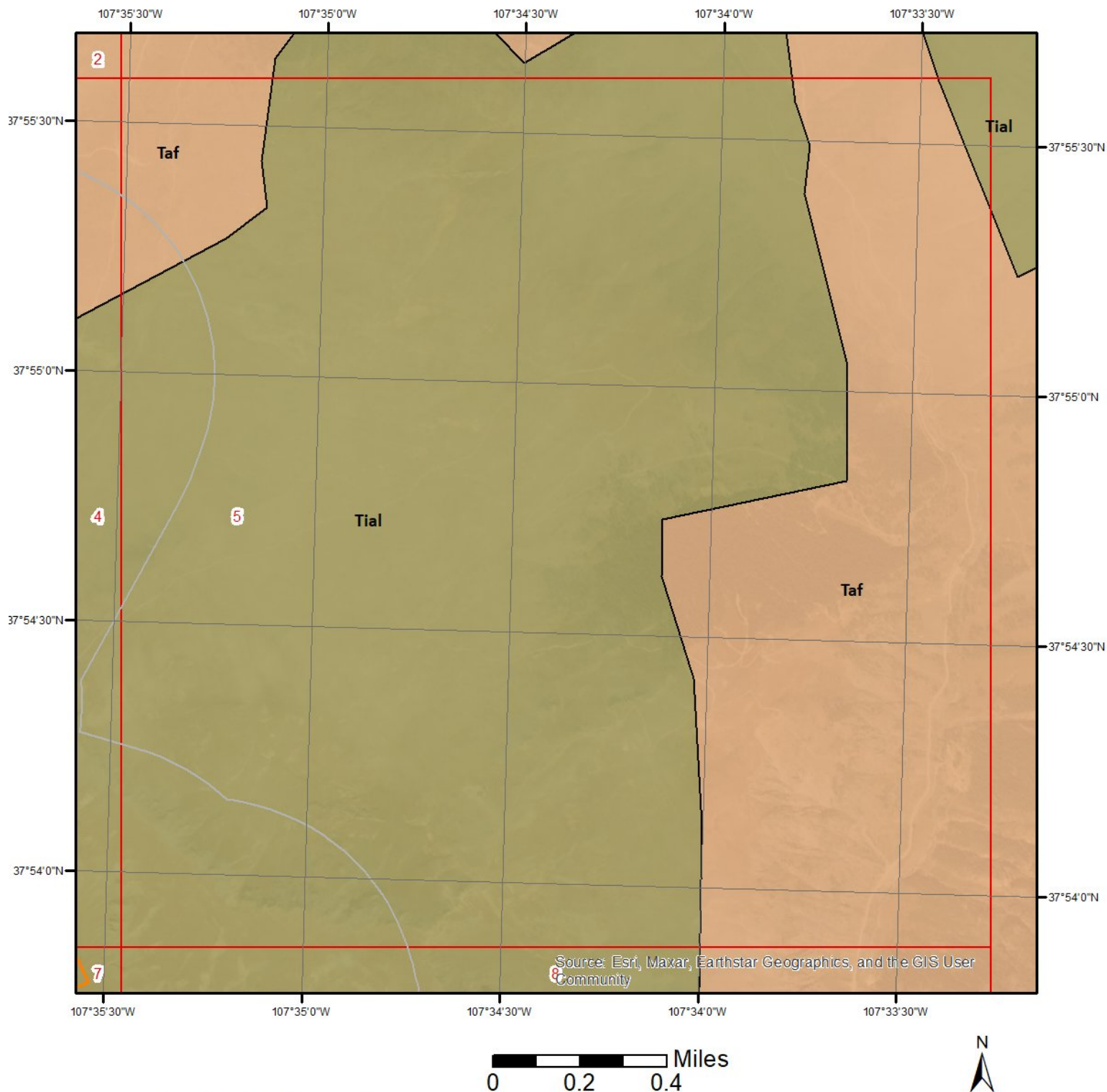
**Geologic Units - Page 4**

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.





Geologic Information

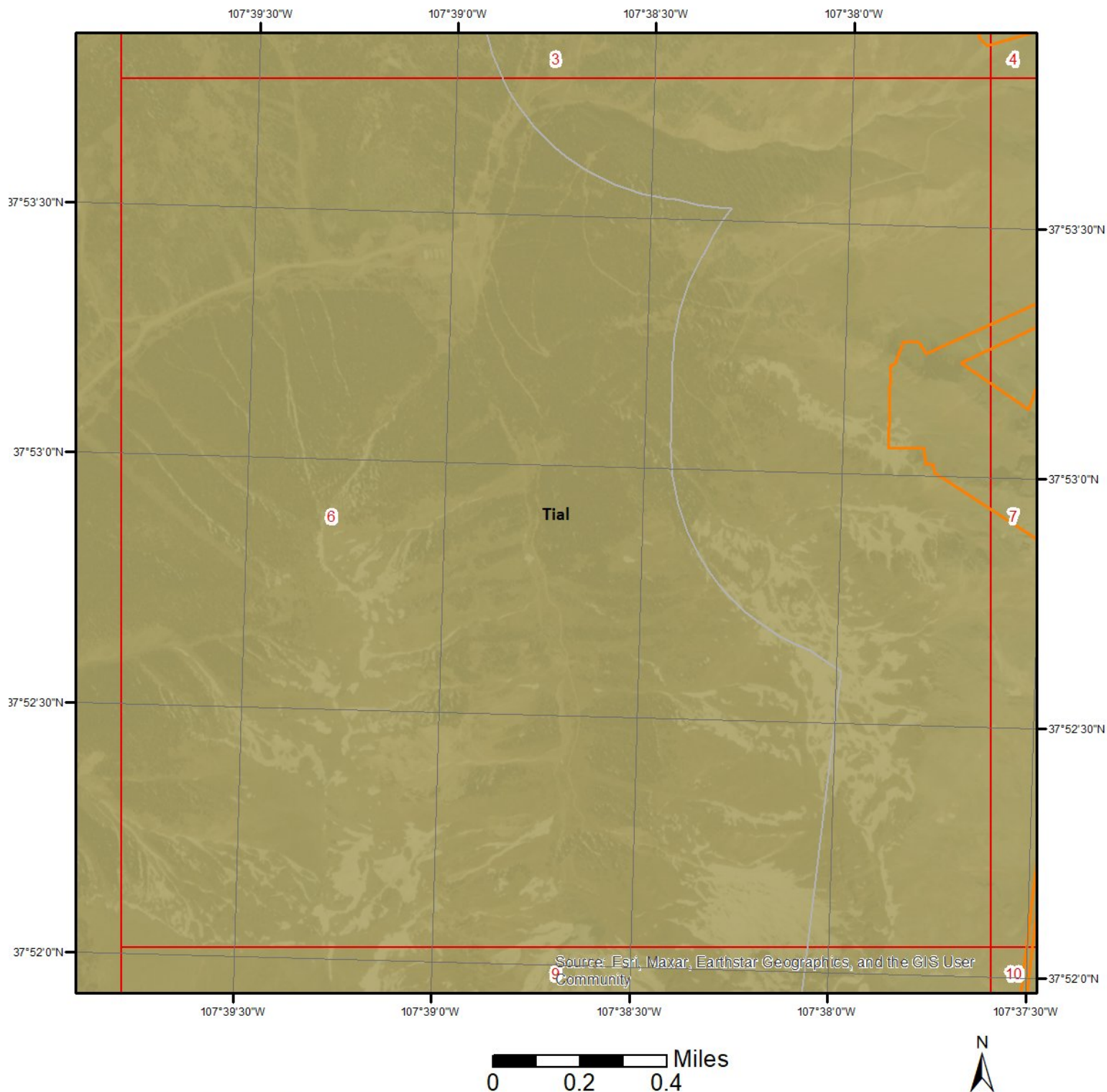


Geologic Units - Page 5

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.



**Geologic Information**



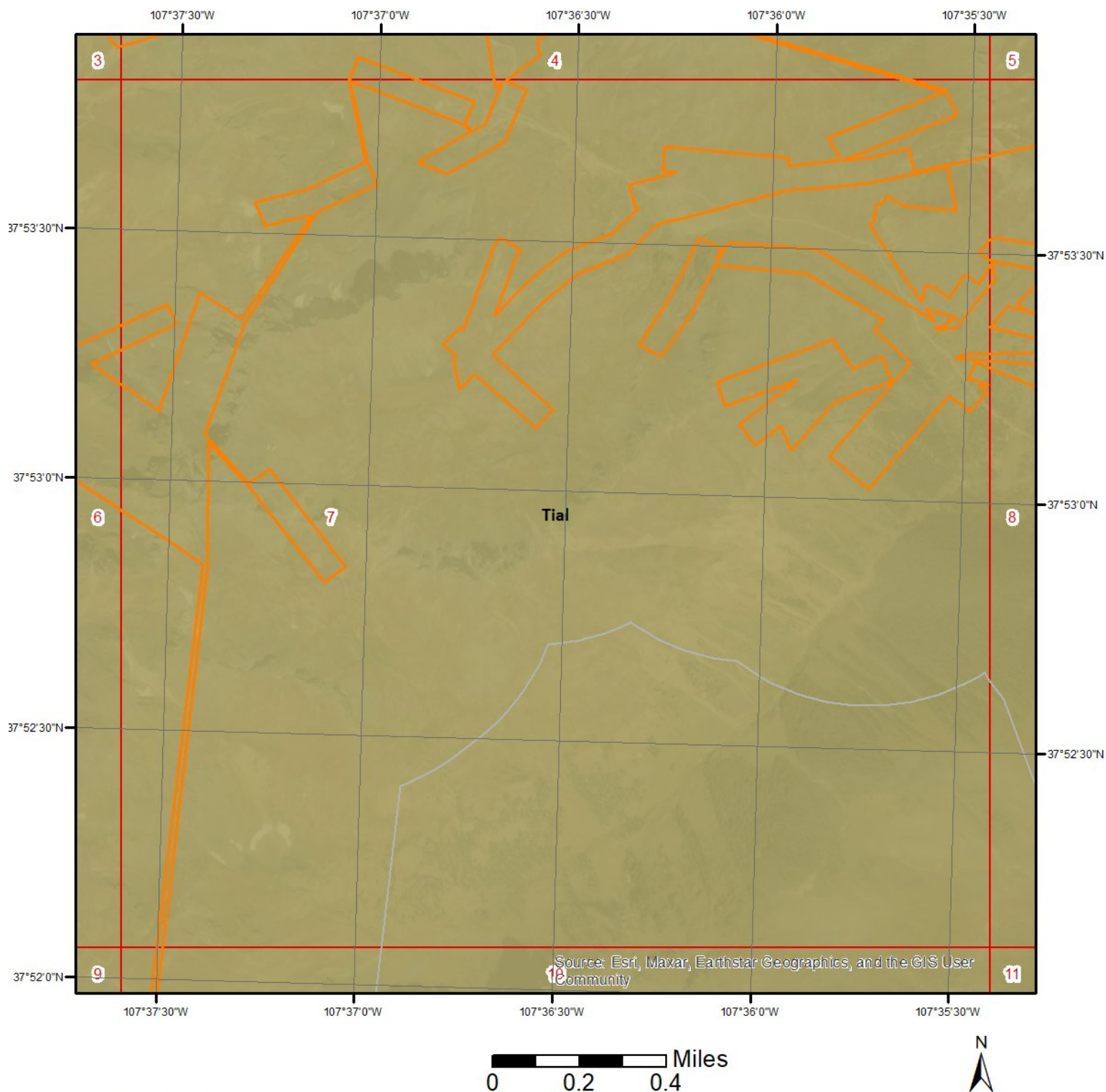
**Geologic Units - Page 6**

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.





**Geologic Information**

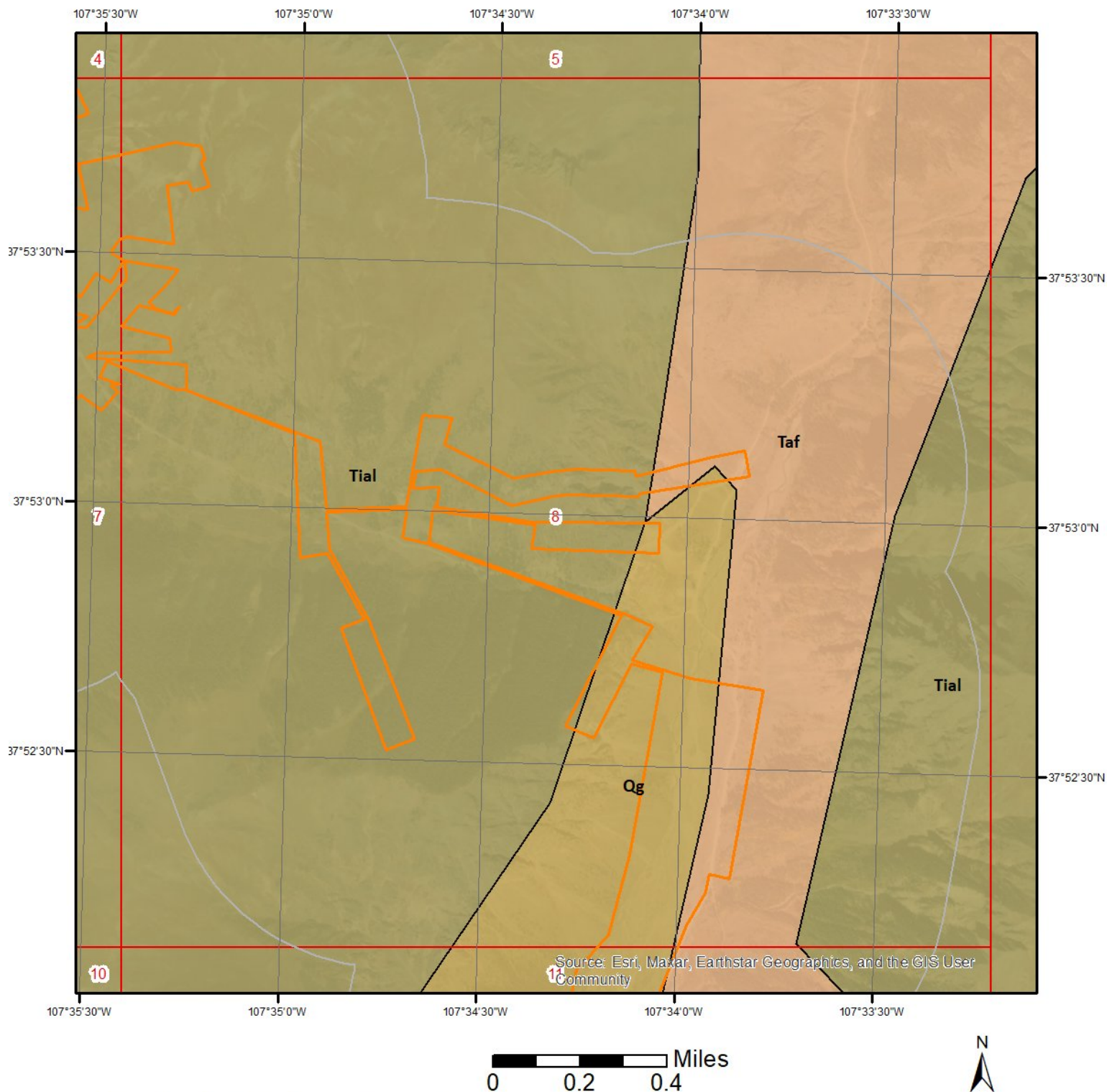


**Geologic Units - Page 7**

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.



**Geologic Information**



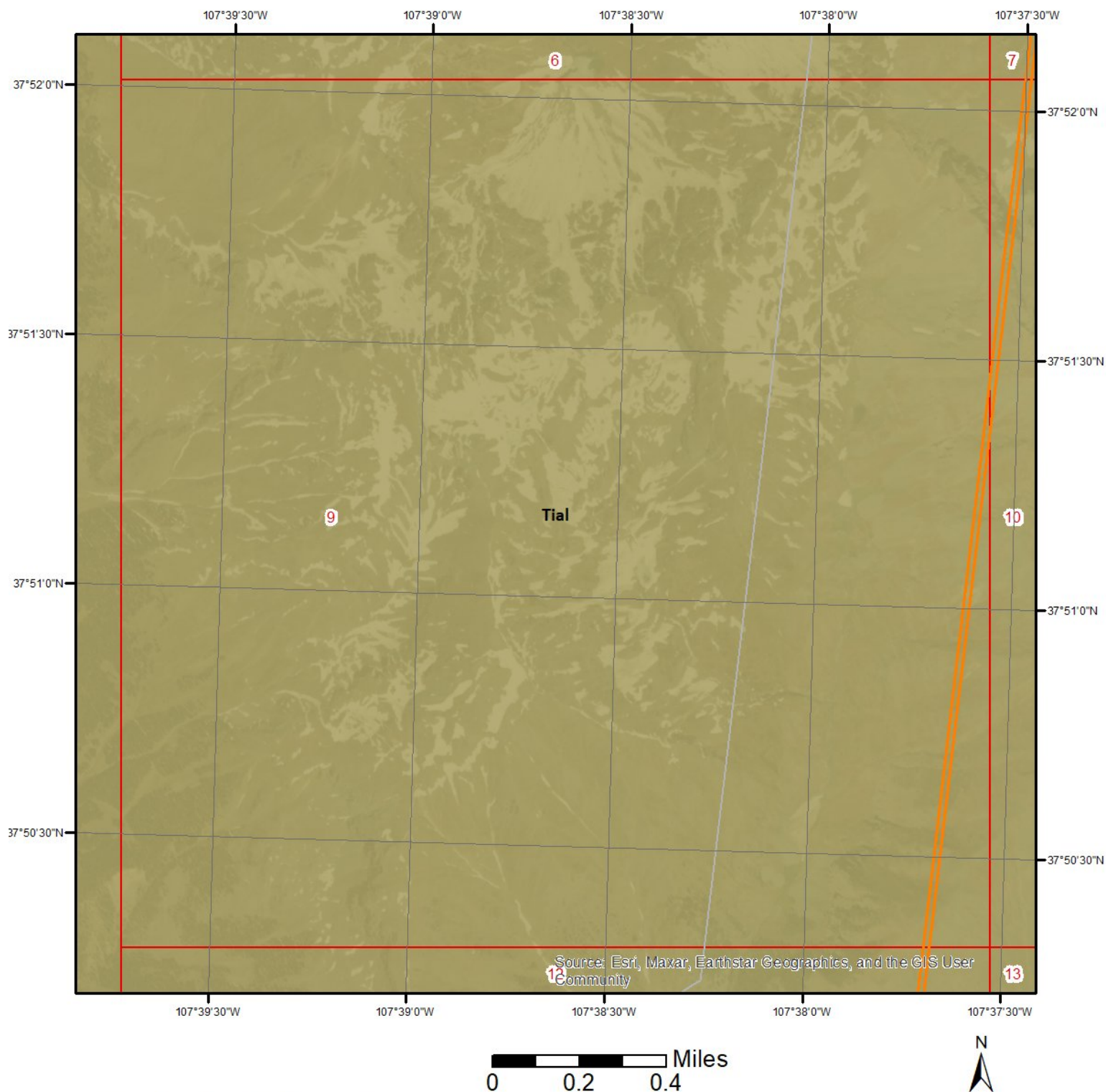
**Geologic Units - Page 8**

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.





Geologic Information

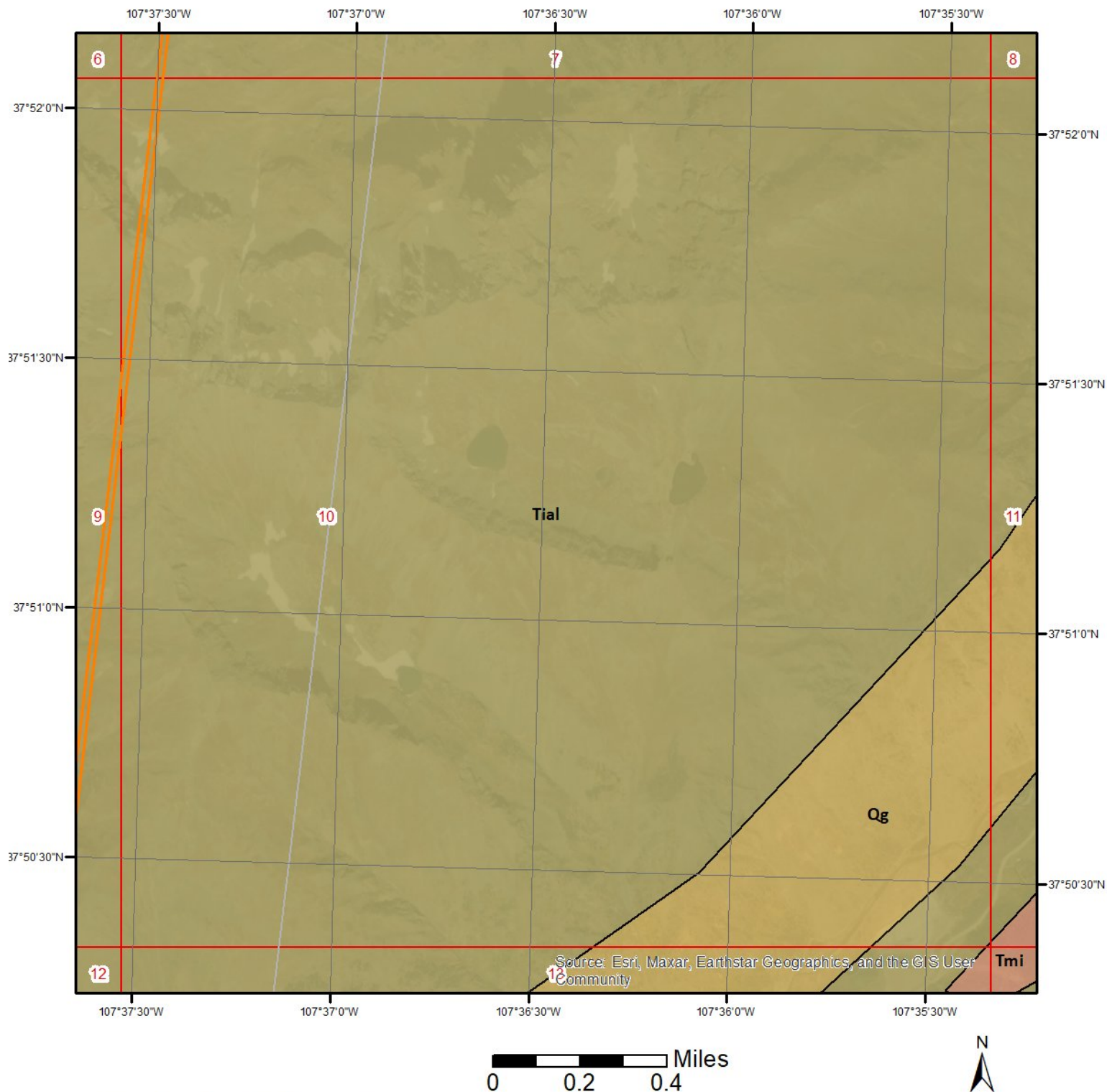


Geologic Units - Page 9

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.



Geologic Information

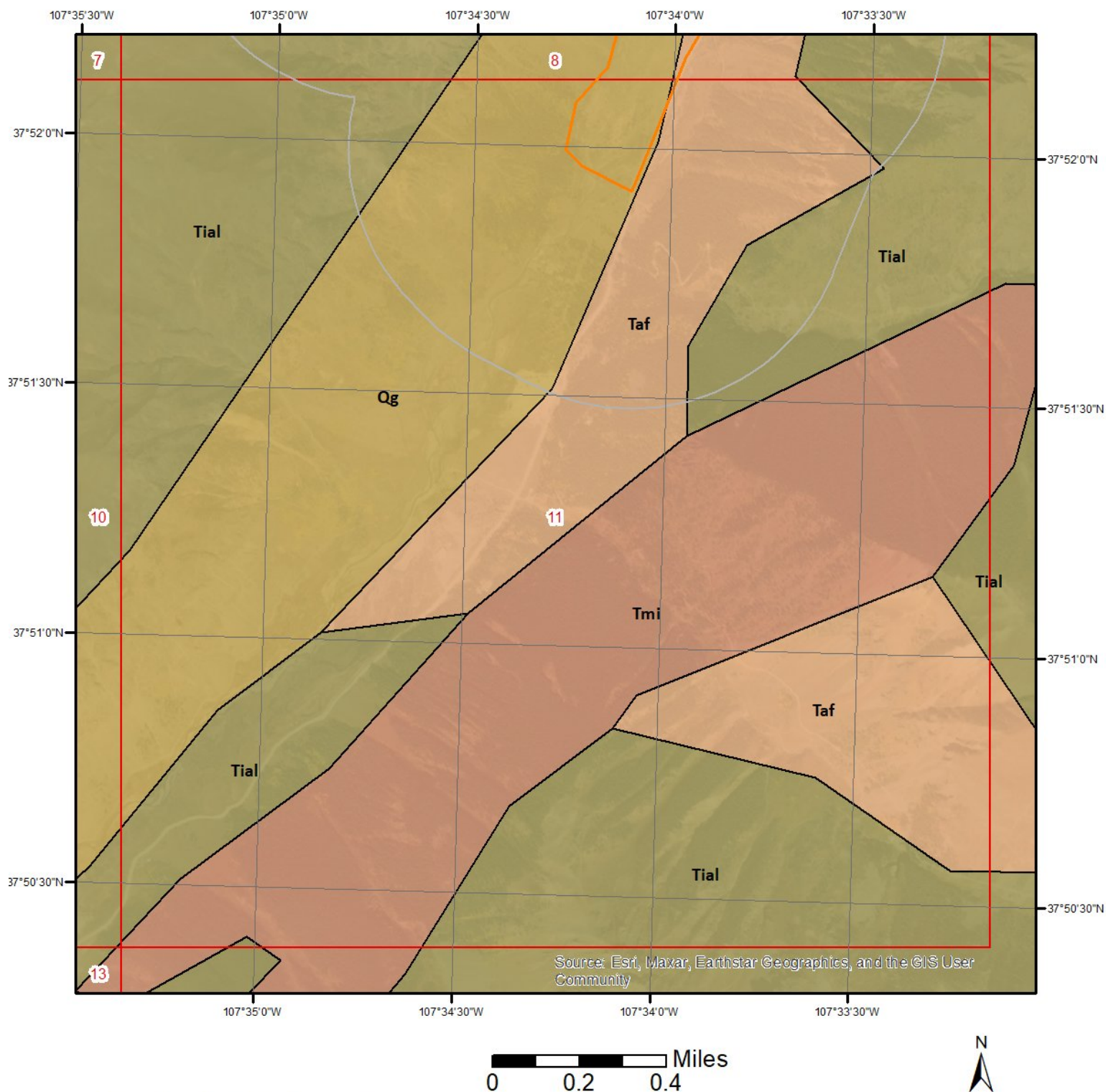


Geologic Units - Page 10

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.



Geologic Information



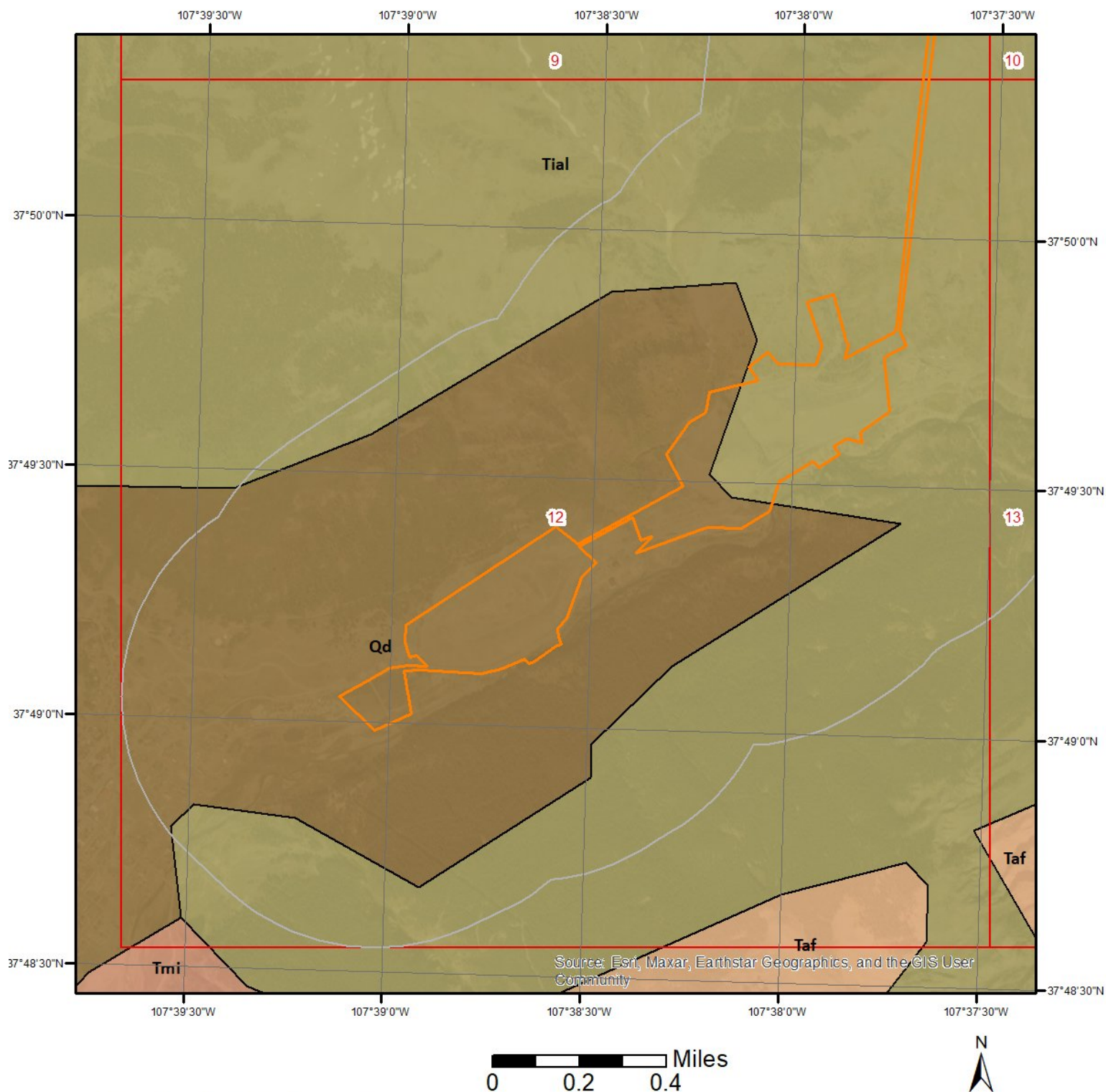
Geologic Units - Page 11

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.





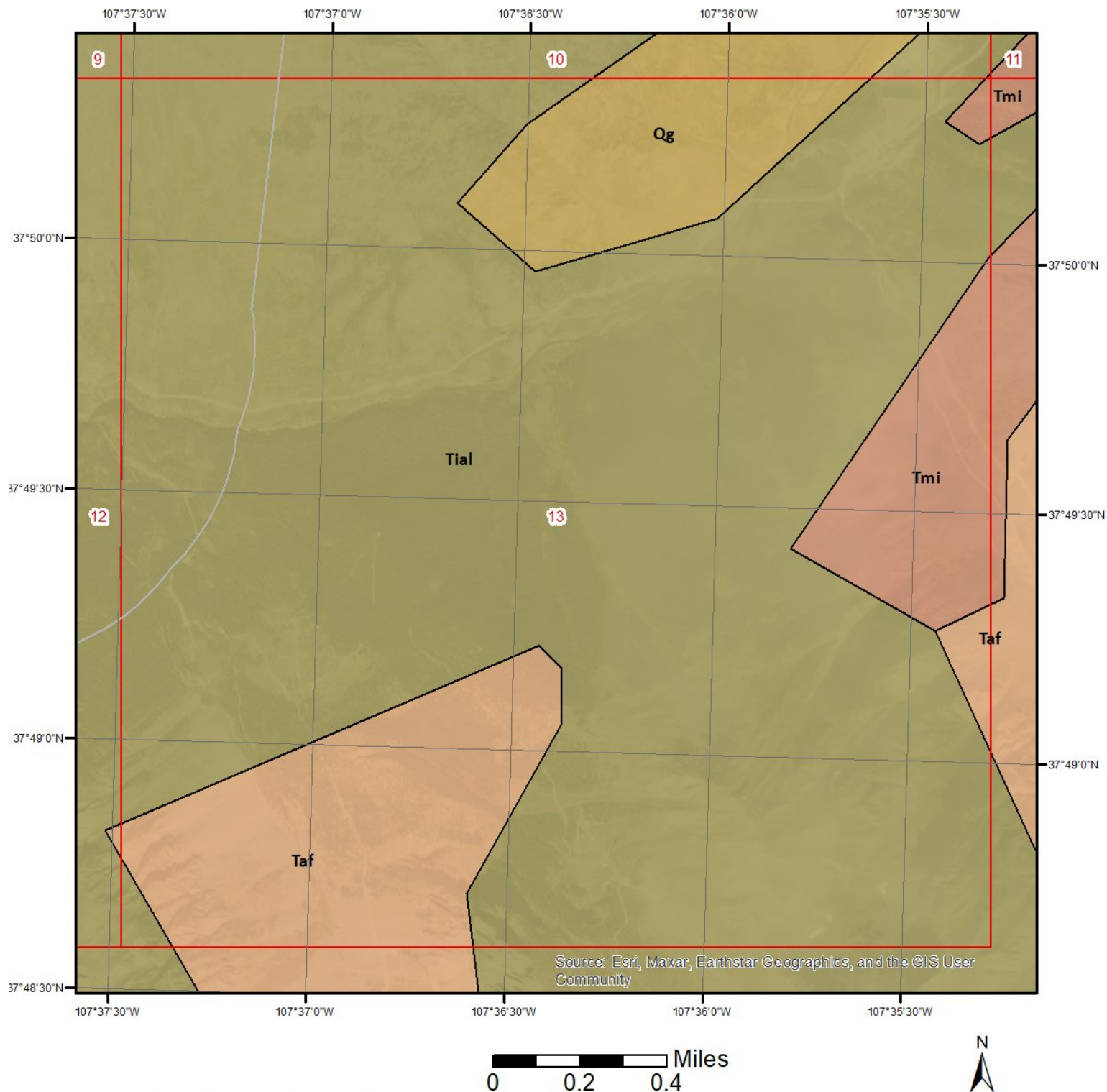
Geologic Information



Geologic Units - Page 12

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.





Geologic Units - Page 13

This maps shows geologic units in the area. Please refer to the report for detailed descriptions.



## Geologic Information

The previous page shows USGS geology information. Detailed information about each unit is provided below.

---

### Geologic Unit Tial

Unit Name:	Intra-ash flow andesitic lavas
Unit Age:	Phanerozoic | Cenozoic | Tertiary
Primary Rock Type:	andesite
Secondary Rock Type:	
Unit Description:	No description available.

---

### Geologic Unit Taf

Unit Name:	Ash-flow tuff of main volcanic sequence
Unit Age:	Phanerozoic | Cenozoic | Tertiary
Primary Rock Type:	ash-flow tuff
Secondary Rock Type:	
Unit Description:	Includes many named units

---

### Geologic Unit Tmi

Unit Name:	Middle Tertiary intrusive rocks
Unit Age:	Phanerozoic | Cenozoic | Tertiary
Primary Rock Type:	plutonic rock (phanerit
Secondary Rock Type:	
Unit Description:	Intermediate to felsic compositions

---

### Geologic Unit Tial

Unit Name:	Intra-ash flow andesitic lavas
Unit Age:	Phanerozoic | Cenozoic | Tertiary
Primary Rock Type:	andesite
Secondary Rock Type:	
Unit Description:	No description available.

---

### Geologic Unit Qg

Unit Name:	Gravels and alluviums
Unit Age:	Phanerozoic | Cenozoic | Quaternary
Primary Rock Type:	gravel
Secondary Rock Type:	alluvium
Unit Description:	Includes Broadway and Louviers Alluviums

---

### Geologic Unit Qd

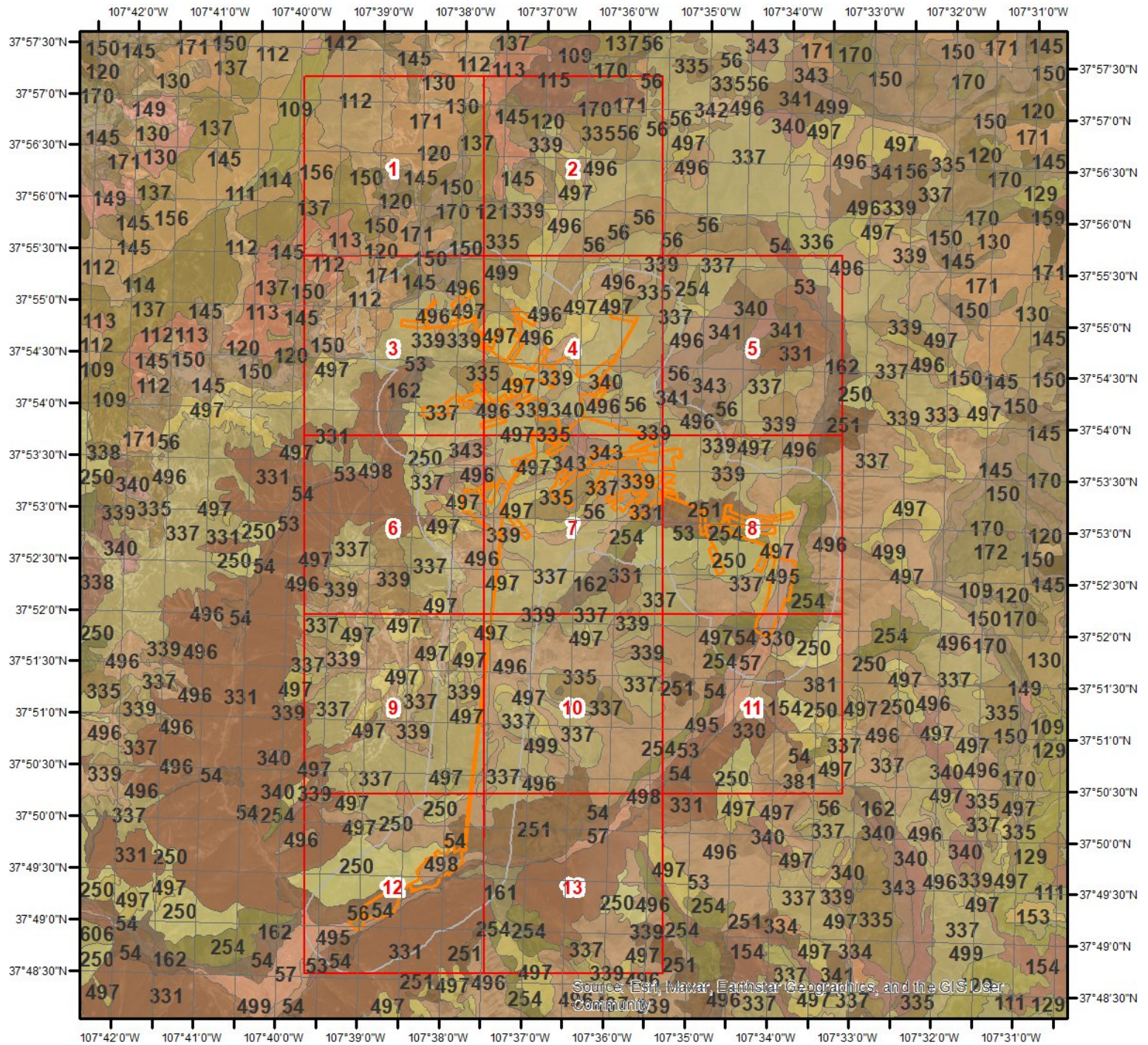
Unit Name:	Glacial drift
------------	---------------

## Geologic Information

Unit Age:	Phanerozoic | Cenozoic | Quaternary
Primary Rock Type:	glacial drift
Secondary Rock Type:	
Unit Description:	Includes some unclassified glacial deposits



## Soil Information



### SSURGO Soils

0 0.2 0.4 0.8 1.2 1.6 2 2.4 Miles

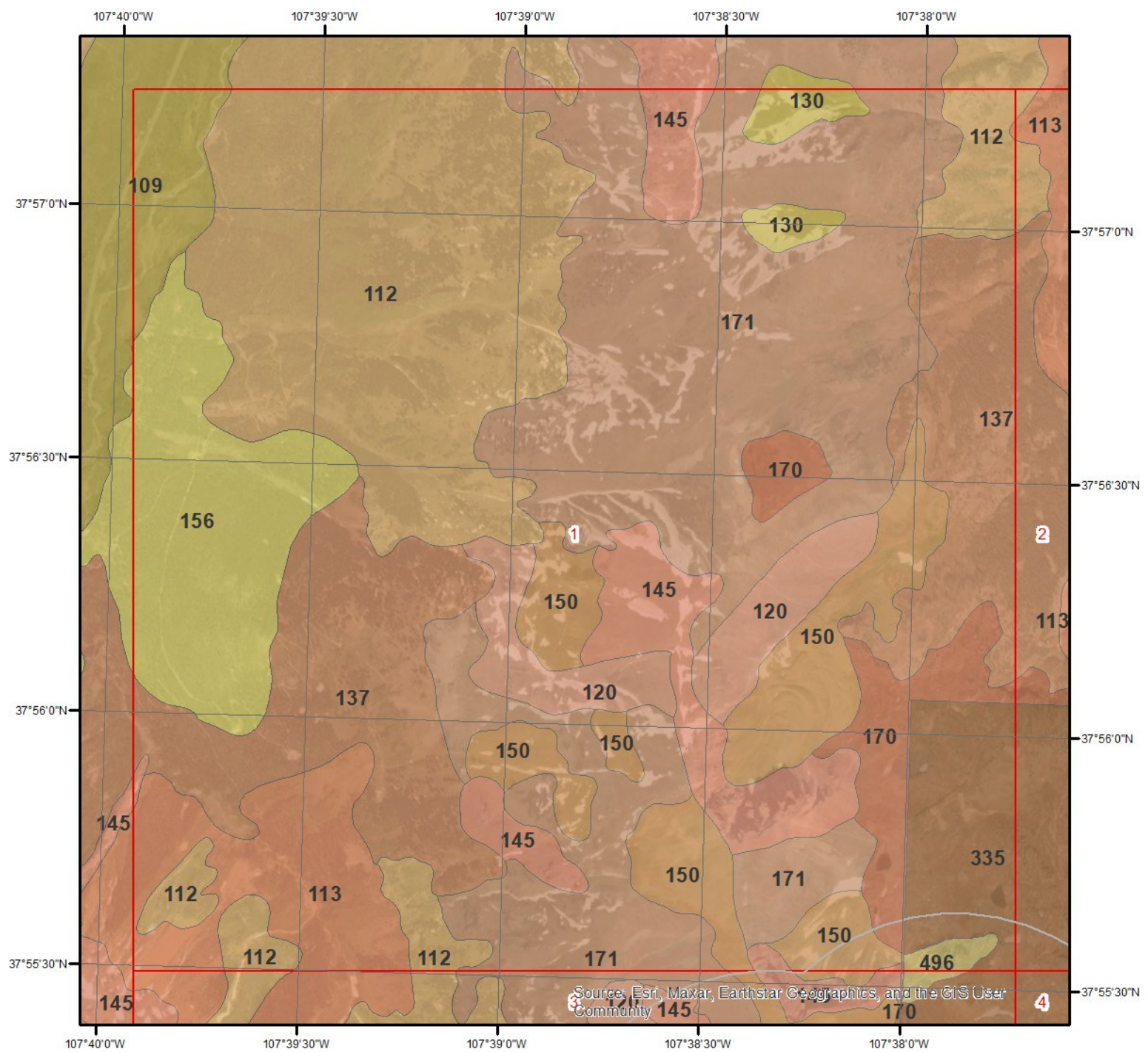


This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.





Soil Information



Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

SSURGO Soils - Page 1

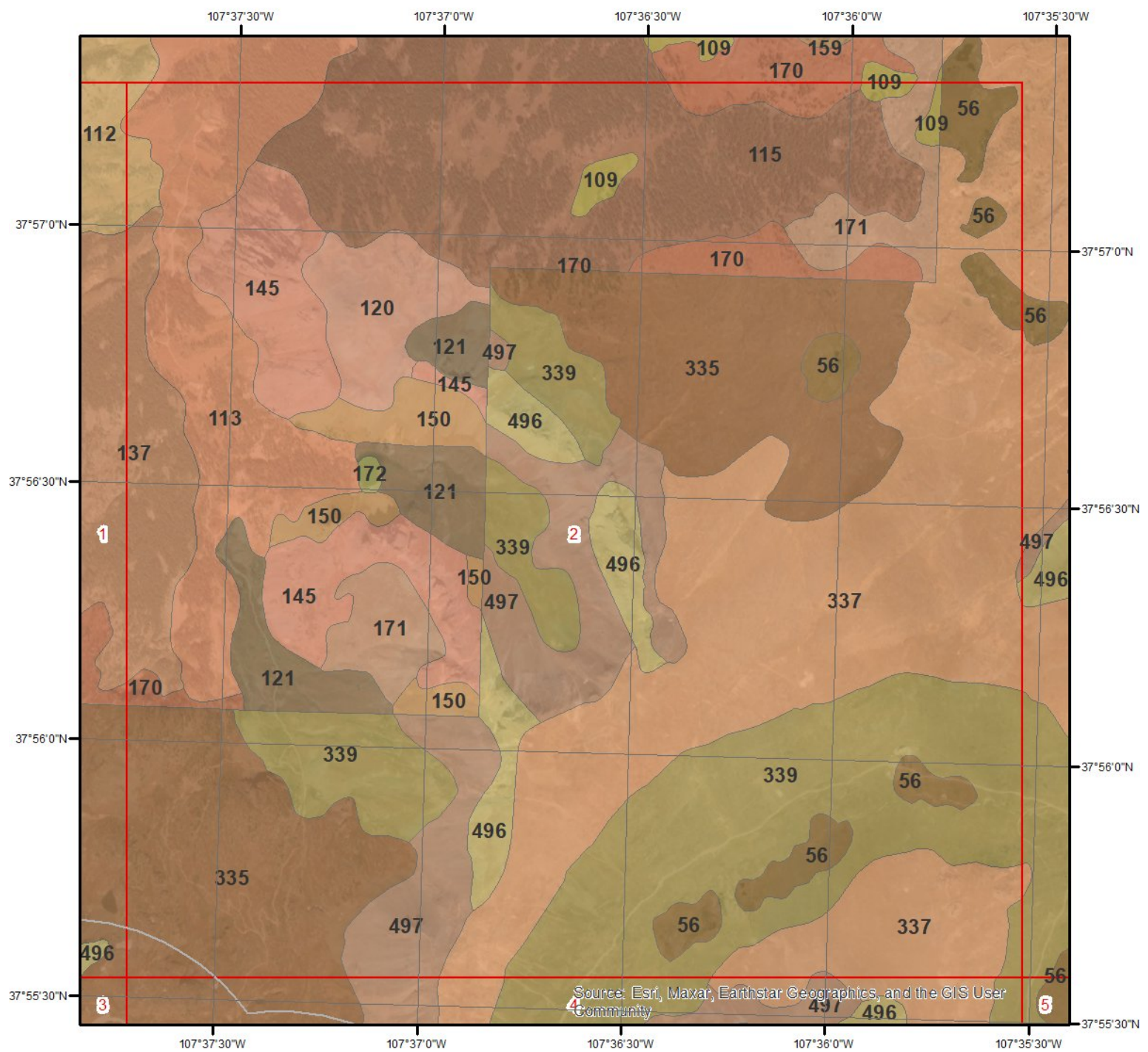
0 0.2 0.4 Miles



This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.



Soil Information



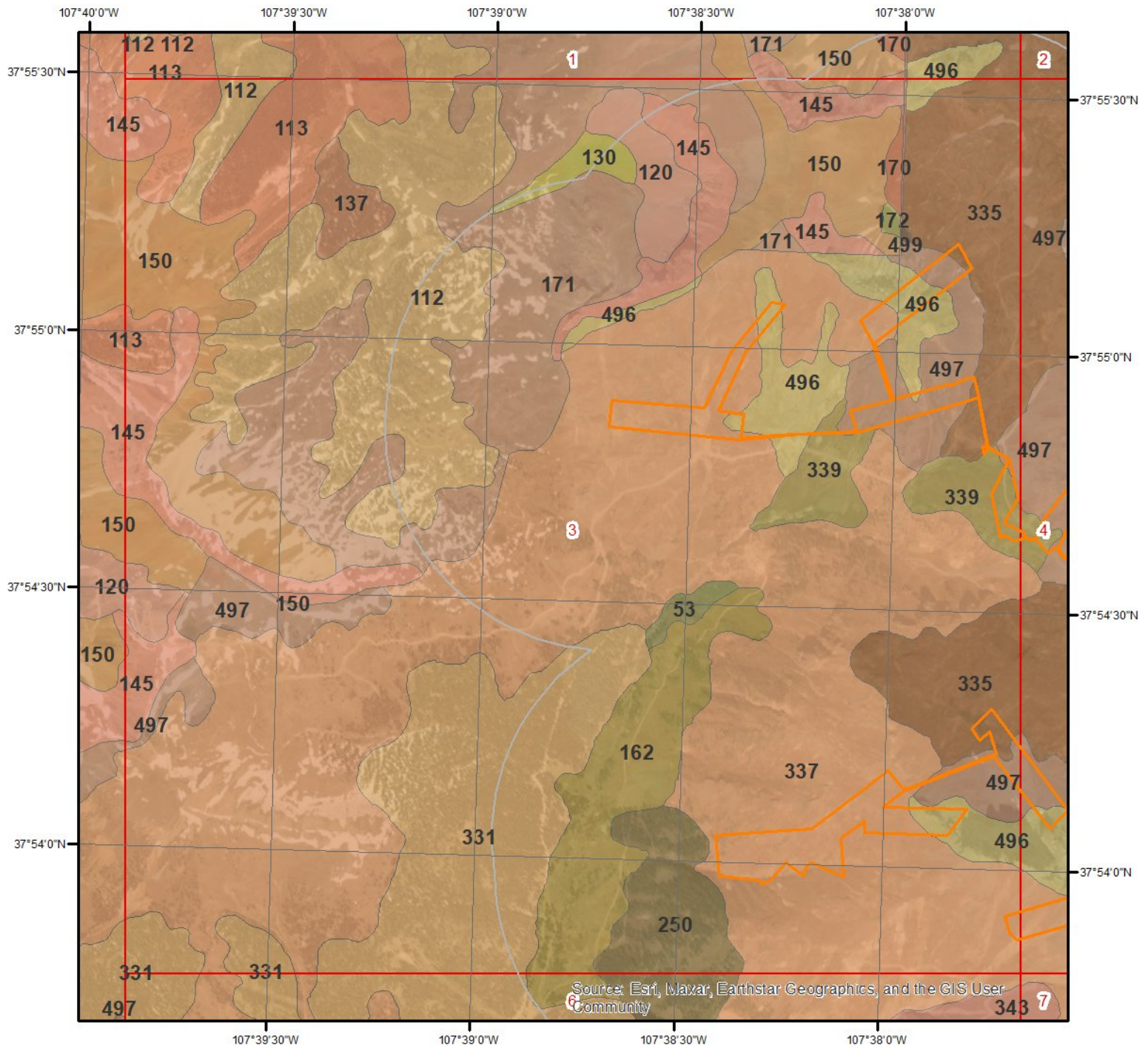
SSURGO Soils - Page 2

This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.





## Soil Information



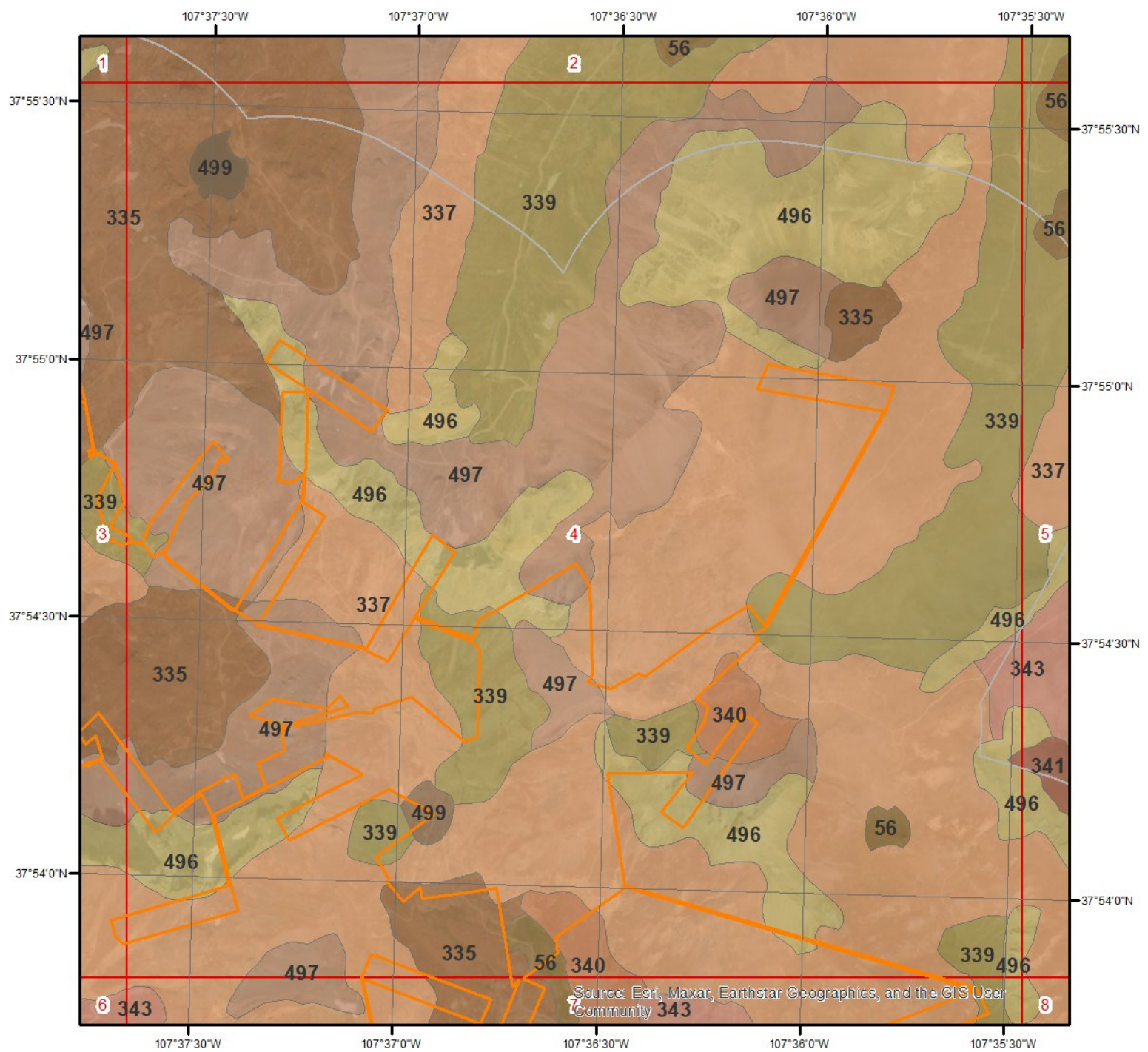
SSURGO Soils - Page 3

This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.





Soil Information

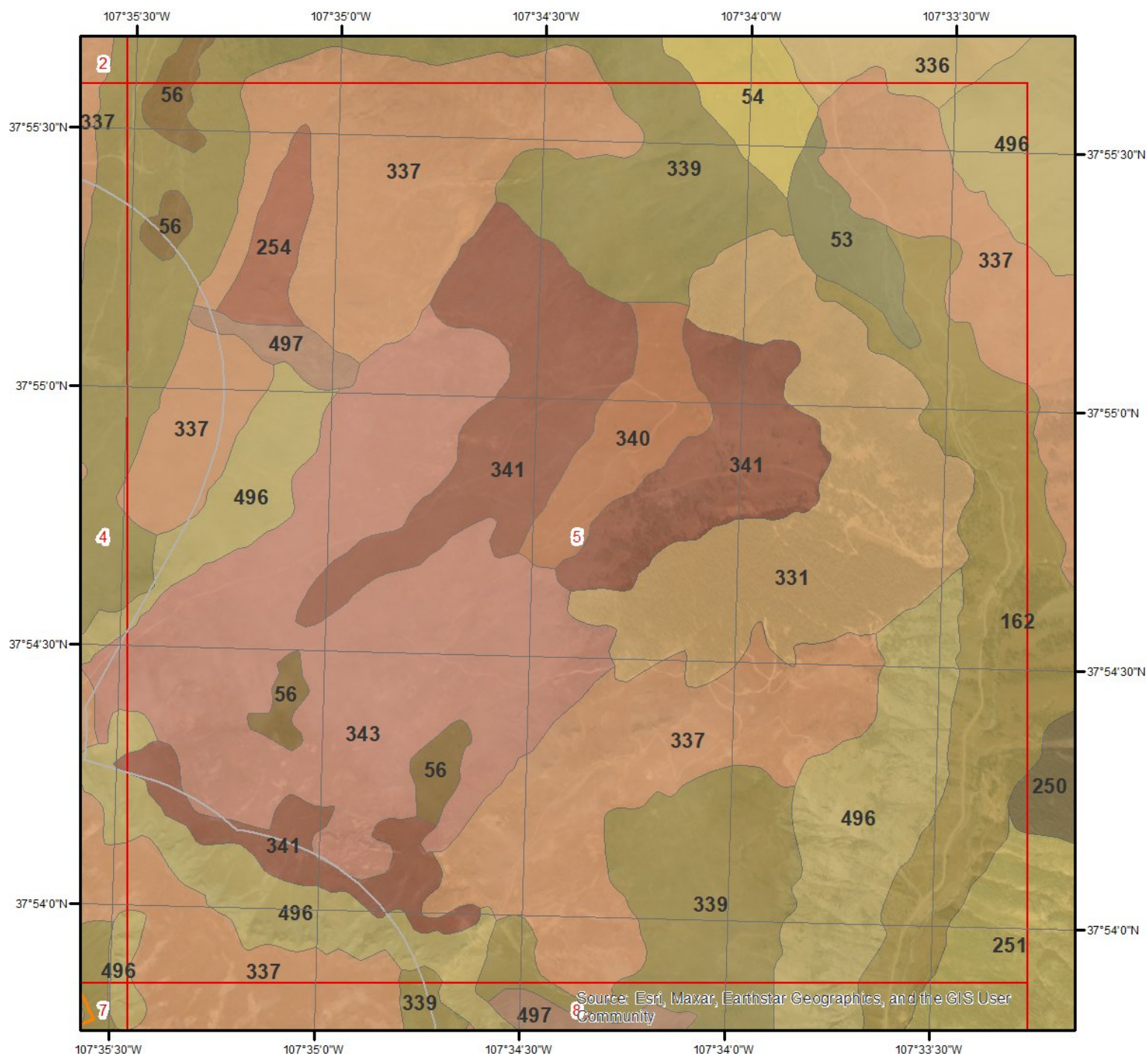


SSURGO Soils - Page 4

This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.



Soil Information



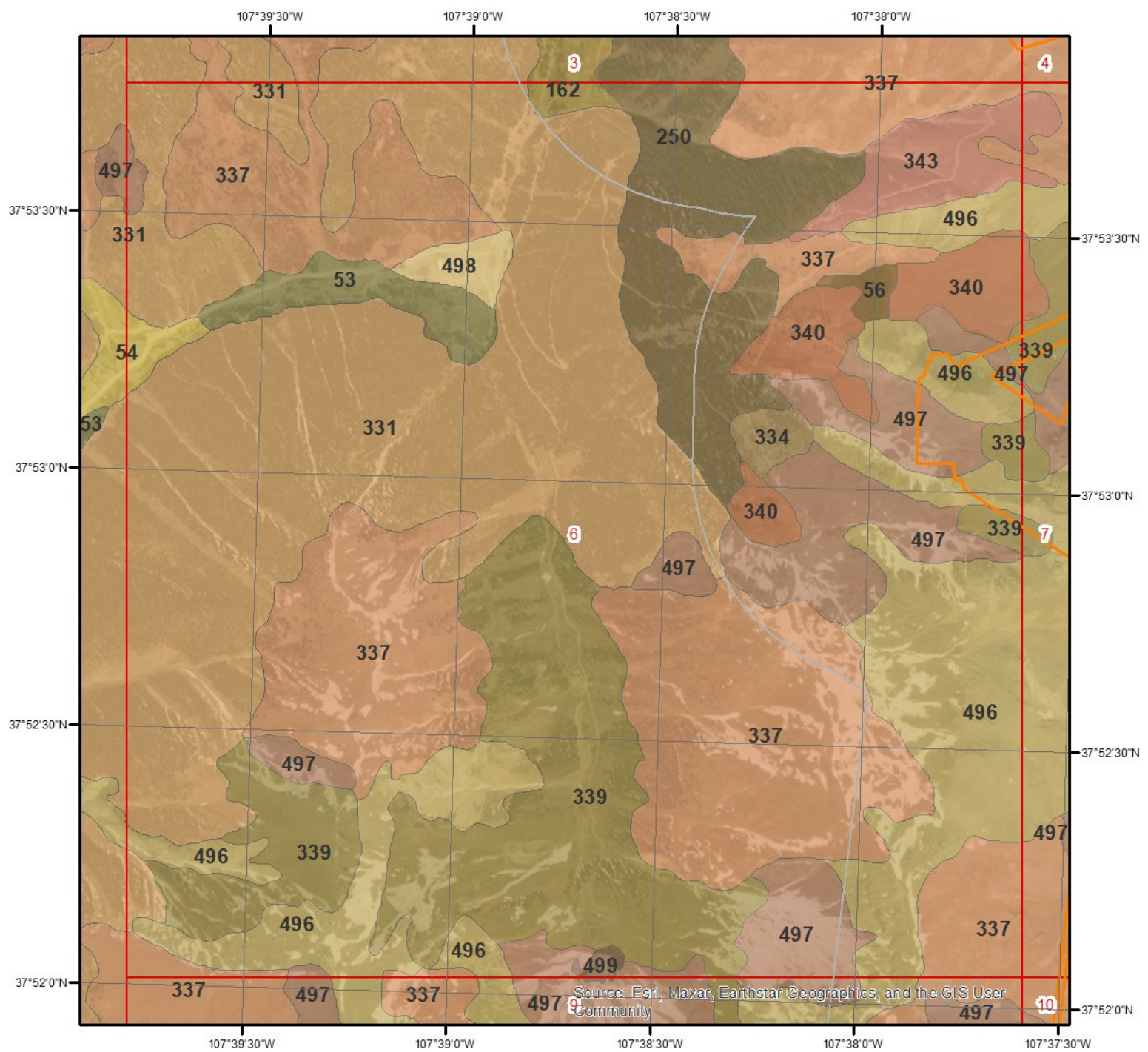
SSURGO Soils - Page 5

This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.

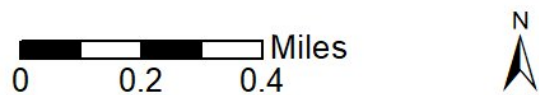




Soil Information



SSURGO Soils - Page 6

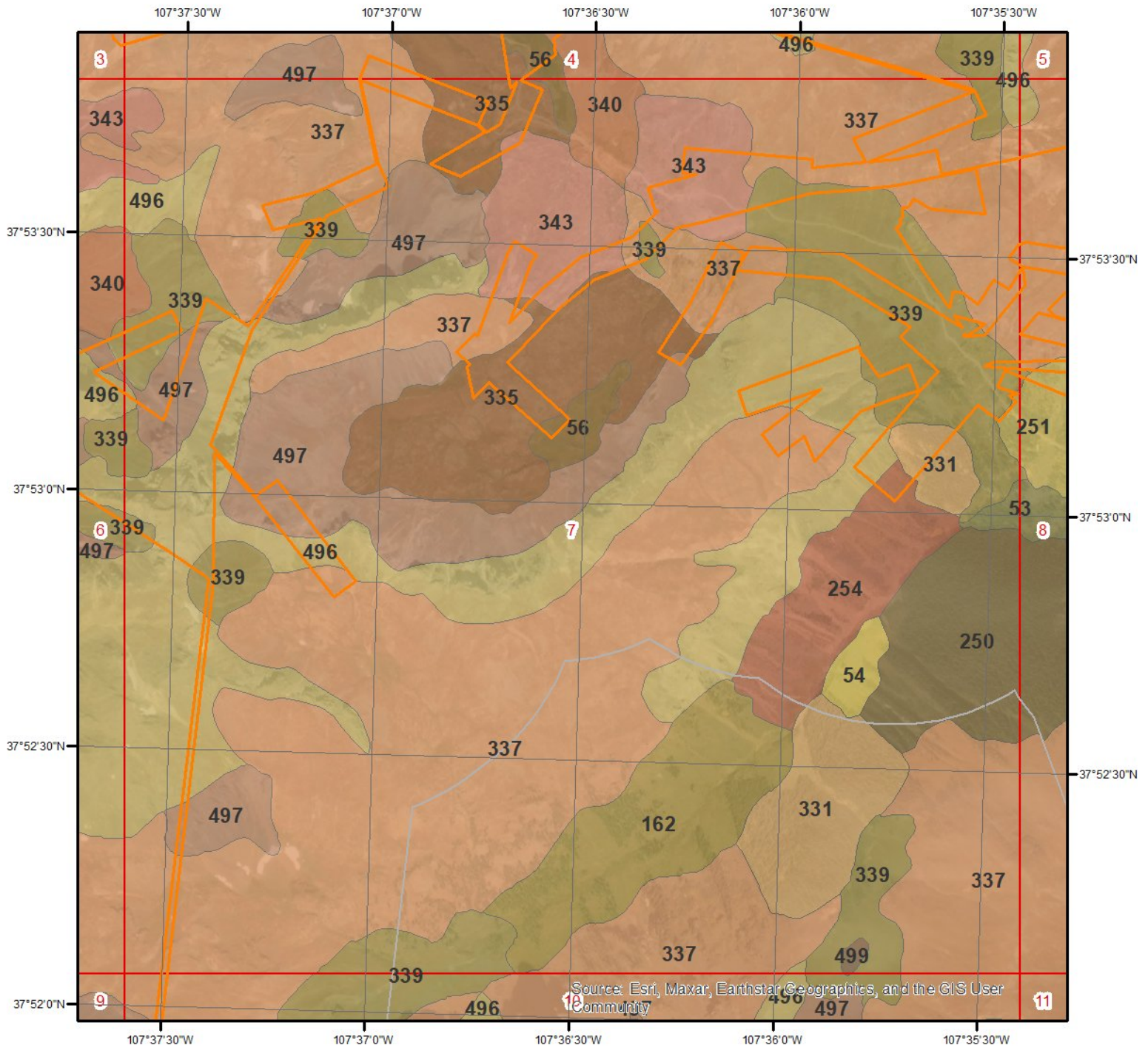


This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.





## Soil Information



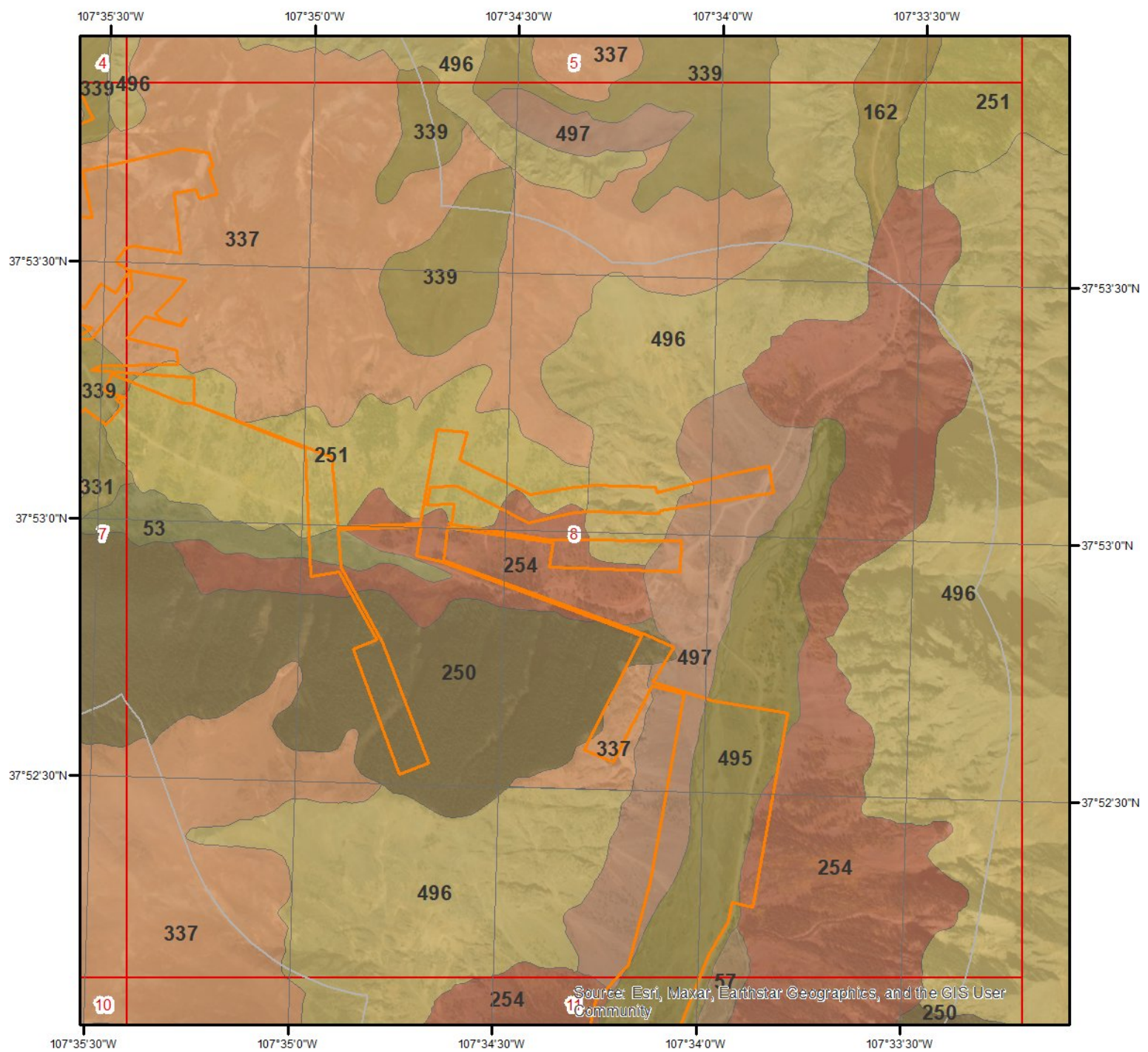
SSURGO Soils - Page 7

This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.





Soil Information



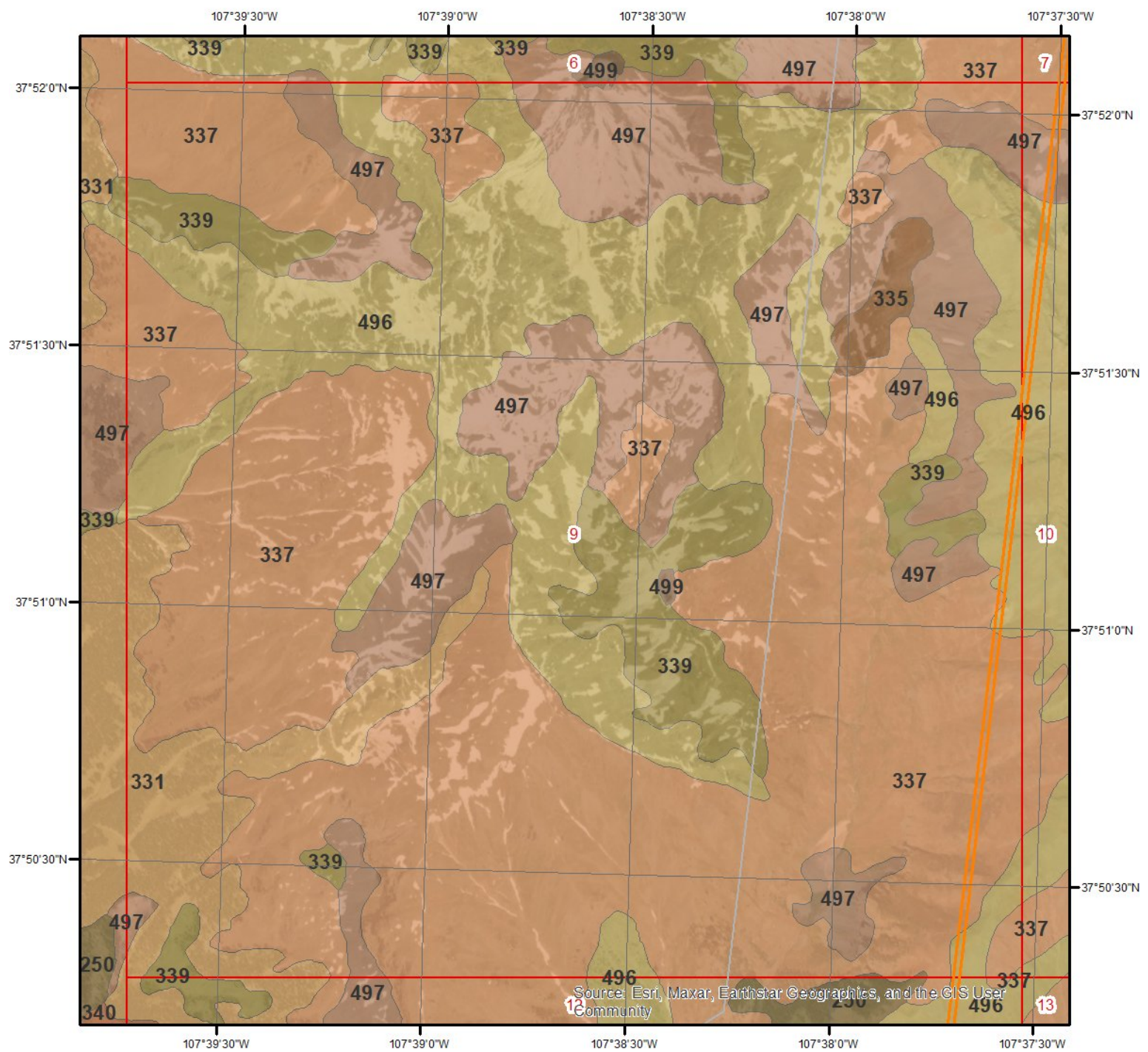
SSURGO Soils - Page 8

This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.

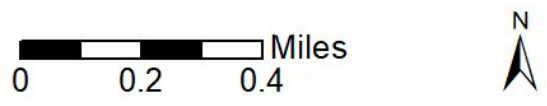




Soil Information



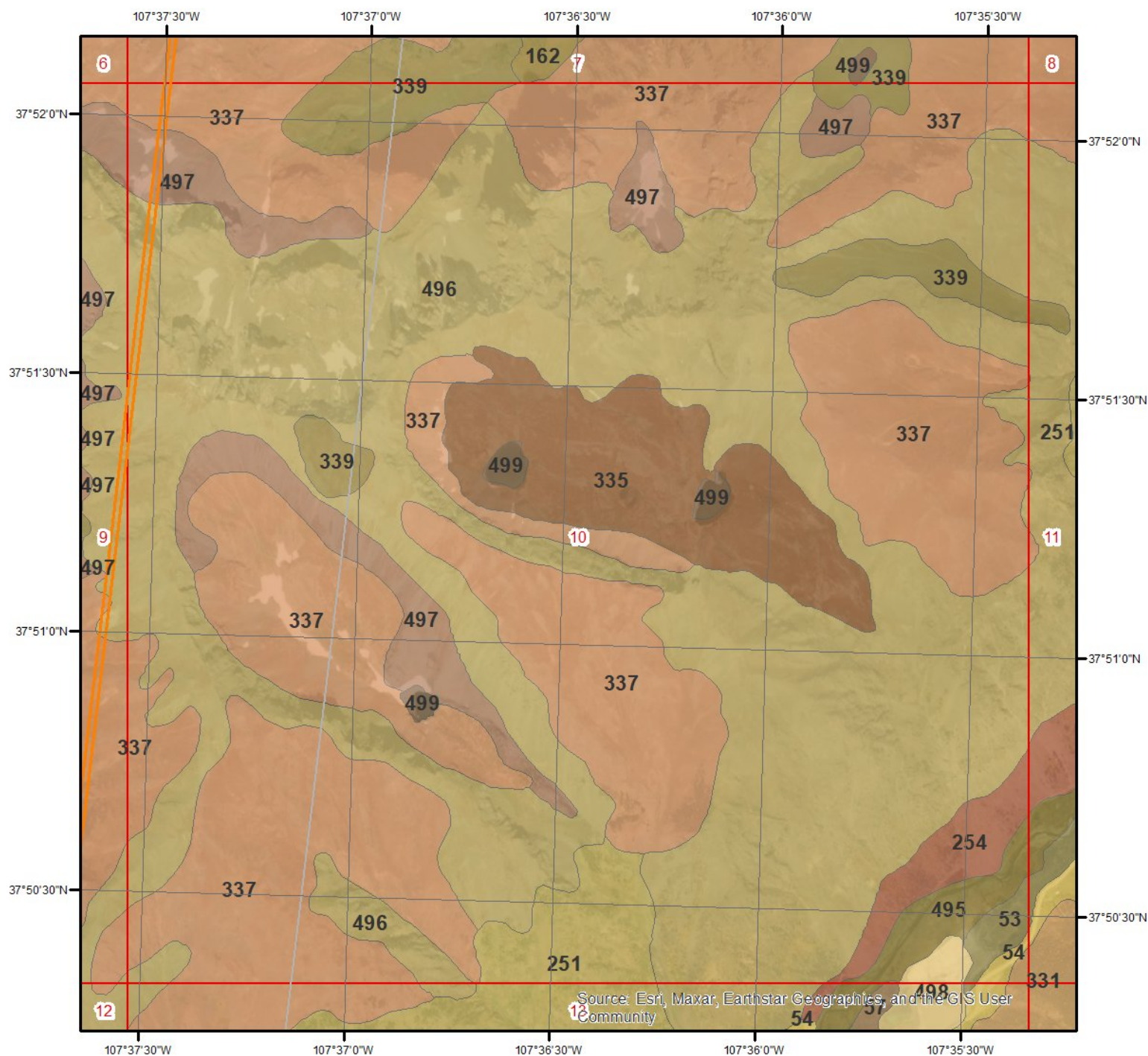
SSURGO Soils - Page 9



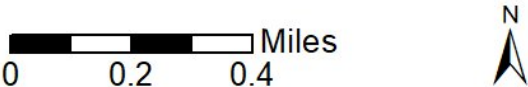
This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.



Soil Information



SSURGO Soils - Page 10

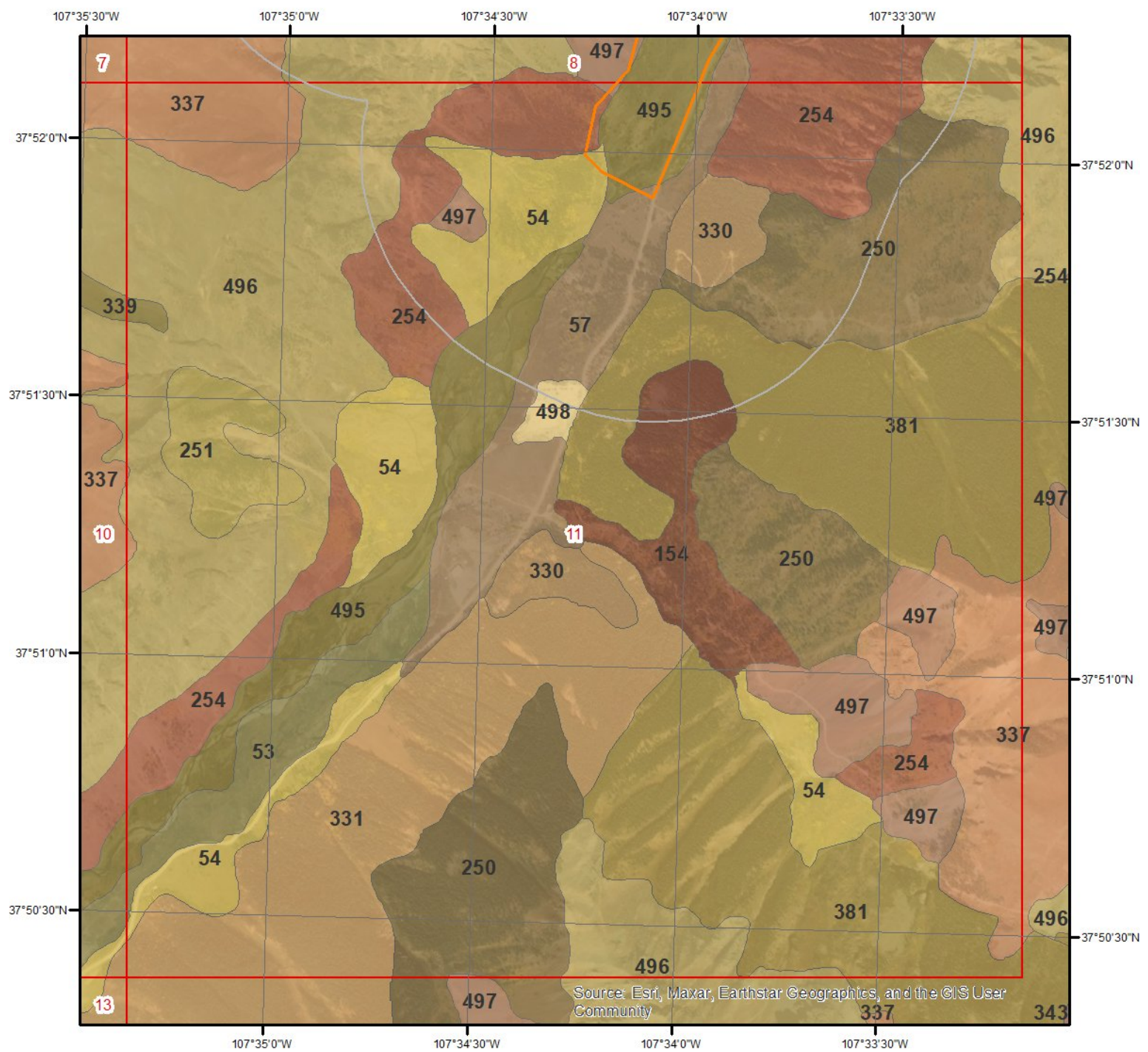


This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.

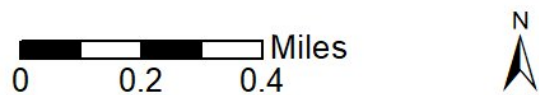




Soil Information



SSURGO Soils - Page 11

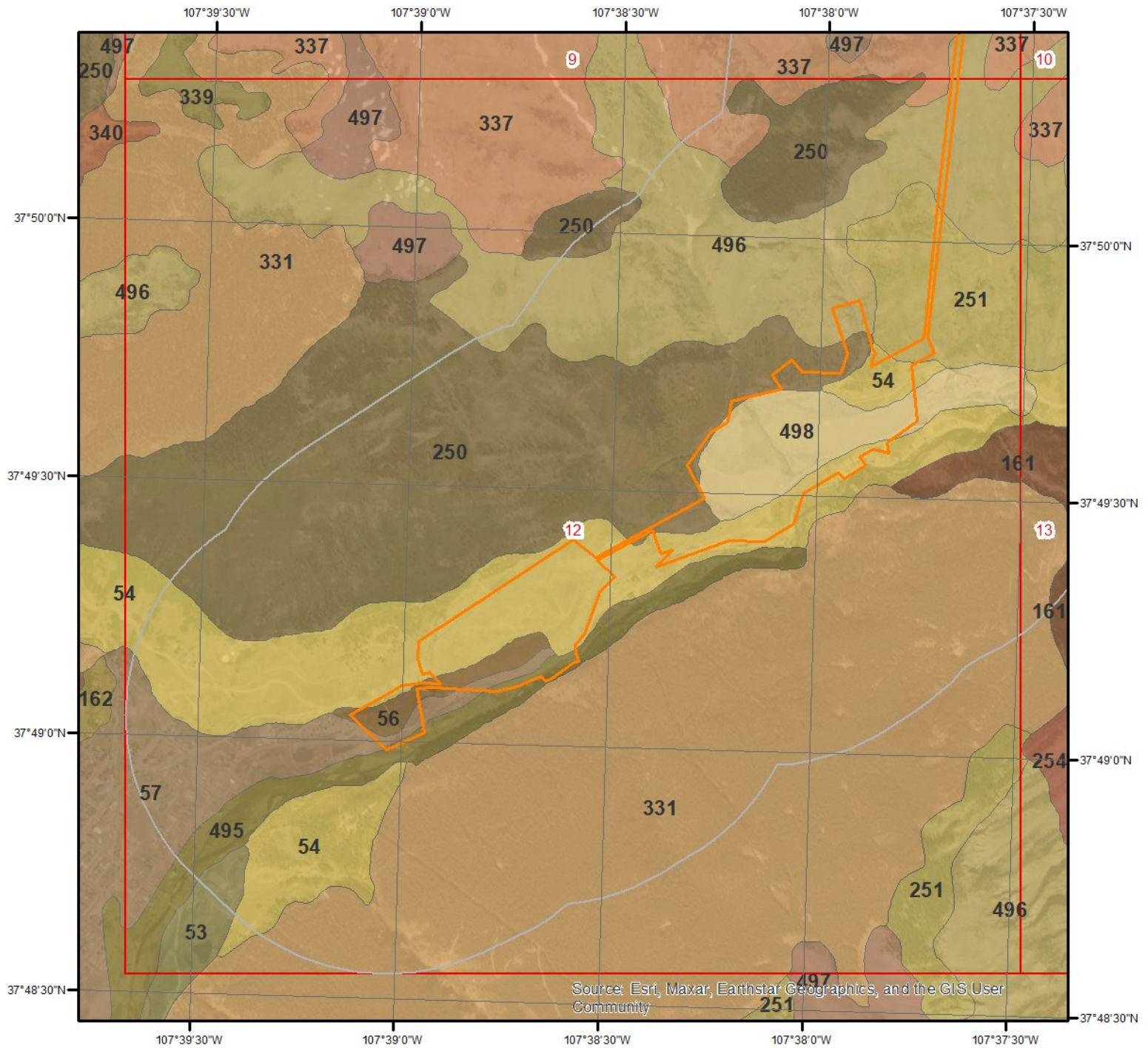


This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.





## Soil Information

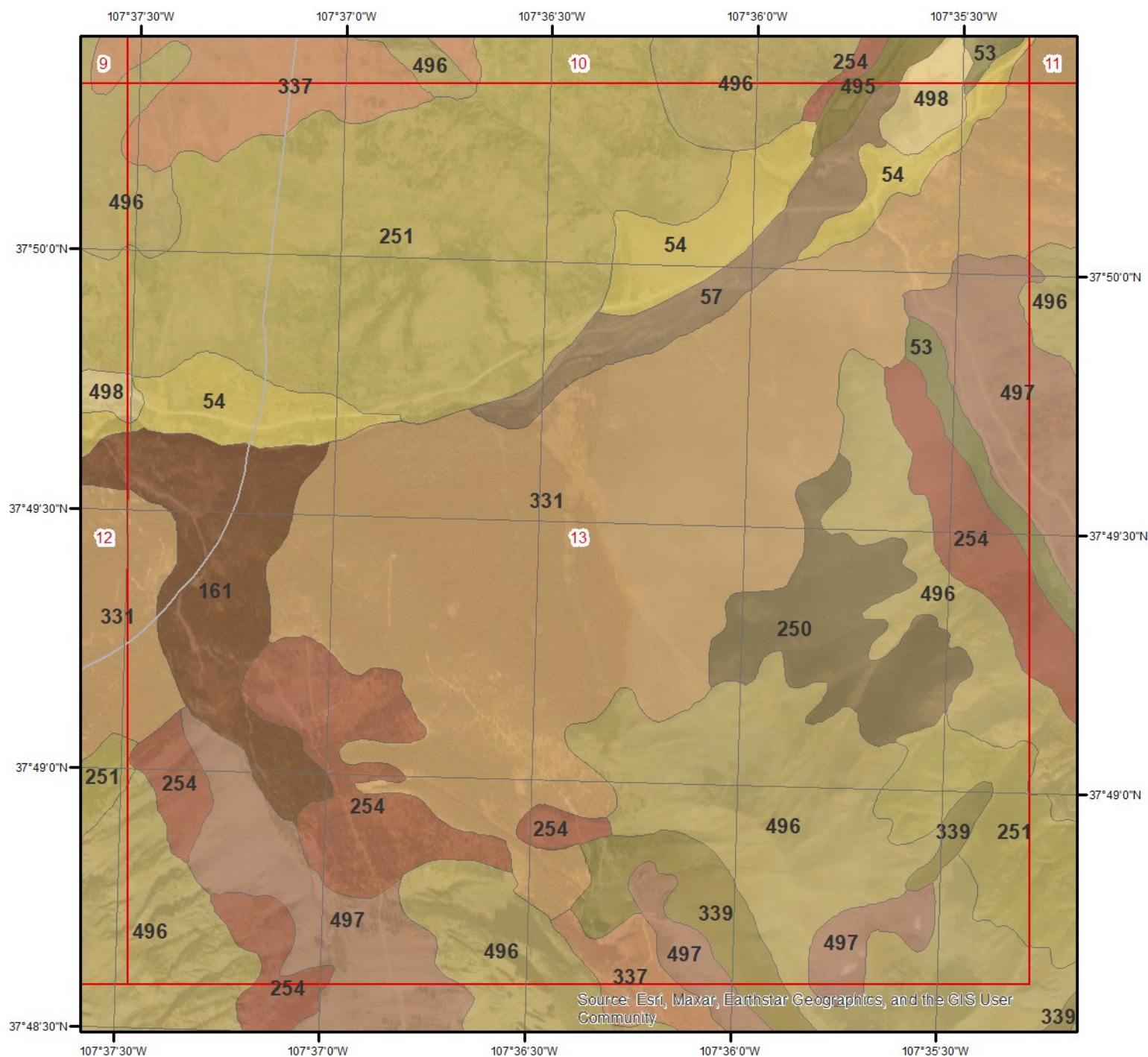


## SSURGO Soils - Page 12

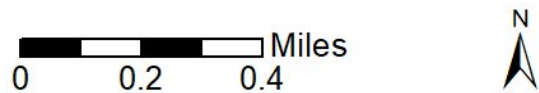
This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.



Soil Information



SSURGO Soils - Page 13



This maps shows SSURGO soil units around the target property. Please refer to the report for detailed soil descriptions.





## Soil Information

The previous page shows a soil map using SSURGO data from USDA Natural Resources Conservation Service. Detailed information about each unit is provided below.

### Map Unit 112 (0.79%)

Map Unit Name:	Cryorthents-Rock outcrop complex, 50 to 120 percent slopes, extremely stony
Bedrock Depth - Min:	0cm
Watertable Depth - Annual Min:	
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Cryorthents(50%)	
horizon A(0cm to 10cm)	Extremely stony silt loam
horizon C(10cm to 30cm)	Extremely cobbly loam
horizon R(30cm to 55cm)	Unweathered bedrock
Rock outcrop(40%)	
horizon R(0cm to 152cm)	Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 112 - Cryorthents-Rock outcrop complex, 50 to 120 percent slopes, extremely stony

Component: Cryorthents (50%)

The Cryorthents component makes up 50 percent of the map unit. Slopes are 50 to 120 percent. This component is on mountain slopes, ridges. The parent material consists of slope alluvium derived from tuff and/or colluvium derived from tuff. Depth to a root restrictive layer, bedrock, lithic, is 10 to 39 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 0 percent. Nonirrigated land capability classification is 8e. This soil does not meet hydric criteria.

Component: Rock outcrop (40%)

Generated brief soil descriptions are created for major soil components. The Rock outcrop is a miscellaneous area.

Component: Scout (5%)

Generated brief soil descriptions are created for major soil components. The Scout soil is a minor component.

Component: Rubble land (5%)

Generated brief soil descriptions are created for major soil components. The Rubble land soil is a minor component.

### Map Unit 120 (0.09%)

Map Unit Name:	Henson loam, 30 to 75 percent slopes, extremely stony
Bedrock Depth - Min:	
Watertable Depth - Annual Min:	
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	B - Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded.

Major components are printed below

Henson(85%)	
horizon A(0cm to 5cm)	Loam
horizon Bw1(5cm to 36cm)	Very cobbly sandy clay loam
horizon Bw2(36cm to 61cm)	Very gravelly sandy clay loam

## Soil Information

horizon C1(61cm to 84cm)  
horizon C2(84cm to 152cm)

Very cobbly sandy clay loam  
Extremely cobbly sandy clay loam

### Component Description:

Minor map unit components are excluded from this report.

Map Unit: 120 - Henson loam, 30 to 75 percent slopes, extremely stony

#### Component: Henson (85%)

The Henson component makes up 85 percent of the map unit. Slopes are 30 to 75 percent. This component is on mountain slopes, alluvial fans. The parent material consists of alluvium derived from rhyolite and/or slope alluvium derived from rhyolite and/or colluvium derived from rhyolite. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the R048AY309CO Unspecified ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

#### Component: Moran (5%)

Generated brief soil descriptions are created for major soil components. The Moran soil is a minor component.

#### Component: Telluride (5%)

Generated brief soil descriptions are created for major soil components. The Telluride soil is a minor component.

#### Component: Rock outcrop (3%)

Generated brief soil descriptions are created for major soil components. The Rock outcrop soil is a minor component.

#### Component: Rubble land (2%)

Generated brief soil descriptions are created for major soil components. The Rubble land soil is a minor component.

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### Map Unit 130 (0.04%)

Map Unit Name:	Moran, extremely stony-Telluride, extremely stony-Rock outcrop complex, 5 to 40 percent slopes
Bedrock Depth - Min:	46cm
Watertable Depth - Annual Min:	
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	B - Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded.

#### Major components are printed below

##### Moran(35%)

horizon A(0cm to 25cm)	Very stony loam
horizon Bw1(25cm to 64cm)	Very stony loam
horizon Bw2(64cm to 114cm)	Very stony loam
horizon C(114cm to 152cm)	Extremely cobbly loam

##### Telluride(25%)

horizon A(0cm to 25cm)	Very stony loam
horizon Bw1(25cm to 36cm)	Very stony loam
horizon Bw2(36cm to 46cm)	Extremely channery loam
horizon R(46cm to 150cm)	Bedrock

### Component Description:

Minor map unit components are excluded from this report.

Map Unit: 130 - Moran, extremely stony-Telluride, extremely stony-Rock outcrop complex, 5 to 40 percent slopes

#### Component: Moran (35%)

The Moran, extremely stony component makes up 35 percent of the map unit. Slopes are 5 to 40 percent. This component is on mountain slopes. The parent material consists of slope alluvium and/or colluvium derived from volcanic rock. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately



## Soil Information

high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. This component is in the R048AY304CO Alpine Slopes ecological site. Nonirrigated land capability classification is 7s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

### Component: Telluride (25%)

The Telluride, extremely stony component makes up 25 percent of the map unit. Slopes are 5 to 40 percent. This component is on mountain slopes. The parent material consists of slope alluvium and/or colluvium derived from volcanic rock over residuum weathered from andesite. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. This component is in the R048AY308CO Unspecified ecological site. Nonirrigated land capability classification is 7s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

### Component: Rock outcrop (20%)

Generated brief soil descriptions are created for major soil components. The Rock outcrop is a miscellaneous area.

### Component: Sawpit (5%)

Generated brief soil descriptions are created for major soil components. The Sawpit soil is a minor component.

### Component: Henson (5%)

Generated brief soil descriptions are created for major soil components. The Henson soil is a minor component.

### Component: Rubble land (5%)

Generated brief soil descriptions are created for major soil components. The Rubble land soil is a minor component.

### Component: Whitecross (5%)

Generated brief soil descriptions are created for major soil components. The Whitecross soil is a minor component.

---

### Map Unit 145 (0.2%)

Map Unit Name:	Rock outcrop
Bedrock Depth - Min:	0cm
Watertable Depth - Annual Min:	
Drainage Class - Dominant:	
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.
Major components are printed below	
Rock outcrop(90%)	
horizon R(0cm to 152cm)	Unweathered bedrock

### Component Description:

Minor map unit components are excluded from this report.

Map Unit: 145 - Rock outcrop

### Component: Rock outcrop (90%)

Generated brief soil descriptions are created for major soil components. The Rock outcrop is a miscellaneous area.

### Component: Rubble land (5%)

Generated brief soil descriptions are created for major soil components. The Rubble land soil is a minor component.

### Component: Cryorthents (5%)

Generated brief soil descriptions are created for major soil components. The Cryorthents soil is a minor component.

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### Map Unit 150 (0.39%)

Map Unit Name:	Rubble land
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## Soil Information

Bedrock Depth - Min:

Watertable Depth - Annual Min:

Drainage Class - Dominant:

Excessively drained

Hydrologic Group - Dominant:

A - Soils in this group have low runoff potential when thoroughly wet. Water is transmitted freely through the soil.

Major components are printed below

Rubble land(90%)

horizon H1(0cm to 152cm)

Fragmental material

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 150 - Rubble land

Component: Rubble land (90%)

Generated brief soil descriptions are created for major soil components. The Rubble land is a miscellaneous area.

Component: Cryorthents (5%)

Generated brief soil descriptions are created for major soil components. The Cryorthents soil is a minor component.

Component: Rock outcrop (5%)

Generated brief soil descriptions are created for major soil components. The Rock outcrop soil is a minor component.

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### Map Unit 154 (0.27%)

Map Unit Name:

Frisco-Horsethief complex, 30 to 75 percent slopes

Bedrock Depth - Min:

Watertable Depth - Annual Min:

Drainage Class - Dominant:

Well drained

Hydrologic Group - Dominant:

B - Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded.

Major components are printed below

Frisco(60%)

horizon Oi(0cm to 5cm)

Slightly decomposed plant material

horizon A(5cm to 13cm)

Loam

horizon E1(13cm to 28cm)

Loam

horizon E2(28cm to 48cm)

Cobbly loam

horizon Bt1(48cm to 122cm)

Extremely stony sandy clay loam

horizon Bt2(122cm to 157cm)

Extremely stony loam

Horsethief(25%)

horizon Oi(0cm to 5cm)

Slightly decomposed plant material

horizon A(5cm to 13cm)

Loam

horizon E1(13cm to 41cm)

Fine sandy loam

horizon E2(41cm to 61cm)

Fine sandy loam

horizon E/B(61cm to 81cm)

Fine sandy loam

horizon E/B(61cm to 81cm)

Sandy clay loam

horizon Bt(81cm to 124cm)

Very stony clay loam

horizon BC(124cm to 157cm)

Very stony clay loam

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 154 - Frisco-Horsethief complex, 30 to 75 percent slopes

Component: Frisco (60%)

The Frisco component makes up 60 percent of the map unit. Slopes are 30 to 70 percent. This component is on mountain slopes. The

## Soil Information

parent material consists of outwash, colluvium, and slope alluvium derived from granitic, volcanic, and sedimentary rocks. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 85 percent. Below this thin organic horizon the organic matter content is about 2 percent. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

### Component: Horsethief (25%)

The Horsethief component makes up 25 percent of the map unit. Slopes are 30 to 75 percent. This component is on mountain slopes. The parent material consists of colluvium and slope alluvium derived from sandstone, volcanic and igneous rocks. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 85 percent. Below this thin organic horizon the organic matter content is about 2 percent. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

### Component: Snowdon (10%)

Generated brief soil descriptions are created for major soil components. The Snowdon soil is a minor component.

### Component: Quazar (5%)

Generated brief soil descriptions are created for major soil components. The Quazar soil is a minor component.

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### Map Unit 161 (0.45%)

Map Unit Name:	Needleton stony loam, 5 to 15 percent slopes
Bedrock Depth - Min:	
Watertable Depth - Annual Min:	
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.

Major components are printed below

#### Needleton(85%)

horizon Oi(0cm to 5cm)	Slightly decomposed plant material
horizon E(5cm to 41cm)	Stony loam
horizon B/E(41cm to 66cm)	Very cobbly loam
horizon B/E(41cm to 66cm)	Very cobbly sandy clay loam
horizon Bt1(66cm to 122cm)	Very stony sandy clay loam
horizon Bt2(122cm to 157cm)	Very cobbly clay loam

### Component Description:

Minor map unit components are excluded from this report.

Map Unit: 161 - Needleton stony loam, 5 to 15 percent slopes

### Component: Needleton (85%)

The Needleton component makes up 85 percent of the map unit. Slopes are 5 to 15 percent. This component is on toeslopes mountain slopes. The parent material consists of alluvium and slope alluvium derived from rhyolite and sandstone. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 85 percent. Below this thin organic horizon the organic matter content is about 1 percent. Nonirrigated land capability classification is 7s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

### Component: Haviland (10%)

Generated brief soil descriptions are created for major soil components. The Haviland soil is a minor component.

### Component: Wander (5%)

Generated brief soil descriptions are created for major soil components. The Wander soil is a minor component.

## Soil Information

### Map Unit 162 (0.34%)

Map Unit Name:	Quazar-Varden complex, 15 to 65 percent slopes
Bedrock Depth - Min:	
Watertable Depth - Annual Min:	
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	B - Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded.
Major components are printed below	
Quazar(45%)	
horizon A(0cm to 30cm)	Very cobbly loam
horizon Bt(30cm to 66cm)	Extremely gravelly clay loam
horizon C(66cm to 152cm)	Extremely gravelly clay loam
Varden(40%)	
horizon A(0cm to 38cm)	Very cobbly loam
horizon 2C1(38cm to 76cm)	Extremely cobbly loam
horizon 2C2(76cm to 152cm)	Extremely cobbly loam

#### Component Description:

Minor map unit components are excluded from this report.

Map Unit: 162 - Quazar-Varden complex, 15 to 65 percent slopes

#### Component: Quazar (45%)

The Quazar component makes up 45 percent of the map unit. Slopes are 15 to 65 percent. This component is on alluvial fans, mountain slopes. The parent material consists of alluvium and slope alluvium derived from volcanic and sandstone rocks. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. This component is in the R048AY250CO Subalpine Loam ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

#### Component: Varden (40%)

The Varden component makes up 40 percent of the map unit. Slopes are 15 to 65 percent. This component is on alluvial fans, mountain slopes. The parent material consists of colluvium, alluvium, and slope alluvium derived from rhyolite, tuff and sandstone. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 4 percent. This component is in the R048AY250CO Subalpine Loam ecological site. Nonirrigated land capability classification is 7s. This soil does not meet hydric criteria.

#### Component: Needleton (10%)

Generated brief soil descriptions are created for major soil components. The Needleton soil is a minor component.

#### Component: Snowdon (5%)

Generated brief soil descriptions are created for major soil components. The Snowdon soil is a minor component.

### Map Unit 170 (0.25%)

Map Unit Name:	Whitecross, very stony-Rock outcrop complex, 15 to 45 percent slopes
Bedrock Depth - Min:	48cm
Watertable Depth - Annual Min:	
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.
Major components are printed below	
Whitecross(55%)	

## Soil Information

horizon Oi(0cm to 3cm)	Slightly decomposed plant material
horizon A(3cm to 10cm)	Very stony sandy loam
horizon Bw1(10cm to 25cm)	Very stony loam
horizon Bw2(25cm to 48cm)	Extremely stony sandy loam
horizon R(48cm to 150cm)	Bedrock

### Component Description:

Minor map unit components are excluded from this report.

Map Unit: 170 - Whitecross, very stony-Rock outcrop complex, 15 to 45 percent slopes

### Component: Whitecross (55%)

The Whitecross, very stony component makes up 55 percent of the map unit. Slopes are 15 to 45 percent. This component is on mountain slopes. The parent material consists of colluvium derived from volcanic rock. Depth to a root restrictive layer, bedrock, lithic, is 7 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 75 percent. Below this thin organic horizon the organic matter content is about 3 percent. This component is in the R048AY308CO Unspecified ecological site. Nonirrigated land capability classification is 7s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

### Component: Rock outcrop (30%)

Generated brief soil descriptions are created for major soil components. The Rock outcrop is a miscellaneous area.

### Component: Henson (10%)

Generated brief soil descriptions are created for major soil components. The Henson soil is a minor component.

### Component: Telluride (5%)

Generated brief soil descriptions are created for major soil components. The Telluride soil is a minor component.

## Map Unit 171 (1.29%)

Map Unit Name:	Whitecross-Rock outcrop complex, 45 to 75 percent slopes, extremely stony
Bedrock Depth - Min:	0cm
Watertable Depth - Annual Min:	
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

### Whitecross(50%)

horizon A(0cm to 10cm)	Very cobbly loam
horizon Bw(10cm to 36cm)	Very cobbly loam
horizon Bw(10cm to 36cm)	Very cobbly sandy loam
horizon R(36cm to 46cm)	Unweathered bedrock

### Rock outcrop(35%)

horizon R(0cm to 152cm)	Unweathered bedrock
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### Component Description:

Minor map unit components are excluded from this report.

Map Unit: 171 - Whitecross-Rock outcrop complex, 45 to 75 percent slopes, extremely stony

### Component: Whitecross (50%)

The Whitecross component makes up 50 percent of the map unit. Slopes are 45 to 75 percent. This component is on mountain slopes, ridges. The parent material consists of slope alluvium derived from rhyolite and/or colluvium derived from rhyolite. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the



## Soil Information

surface horizon is about 1 percent. This component is in the R048AY308CO Unspecified ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria.

Component: Rock outcrop (35%)

Generated brief soil descriptions are created for major soil components. The Rock outcrop is a miscellaneous area.

Component: Rubble land (10%)

Generated brief soil descriptions are created for major soil components. The Rubble land soil is a minor component.

Component: Moran (5%)

Generated brief soil descriptions are created for major soil components. The Moran soil is a minor component.

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### Map Unit 172 (0.01%)

Map Unit Name: Water

No more attributes available for this map unit

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 172 - Water

Component: Water (100%)

Generated brief soil descriptions are created for major soil components. The Water is a miscellaneous area.

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### Map Unit 250 (4.05%)

Map Unit Name: Snowdon-Rock outcrop complex, 30 to 65 percent slopes

Bedrock Depth - Min: 0cm

Watertable Depth - Annual Min:

Drainage Class - Dominant: Well drained

Hydrologic Group - Dominant: C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.

Major components are printed below

Snowdon(55%)

horizon Oi(0cm to 5cm)

Slightly decomposed plant material

horizon A(5cm to 15cm)

Very stony loam

horizon E(15cm to 33cm)

Very stony sandy loam

horizon Bt(33cm to 51cm)

Extremely stony sandy clay loam

horizon R(51cm to 61cm)

Unweathered bedrock

Rock outcrop(25%)

horizon R(0cm to 152cm)

Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 250 - Snowdon-Rock outcrop complex, 30 to 65 percent slopes

Component: Snowdon (55%)

The Snowdon component makes up 55 percent of the map unit. Slopes are 30 to 65 percent. This component is on mountain slopes. The parent material consists of residuum and slope alluvium derived from rhyolite, sandstone, and limestone. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 85 percent. Below this thin organic horizon the organic matter content is about 2 percent. Nonirrigated land capability classification is 7s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

## Soil Information

### Component: Rock outcrop (25%)

Generated brief soil descriptions are created for major soil components. The Rock outcrop is a miscellaneous area.

### Component: Needleton (10%)

Generated brief soil descriptions are created for major soil components. The Needleton soil is a minor component.

### Component: Quazar (5%)

Generated brief soil descriptions are created for major soil components. The Quazar soil is a minor component.

### Component: Henson (3%)

Generated brief soil descriptions are created for major soil components. The Henson soil is a minor component.

### Component: Rubble land (2%)

Generated brief soil descriptions are created for major soil components. The Rubble land soil is a minor component.

## Map Unit 251 (2.39%)

Map Unit Name: Rock outcrop-Snowdon complex, 45 to 75 percent slopes

Bedrock Depth - Min: 0cm

Watertable Depth - Annual Min:

Drainage Class - Dominant:

Hydrologic Group - Dominant:

Major components are printed below

### Rock outcrop(60%)

horizon R(0cm to 152cm) Unweathered bedrock

### Snowdon(25%)

horizon Oi(0cm to 5cm) Slightly decomposed plant material

horizon A(5cm to 15cm) Very stony loam

horizon E(15cm to 33cm) Very stony sandy loam

horizon Bt(33cm to 51cm) Extremely stony sandy clay loam

horizon R(51cm to 61cm) Unweathered bedrock

### Component Description:

Minor map unit components are excluded from this report.

Map Unit: 251 - Rock outcrop-Snowdon complex, 45 to 75 percent slopes

### Component: Rock outcrop (60%)

Generated brief soil descriptions are created for major soil components. The Rock outcrop is a miscellaneous area.

### Component: Snowdon (25%)

The Snowdon component makes up 25 percent of the map unit. Slopes are 45 to 75 percent. This component is on mountain slopes. The parent material consists of colluvium and residuum derived from rhyolite, sandstone and limestone. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 85 percent. Below this thin organic horizon the organic matter content is about 2 percent. Nonirrigated land capability classification is 7s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

### Component: Needleton (5%)

Generated brief soil descriptions are created for major soil components. The Needleton soil is a minor component.

### Component: Quazar (5%)

Generated brief soil descriptions are created for major soil components. The Quazar soil is a minor component.

### Component: Whitecross (3%)

Generated brief soil descriptions are created for major soil components. The Whitecross soil is a minor component.

### Component: Rubble land (2%)

## Soil Information

Generated brief soil descriptions are created for major soil components. The Rubble land soil is a minor component.

### Map Unit 254 (2.05%)

Map Unit Name:	Cryorthents-Rubble land complex, 30 to 75 percent slopes
Bedrock Depth - Min:	203cm
Watertable Depth - Annual Min:	
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	A - Soils in this group have low runoff potential when thoroughly wet. Water is transmitted freely through the soil.

Major components are printed below

Typic Cryorthents(50%)	
horizon A(0cm to 13cm)	Extremely stony loam
horizon C(13cm to 152cm)	Extremely stony loam
Rubble land(30%)	
horizon C(0cm to 152cm)	Fragmental material

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 254 - Cryorthents-Rubble land complex, 30 to 75 percent slopes

Component: Typic Cryorthents (50%)

The Typic Cryorthents component makes up 50 percent of the map unit. Slopes are 30 to 75 percent. This component is on mountain slopes, alluvial fans. The parent material consists of colluvium and slope alluvium derived from rhyolite. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 7s. This soil does not meet hydric criteria.

Component: Rubble land (30%)

Generated brief soil descriptions are created for major soil components. The Rubble land is a miscellaneous area.

Component: Quazar (10%)

Generated brief soil descriptions are created for major soil components. The Quazar soil is a minor component.

Component: Needleton (5%)

Generated brief soil descriptions are created for major soil components. The Needleton soil is a minor component.

Component: Henson (3%)

Generated brief soil descriptions are created for major soil components. The Henson soil is a minor component.

Component: Rock outcrop (2%)

Generated brief soil descriptions are created for major soil components. The Rock outcrop soil is a minor component.

### Map Unit 330 (0.09%)

Map Unit Name:	Needleton stony loam, 15 to 30 percent slopes
Bedrock Depth - Min:	
Watertable Depth - Annual Min:	
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.

Major components are printed below

Needleton(85%)	
horizon Oi(0cm to 5cm)	Slightly decomposed plant material

## Soil Information

horizon E(5cm to 41cm)	Stony loam
horizon B/E(41cm to 66cm)	Very cobbly loam
horizon B/E(41cm to 66cm)	Very cobbly sandy clay loam
horizon Bt1(66cm to 122cm)	Very stony sandy clay loam
horizon Bt2(122cm to 157cm)	Very cobbly clay loam

### Component Description:

Minor map unit components are excluded from this report.

Map Unit: 330 - Needleton stony loam, 15 to 30 percent slopes

### Component: Needleton (85%)

The Needleton component makes up 85 percent of the map unit. Slopes are 15 to 30 percent. This component is on mountain slopes. The parent material consists of slope alluvium derived from rhyolite and sandstone. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 85 percent. Below this thin organic horizon the organic matter content is about 1 percent. Nonirrigated land capability classification is 7s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

### Component: Snowdon (8%)

Generated brief soil descriptions are created for major soil components. The Snowdon soil is a minor component.

### Component: Haviland (5%)

Generated brief soil descriptions are created for major soil components. The Haviland soil is a minor component.

### Component: Quazar (2%)

Generated brief soil descriptions are created for major soil components. The Quazar soil is a minor component.

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## Map Unit 331 (19.78%)

Map Unit Name:	Needleton stony loam, 30 to 65 percent slopes
Bedrock Depth - Min:	
Watertable Depth - Annual Min:	
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	B - Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded.

Major components are printed below

### Needleton(80%)

horizon Oi(0cm to 5cm)	Slightly decomposed plant material
horizon E(5cm to 41cm)	Stony loam
horizon B/E(41cm to 66cm)	Very cobbly sandy clay loam
horizon Bt1(66cm to 122cm)	Very stony sandy clay loam
horizon Bt2(122cm to 157cm)	Very cobbly clay loam

### Component Description:

Minor map unit components are excluded from this report.

Map Unit: 331 - Needleton stony loam, 30 to 65 percent slopes

### Component: Needleton (80%)

The Needleton, stony component makes up 80 percent of the map unit. Slopes are 30 to 65 percent. This component is on mountain slopes. The parent material consists of colluvium derived from rhyolite and/or colluvium derived from sandstone. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 75 percent. Below this thin organic horizon the organic matter content is about 1 percent. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

## Soil Information

### Component: Snowdon (10%)

Generated brief soil descriptions are created for major soil components. The Snowdon soil is a minor component.

### Component: Rock outcrop (5%)

Generated brief soil descriptions are created for major soil components. The Rock outcrop soil is a minor component.

### Component: Quazar (5%)

Generated brief soil descriptions are created for major soil components. The Quazar soil is a minor component.

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### Map Unit 334 (0.04%)

Map Unit Name:	Henson very gravelly loam, south aspect, 30 to 60 percent slopes
Bedrock Depth - Min:	
Watertable Depth - Annual Min:	
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	B - Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded.
Major components are printed below	
Henson(80%)	
horizon Oi(0cm to 3cm)	Slightly decomposed plant material
horizon A(3cm to 13cm)	Very gravelly loam
horizon Bw1(13cm to 33cm)	Very cobbly loam
horizon Bw2(33cm to 64cm)	Very stony sandy clay loam
horizon C(64cm to 155cm)	Extremely stony sandy loam

### Component Description:

Minor map unit components are excluded from this report.

Map Unit: 334 - Henson very gravelly loam, south aspect, 30 to 60 percent slopes

### Component: Henson (80%)

The Henson, south aspect component makes up 80 percent of the map unit. Slopes are 30 to 60 percent. This component is on alpine mountain slopes. The parent material consists of colluvium and slope alluvium derived from rhyolite. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 85 percent. Below this thin organic horizon the organic matter content is about 2 percent. This component is in the R048AY309CO Warm Alpine ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

### Component: Whitecross (10%)

Generated brief soil descriptions are created for major soil components. The Whitecross soil is a minor component.

### Component: Moran (5%)

Generated brief soil descriptions are created for major soil components. The Moran soil is a minor component.

### Component: Telluride (4%)

Generated brief soil descriptions are created for major soil components. The Telluride soil is a minor component.

### Component: Rock outcrop (1%)

Generated brief soil descriptions are created for major soil components. The Rock outcrop soil is a minor component.

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### Map Unit 335 (2.89%)

Map Unit Name:	Whitecross, very stony-Rock outcrop complex, 15 to 45 percent slopes
Bedrock Depth - Min:	48cm
Watertable Depth - Annual Min:	
Drainage Class - Dominant:	Well drained



## Soil Information

Hydrologic Group - Dominant:

D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Whitecross(55%)

horizon Oi(0cm to 3cm)

Slightly decomposed plant material

horizon A(3cm to 10cm)

Very stony sandy loam

horizon Bw1(10cm to 25cm)

Very stony loam

horizon Bw2(25cm to 48cm)

Extremely stony sandy loam

horizon R(48cm to 150cm)

Bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 335 - Whitecross, very stony-Rock outcrop complex, 15 to 45 percent slopes

Component: Whitecross (55%)

The Whitecross, very stony component makes up 55 percent of the map unit. Slopes are 15 to 45 percent. This component is on mountain slopes. The parent material consists of colluvium derived from volcanic rock. Depth to a root restrictive layer, bedrock, lithic, is 7 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 75 percent. Below this thin organic horizon the organic matter content is about 3 percent. This component is in the R048AY308CO Shallow Alpine ecological site. Nonirrigated land capability classification is 7s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Rock outcrop (30%)

Generated brief soil descriptions are created for major soil components. The Rock outcrop is a miscellaneous area.

Component: Henson (10%)

Generated brief soil descriptions are created for major soil components. The Henson soil is a minor component.

Component: Telluride (5%)

Generated brief soil descriptions are created for major soil components. The Telluride soil is a minor component.

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### Map Unit 337 (25.74%)

Map Unit Name:

Whitecross-Rock outcrop complex, 45 to 75 percent slopes

Bedrock Depth - Min:

0cm

Watertable Depth - Annual Min:

Drainage Class - Dominant:

Well drained

Hydrologic Group - Dominant:

D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Whitecross(60%)

horizon Oi(0cm to 3cm)

Slightly decomposed plant material

horizon A(3cm to 10cm)

Very stony sandy loam

horizon Bw1(10cm to 25cm)

Very gravelly loam

horizon Bw2(25cm to 48cm)

Extremely gravelly sandy loam

horizon R(48cm to 58cm)

Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 337 - Whitecross-Rock outcrop complex, 45 to 75 percent slopes

Component: Whitecross (60%)

The Whitecross component makes up 60 percent of the map unit. Slopes are 45 to 75 percent. This component is on alpine mountain slopes, ridges. The parent material consists of slope alluvium and colluvium derived from rhyolite and similar volcanic rocks and in

## Soil Information

some places from granitic rocks. Depth to a root restrictive layer, bedrock, lithic, is 7 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 85 percent. Below this thin organic horizon the organic matter content is about 3 percent. This component is in the R048AY308CO Shallow Alpine ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Rock outcrop (25%)

Generated brief soil descriptions are created for major soil components. The Rock outcrop is a miscellaneous area.

Component: Henson (10%)

Generated brief soil descriptions are created for major soil components. The Henson soil is a minor component.

Component: Needleton (2%)

Generated brief soil descriptions are created for major soil components. The Needleton soil is a minor component.

Component: Rubble land (1%)

Generated brief soil descriptions are created for major soil components. The Rubble land soil is a minor component.

Component: Cryaquents (1%)

Generated brief soil descriptions are created for major soil components. The Cryaquents soil is a minor component.

Component: Cryofibrists (1%)

Generated brief soil descriptions are created for major soil components. The Cryofibrists soil is a minor component.

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### Map Unit 339 (5.25%)

Map Unit Name: Henson very gravelly loam, 30 to 60 percent slopes

Bedrock Depth - Min:

Watertable Depth - Annual Min:

Drainage Class - Dominant: Well drained

Hydrologic Group - Dominant: B - Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded.

Major components are printed below

Henson(80%)

horizon Oi(0cm to 3cm)	Slightly decomposed plant material
horizon A(3cm to 13cm)	Very gravelly loam
horizon Bw1(13cm to 33cm)	Very cobbly loam
horizon Bw2(33cm to 64cm)	Very stony sandy clay loam
horizon C(64cm to 155cm)	Extremely stony sandy loam

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 339 - Henson very gravelly loam, 30 to 60 percent slopes

Component: Henson (80%)

The Henson component makes up 80 percent of the map unit. Slopes are 30 to 60 percent. This component is on mountain slopes, alpine valleys. The parent material consists of colluvium and/or slope alluvium derived from rhyolite. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 85 percent. Below this thin organic horizon the organic matter content is about 2 percent. This component is in the R048AY304CO Alpine Slopes ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Whitecross (5%)

Generated brief soil descriptions are created for major soil components. The Whitecross soil is a minor component.

Component: Telluride (5%)

## Soil Information

Generated brief soil descriptions are created for major soil components. The Telluride soil is a minor component.

Component: Moran (5%)

Generated brief soil descriptions are created for major soil components. The Moran soil is a minor component.

Component: Rock outcrop (2%)

Generated brief soil descriptions are created for major soil components. The Rock outcrop soil is a minor component.

Component: Cryaquents (2%)

Generated brief soil descriptions are created for major soil components. The Cryaquents soil is a minor component.

Component: Cryofibrists (1%)

Generated brief soil descriptions are created for major soil components. The Cryofibrists soil is a minor component.

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### Map Unit 340 (0.45%)

Map Unit Name:

Moran very gravelly loam, 10 to 30 percent slopes

Bedrock Depth - Min:

Watertable Depth - Annual Min:

Drainage Class - Dominant:

Well drained

Hydrologic Group - Dominant:

B - Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded.

Major components are printed below

Moran(80%)

horizon Oi(0cm to 3cm)

Slightly decomposed plant material

horizon A(3cm to 25cm)

Very gravelly loam

horizon Bw(25cm to 69cm)

Extremely gravelly loam

horizon C(69cm to 155cm)

Extremely gravelly loam

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 340 - Moran very gravelly loam, 10 to 30 percent slopes

Component: Moran (80%)

The Moran component makes up 80 percent of the map unit. Slopes are 10 to 30 percent. This component is on alpine valleys, mountain slopes. The parent material consists of colluvium and slope alluvium derived from rhyolite, tuff, and similar volcanic rocks. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 85 percent. Below this thin organic horizon the organic matter content is about 3 percent. This component is in the R048AY304CO Alpine Slopes ecological site. Nonirrigated land capability classification is 6e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Telluride (5%)

Generated brief soil descriptions are created for major soil components. The Telluride soil is a minor component.

Component: Henson (5%)

Generated brief soil descriptions are created for major soil components. The Henson soil is a minor component.

Component: Whitecross (5%)

Generated brief soil descriptions are created for major soil components. The Whitecross soil is a minor component.

Component: Rock outcrop (2%)

Generated brief soil descriptions are created for major soil components. The Rock outcrop soil is a minor component.

Component: Cryaquents (2%)

Generated brief soil descriptions are created for major soil components. The Cryaquents soil is a minor component.

Component: Cryofibrists (1%)

## Soil Information

Generated brief soil descriptions are created for major soil components. The Cryofibrists soil is a minor component.

### Map Unit 341 (0.18%)

Map Unit Name: Moran very gravelly loam, 30 to 65 percent slopes  
Bedrock Depth - Min:  
Watertable Depth - Annual Min:  
Drainage Class - Dominant: Well drained  
Hydrologic Group - Dominant: B - Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded.

Major components are printed below

Moran(80%)

horizon Oi(0cm to 3cm)	Slightly decomposed plant material
horizon A(3cm to 25cm)	Very gravelly loam
horizon Bw(25cm to 69cm)	Extremely gravelly loam
horizon C(69cm to 155cm)	Extremely gravelly loam

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 341 - Moran very gravelly loam, 30 to 65 percent slopes

Component: Moran (80%)

The Moran component makes up 80 percent of the map unit. Slopes are 30 to 65 percent. This component is on mountain slopes, alpine valleys. The parent material consists of colluvium and slope alluvium derived from rhyolite, tuff, and similar volcanic rocks. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 85 percent. Below this thin organic horizon the organic matter content is about 3 percent. This component is in the R048AY304CO Alpine Slopes ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Whitecross (5%)

Generated brief soil descriptions are created for major soil components. The Whitecross soil is a minor component.

Component: Henson (5%)

Generated brief soil descriptions are created for major soil components. The Henson soil is a minor component.

Component: Telluride (5%)

Generated brief soil descriptions are created for major soil components. The Telluride soil is a minor component.

Component: Cryaquents (2%)

Generated brief soil descriptions are created for major soil components. The Cryaquents soil is a minor component.

Component: Rock outcrop (2%)

Generated brief soil descriptions are created for major soil components. The Rock outcrop soil is a minor component.

Component: Cryofibrists (1%)

Generated brief soil descriptions are created for major soil components. The Cryofibrists soil is a minor component.

### Map Unit 343 (1.94%)

Map Unit Name: Telluride-Rock outcrop complex, 45 to 75 percent slopes  
Bedrock Depth - Min: 0cm  
Watertable Depth - Annual Min:  
Drainage Class - Dominant: Well drained  
Hydrologic Group - Dominant: D - Soils in this group have high runoff potential when thoroughly wet. Water

## Soil Information

movement through the soil is restricted or very restricted.

Major components are printed below

### Telluride(60%)

horizon Oi(0cm to 3cm)	Slightly decomposed plant material
horizon A1(3cm to 18cm)	Very cobbly loam
horizon A2(18cm to 30cm)	Stony loam
horizon Bw(30cm to 48cm)	Very stony loam
horizon R(48cm to 56cm)	Bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 343 - Telluride-Rock outcrop complex, 45 to 75 percent slopes

### Component: Telluride (60%)

The Telluride component makes up 60 percent of the map unit. Slopes are 45 to 75 percent. This component is on ridges, alpine mountain slopes. The parent material consists of slope alluvium and colluvium derived from rhyolite, tuff, and similar volcanic rocks. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 85 percent. Below this thin organic horizon the organic matter content is about 4 percent. This component is in the R048AY308CO Shallow Alpine ecological site. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

### Component: Rock outcrop (25%)

Generated brief soil descriptions are created for major soil components. The Rock outcrop is a miscellaneous area.

### Component: Moran (10%)

Generated brief soil descriptions are created for major soil components. The Moran soil is a minor component.

### Component: Whitecross (4%)

Generated brief soil descriptions are created for major soil components. The Whitecross soil is a minor component.

### Component: Rubble land (1%)

Generated brief soil descriptions are created for major soil components. The Rubble land soil is a minor component.

## Map Unit 381 (1.59%)

Map Unit Name:	Needleton-Snowdon-Rock outcrop complex, 30 to 80 percent slopes
Bedrock Depth - Min:	0cm
Watertable Depth - Annual Min:	
Drainage Class - Dominant:	Well drained
Hydrologic Group - Dominant:	C - Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.

Major components are printed below

### Needleton(45%)

horizon Oi(0cm to 5cm)	Slightly decomposed plant material
horizon E(5cm to 41cm)	Stony loam
horizon B/E(41cm to 66cm)	Very cobbly loam
horizon B/E(41cm to 66cm)	Very cobbly sandy clay loam
horizon Bt1(66cm to 122cm)	Very stony sandy clay loam
horizon Bt2(122cm to 157cm)	Very cobbly clay loam

### Snowdon(30%)

horizon Oi(0cm to 5cm)	Slightly decomposed plant material
horizon A(5cm to 15cm)	Very stony loam
horizon E(15cm to 33cm)	Very stony sandy loam
horizon Bt(33cm to 51cm)	Extremely stony sandy clay loam
horizon R(51cm to 61cm)	Unweathered bedrock



## Soil Information

Rock outcrop(15%)

horizon R(0cm to 152cm)

Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 381 - Needleton-Snowdon-Rock outcrop complex, 30 to 80 percent slopes

Component: Needleton (45%)

The Needleton component makes up 45 percent of the map unit. Slopes are 30 to 80 percent. This component is on mountain slopes. The parent material consists of slope alluvium and colluvium derived from rhyolite, limestone and sandstone. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 85 percent. Below this thin organic horizon the organic matter content is about 1 percent. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Snowdon (30%)

The Snowdon component makes up 30 percent of the map unit. Slopes are 30 to 80 percent. This component is on structural benches, mountain slopes. The parent material consists of residuum and slope alluvium derived from rhyolite, limestone and sandstone. Depth to a root restrictive layer, bedrock, lithic, is 10 to 20 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 85 percent. Below this thin organic horizon the organic matter content is about 2 percent. Nonirrigated land capability classification is 7s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface.

Component: Rock outcrop (15%)

Generated brief soil descriptions are created for major soil components. The Rock outcrop is a miscellaneous area.

Component: Horsethief (5%)

Generated brief soil descriptions are created for major soil components. The Horsethief soil is a minor component.

Component: Haviland (5%)

Generated brief soil descriptions are created for major soil components. The Haviland soil is a minor component.

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### Map Unit 495 (1.61%)

Map Unit Name: Riverwash

Bedrock Depth - Min:

Watertable Depth - Annual Min: 31cm

Drainage Class - Dominant:

Hydrologic Group - Dominant: D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Riverwash(85%)

horizon C1(0cm to 15cm)

Gravelly sand

horizon C2(15cm to 152cm)

Stratified extremely gravelly coarse sand to gravelly sand

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 495 - Riverwash

Component: Riverwash (85%)

Generated brief soil descriptions are created for major soil components. The Riverwash is a miscellaneous area.

Component: Fluvaquents (10%)

Generated brief soil descriptions are created for major soil components. The Fluvaquents soil is a minor component.

## Soil Information

Component: Cryaquolls (5%)

Generated brief soil descriptions are created for major soil components. The Cryaquolls soil is a minor component.

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### Map Unit 496 (19.08%)

Map Unit Name: Rock outcrop

Bedrock Depth - Min: 0cm

Watertable Depth - Annual Min:

Drainage Class - Dominant:

Hydrologic Group - Dominant: D - Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.

Major components are printed below

Rock outcrop(70%)

horizon R(0cm to 152cm) Unweathered bedrock

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 496 - Rock outcrop

Component: Rock outcrop (70%)

Generated brief soil descriptions are created for major soil components. The Rock outcrop is a miscellaneous area.

Component: Rubble land (20%)

Generated brief soil descriptions are created for major soil components. The Rubble land soil is a minor component.

Component: Lithic Cryorthents (10%)

Generated brief soil descriptions are created for major soil components. The Lithic Cryorthents soil is a minor component.

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### Map Unit 497 (4.96%)

Map Unit Name: Rubble land

Bedrock Depth - Min: 203cm

Watertable Depth - Annual Min:

Drainage Class - Dominant: Excessively drained

Hydrologic Group - Dominant: A - Soils in this group have low runoff potential when thoroughly wet. Water is transmitted freely through the soil.

Major components are printed below

Rubble land(80%)

horizon C(0cm to 152cm) Fragmental material

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 497 - Rubble land

Component: Rubble land (80%)

Generated brief soil descriptions are created for major soil components. The Rubble land is a miscellaneous area.

Component: Rock outcrop (10%)

Generated brief soil descriptions are created for major soil components. The Rock outcrop soil is a minor component.

Component: Varden (5%)

Generated brief soil descriptions are created for major soil components. The Varden soil is a minor component.

Component: Hensen (5%)

## Soil Information

Generated brief soil descriptions are created for major soil components. The Hensen soil is a minor component.

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### Map Unit 498 (0.25%)

Map Unit Name:	Slickens
Bedrock Depth - Min:	
Watertable Depth - Annual Min:	
Drainage Class - Dominant:	Somewhat excessively drained
Hydrologic Group - Dominant:	B - Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded.

Major components are printed below

Slickens(80%)	
horizon C(0cm to 152cm)	Fine sand

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 498 - Slickens

Component: Slickens (80%)

Generated brief soil descriptions are created for major soil components. The Slickens is a miscellaneous area.

Component: Rubble land (20%)

Generated brief soil descriptions are created for major soil components. The Rubble land soil is a minor component.

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### Map Unit 499 (0.05%)

Map Unit Name:	Water
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No more attributes available for this map unit

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 499 - Water

Component: Water (100%)

Generated brief soil descriptions are created for major soil components. The Water is a miscellaneous area.

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### Map Unit 53 (0.23%)

Map Unit Name:	Cryaquolls-Typic Cryaquents complex, 1 to 5 percent slopes
Bedrock Depth - Min:	
Watertable Depth - Annual Min:	32cm
Drainage Class - Dominant:	Poorly drained
Hydrologic Group - Dominant:	B/D - These soils have moderately low runoff potential when drained and high runoff potential when undrained.

Major components are printed below

Cryaquolls(50%)	
horizon A1(0cm to 18cm)	Loam
horizon A2(18cm to 30cm)	Loam
horizon C(30cm to 152cm)	Stratified extremely gravelly loam to extremely gravelly sandy loam
Typic Cryaquents(35%)	
horizon Oi(0cm to 8cm)	Slightly decomposed plant material

## Soil Information

horizon A(8cm to 28cm)  
horizon C(28cm to 160cm)

Loam  
Stratified very gravelly loamy sand to very gravelly sandy loam

### Component Description:

Minor map unit components are excluded from this report.

Map Unit: 53 - Cryaquolls-Typic Cryaquents complex, 1 to 5 percent slopes

#### Component: Cryaquolls (50%)

The Cryaquolls component makes up 50 percent of the map unit. Slopes are 1 to 5 percent. This component is on valley floors, flood plains. The parent material consists of alluvium derived from mixed sources. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is occasionally flooded. It is not ponded. A seasonal zone of water saturation is at 13 inches during May, June. Organic matter content in the surface horizon is about 4 percent. This component is in the R048AY241CO Mountain Meadow ecological site. Nonirrigated land capability classification is 6w. This soil meets hydric criteria.

#### Component: Typic Cryaquents (35%)

The Typic Cryaquents component makes up 35 percent of the map unit. Slopes are 1 to 5 percent. This component is on valley floors, flood plains. The parent material consists of alluvium derived from mixed sources. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is occasionally flooded. It is not ponded. A seasonal zone of water saturation is at 13 inches (depth from the mineral surface is 9 inches) during May, June. Organic matter content in the surface horizon is about 85 percent. Below this thin organic horizon the organic matter content is about 1 percent. This component is in the R048AY241CO Mountain Meadow ecological site. Nonirrigated land capability classification is 6w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface.

#### Component: Quazar (10%)

Generated brief soil descriptions are created for major soil components. The Quazar soil is a minor component.

#### Component: Howardsville (4%)

Generated brief soil descriptions are created for major soil components. The Howardsville soil is a minor component.

#### Component: Riverwash (1%)

Generated brief soil descriptions are created for major soil components. The Riverwash soil is a minor component.

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### Map Unit 54 (1.45%)

Map Unit Name: Quazar very cobbly loam, 5 to 25 percent slopes

Bedrock Depth - Min:

Watertable Depth - Annual Min:

Drainage Class - Dominant: Well drained

Hydrologic Group - Dominant: B - Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded.

Major components are printed below

#### Quazar(90%)

horizon A1(0cm to 8cm)	Very cobbly loam
horizon A2(8cm to 30cm)	Very cobbly loam
horizon Bt(30cm to 66cm)	Extremely gravelly clay loam
horizon C(66cm to 152cm)	Extremely gravelly clay loam

### Component Description:

Minor map unit components are excluded from this report.

Map Unit: 54 - Quazar very cobbly loam, 5 to 25 percent slopes

#### Component: Quazar (90%)

The Quazar component makes up 90 percent of the map unit. Slopes are 5 to 25 percent. This component is on alluvial fans. The parent material consists of alluvium derived from volcanic rock. Depth to a root restrictive layer is greater than 60 inches. The natural

## Soil Information

drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. This component is in the R048AY250CO Subalpine Loam ecological site. Nonirrigated land capability classification is 7s. This soil does not meet hydric criteria.

Component: Needleton (5%)

Generated brief soil descriptions are created for major soil components. The Needleton soil is a minor component.

Component: Clayburn (3%)

Generated brief soil descriptions are created for major soil components. The Clayburn soil is a minor component.

Component: Hourglass (2%)

Generated brief soil descriptions are created for major soil components. The Hourglass soil is a minor component.

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### Map Unit 56 (0.2%)

Map Unit Name:	Typic Cryaquents-Cryaquolls-Cryofibrists complex, 0 to 5 percent slopes
Bedrock Depth - Min:	
Watertable Depth - Annual Min:	32cm
Drainage Class - Dominant:	Very poorly drained
Hydrologic Group - Dominant:	B/D - These soils have moderately low runoff potential when drained and high runoff potential when undrained.

Major components are printed below

#### Typic Cryaquents(35%)

horizon Oi(0cm to 8cm)	Slightly decomposed plant material
horizon A(8cm to 28cm)	Loam
horizon C(28cm to 160cm)	Stratified very gravelly sandy loam to very gravelly loamy sand

#### Cryaquolls(30%)

horizon A1(0cm to 18cm)	Loam
horizon A2(18cm to 30cm)	Loam
horizon C(30cm to 152cm)	Stratified extremely gravelly loam to extremely gravelly sandy loam

#### Cryofibrists(25%)

horizon Oi1(0cm to 25cm)	Peat
horizon Oi2(25cm to 76cm)	Peat
horizon Oa(76cm to 152cm)	Muck

Component Description:

Minor map unit components are excluded from this report.

Map Unit: 56 - Typic Cryaquents-Cryaquolls-Cryofibrists complex, 0 to 5 percent slopes

#### Component: Typic Cryaquents (35%)

The Typic Cryaquents component makes up 35 percent of the map unit. Slopes are 0 to 5 percent. This component is on flood plains, valley floors, depressions on mesas. The parent material consists of alluvium derived from mixed sources. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is occasionally flooded. It is not ponded. A seasonal zone of water saturation is at 13 inches (depth from the mineral surface is 9 inches) during May, June. Organic matter content in the surface horizon is about 85 percent. Below this thin organic horizon the organic matter content is about 1 percent. This component is in the R048AY305CO Alpine Meadow ecological site. Nonirrigated land capability classification is 6w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface.

#### Component: Cryaquolls (30%)

The Cryaquolls component makes up 30 percent of the map unit. Slopes are 1 to 5 percent. This component is on depressions on mesas, valley floors, flood plains. The parent material consists of alluvium derived from mixed sources. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is occasionally flooded. It is not ponded. A seasonal zone of water saturation is at 13 inches during May, June. Organic matter content in the surface horizon is about 4 percent. This component is in the R048AY305CO Alpine Meadow ecological site. Nonirrigated land capability classification



## Soil Information

is 6w. This soil meets hydric criteria.

### Component: Cryofibrists (25%)

The Cryofibrists component makes up 25 percent of the map unit. Slopes are 0 to 5 percent. This component is on drainageways, depressions on mesas, flood plains. The parent material consists of organic material. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very high. Shrink-swell potential is low. This soil is frequently flooded. It is not ponded. A seasonal zone of water saturation is at 18 inches during January, February, March, April, May, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 73 percent. This component is in the R048AY305CO Alpine Meadow ecological site. Nonirrigated land capability classification is 6w. This soil meets hydric criteria.

### Component: Quazar (5%)

Generated brief soil descriptions are created for major soil components. The Quazar soil is a minor component.

### Component: Whitecross (2%)

Generated brief soil descriptions are created for major soil components. The Whitecross soil is a minor component.

### Component: Henson (2%)

Generated brief soil descriptions are created for major soil components. The Henson soil is a minor component.

### Component: Howardsville (1%)

Generated brief soil descriptions are created for major soil components. The Howardsville soil is a minor component.

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### Map Unit 57 (1.6%)

Map Unit Name: Howardsville gravelly loam, 1 to 6 percent slopes

Bedrock Depth - Min:

Watertable Depth - Annual Min:

Drainage Class - Dominant: Well drained

Hydrologic Group - Dominant: B - Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded.

Major components are printed below

#### Howardsville(80%)

horizon A(0cm to 5cm)	Gravelly loam
horizon Bw(5cm to 25cm)	Very gravelly sandy loam
horizon C(25cm to 152cm)	Extremely cobbly loamy sand

### Component Description:

Minor map unit components are excluded from this report.

Map Unit: 57 - Howardsville gravelly loam, 1 to 6 percent slopes

### Component: Howardsville (80%)

The Howardsville component makes up 80 percent of the map unit. Slopes are 1 to 6 percent. This component is on fan remnants, stream terraces. The parent material consists of alluvium derived from volcanic rock. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the R048AY251CO Shallow Subalpine ecological site. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria.

### Component: Quazar (10%)

Generated brief soil descriptions are created for major soil components. The Quazar soil is a minor component.

### Component: Cryaquolls (5%)

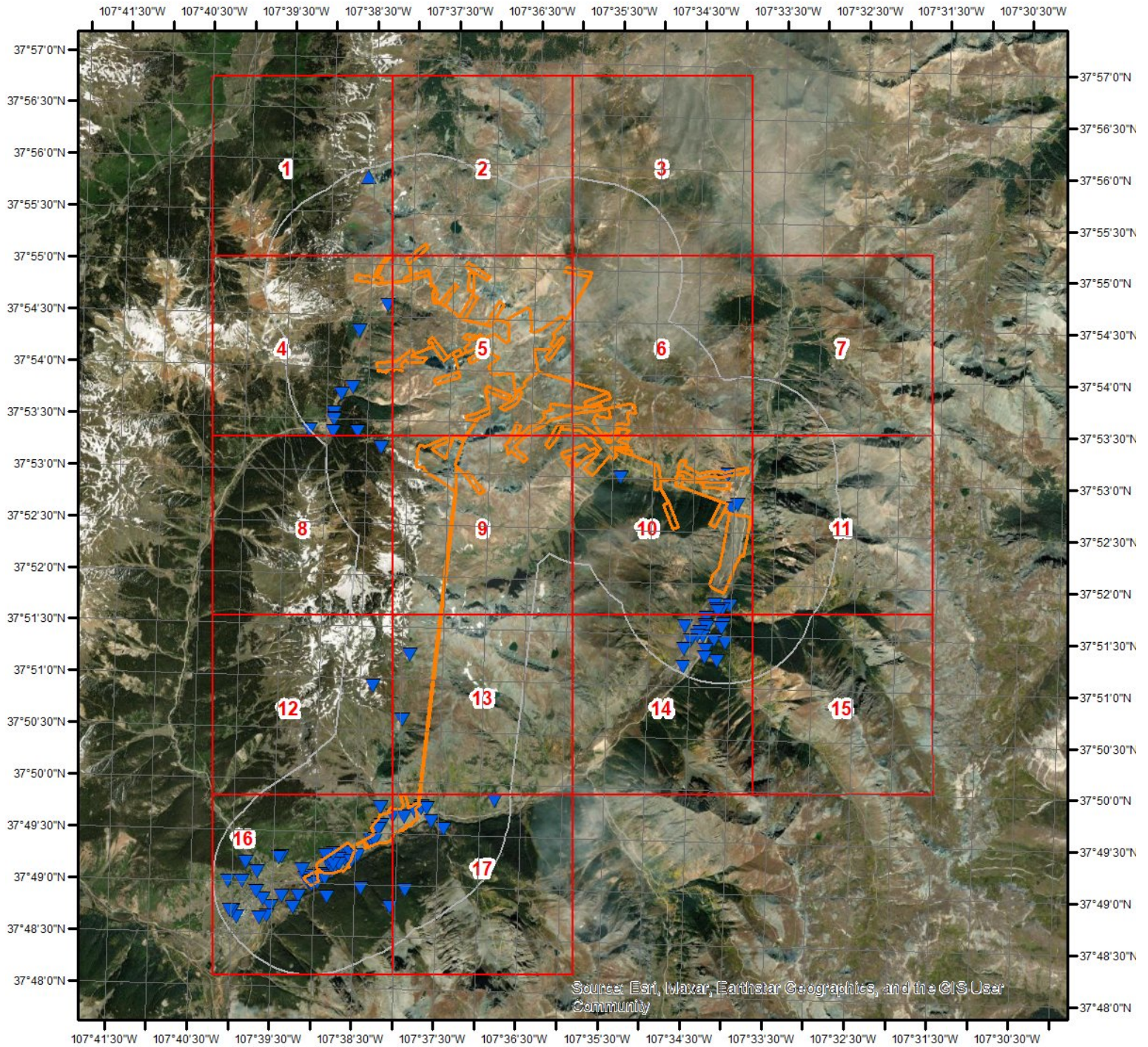
Generated brief soil descriptions are created for major soil components. The Cryaquolls soil is a minor component.

### Component: Needleton (5%)

Generated brief soil descriptions are created for major soil components. The Needleton soil is a minor component.



## Wells and Additional Sources



## Wells & Additional Sources



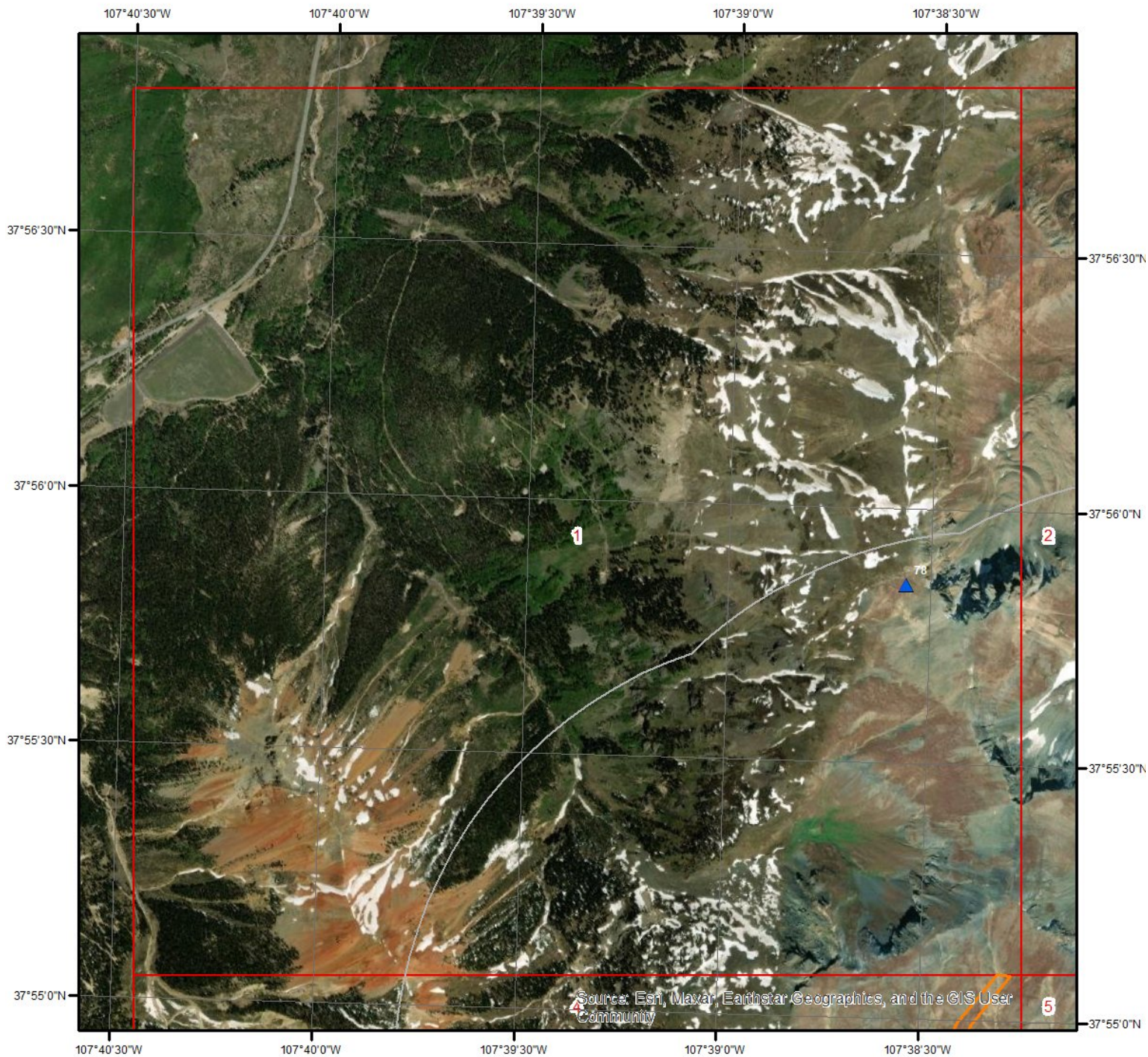
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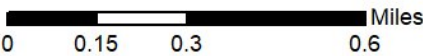




Wells and Additional Sources



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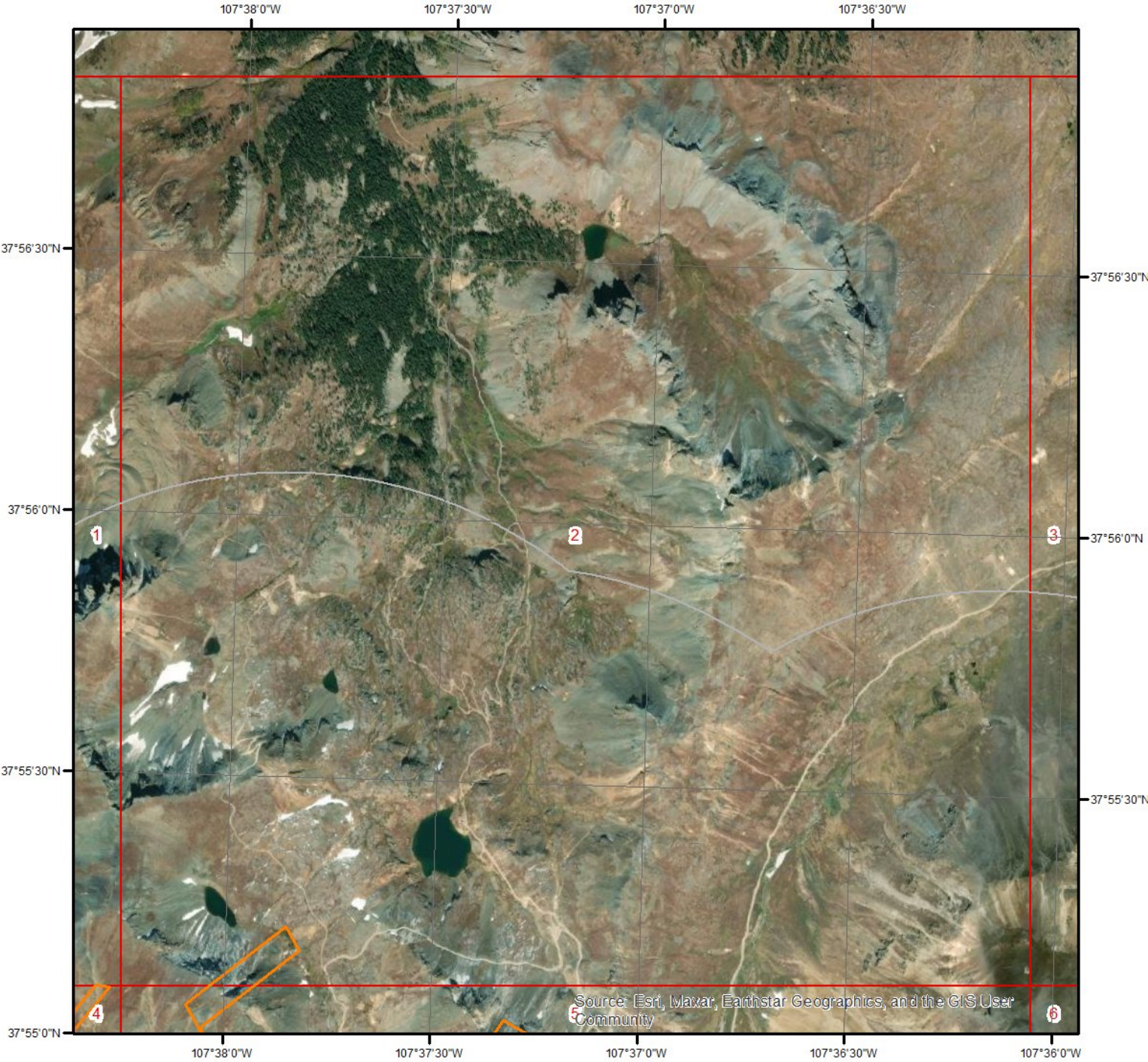


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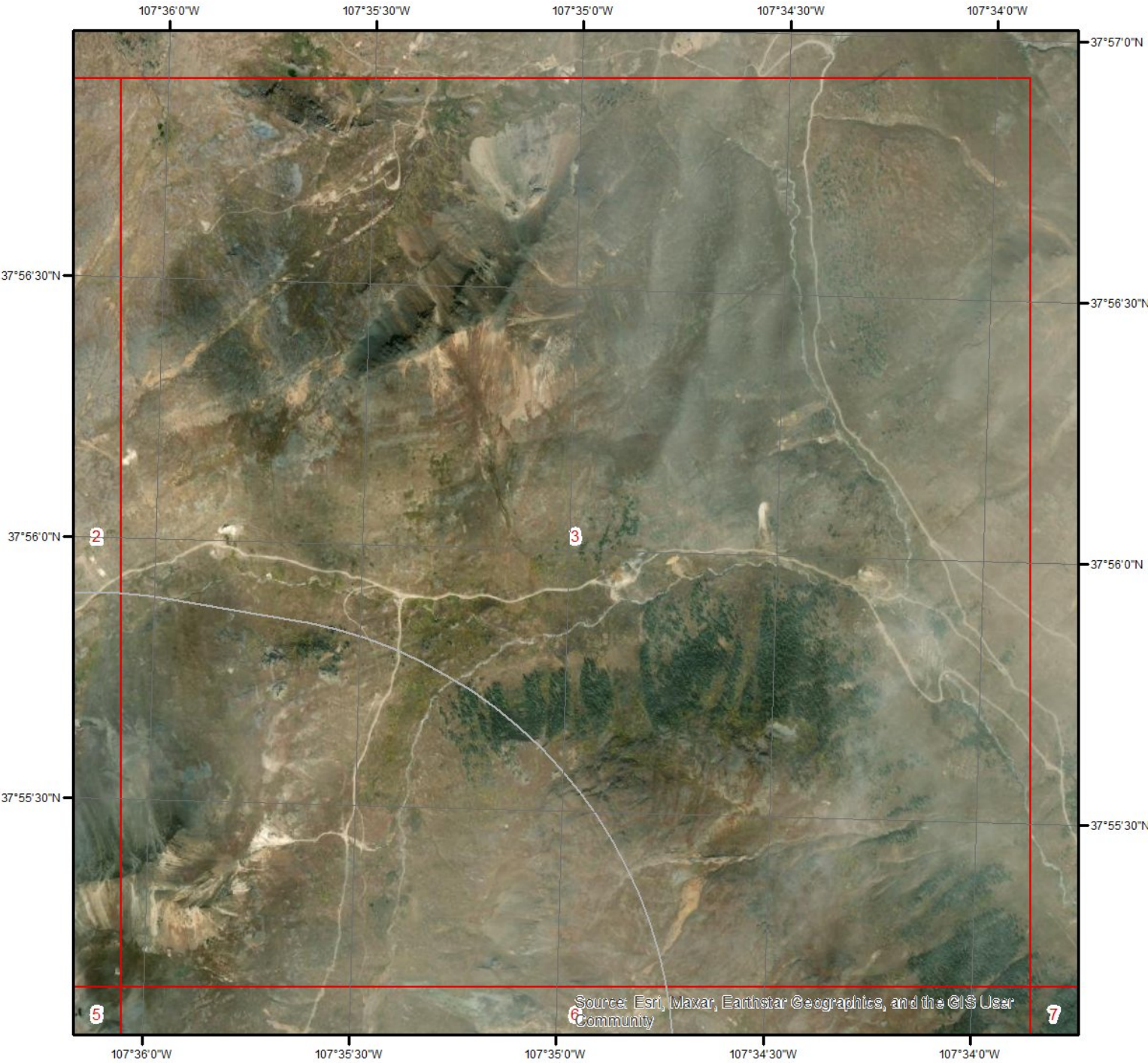


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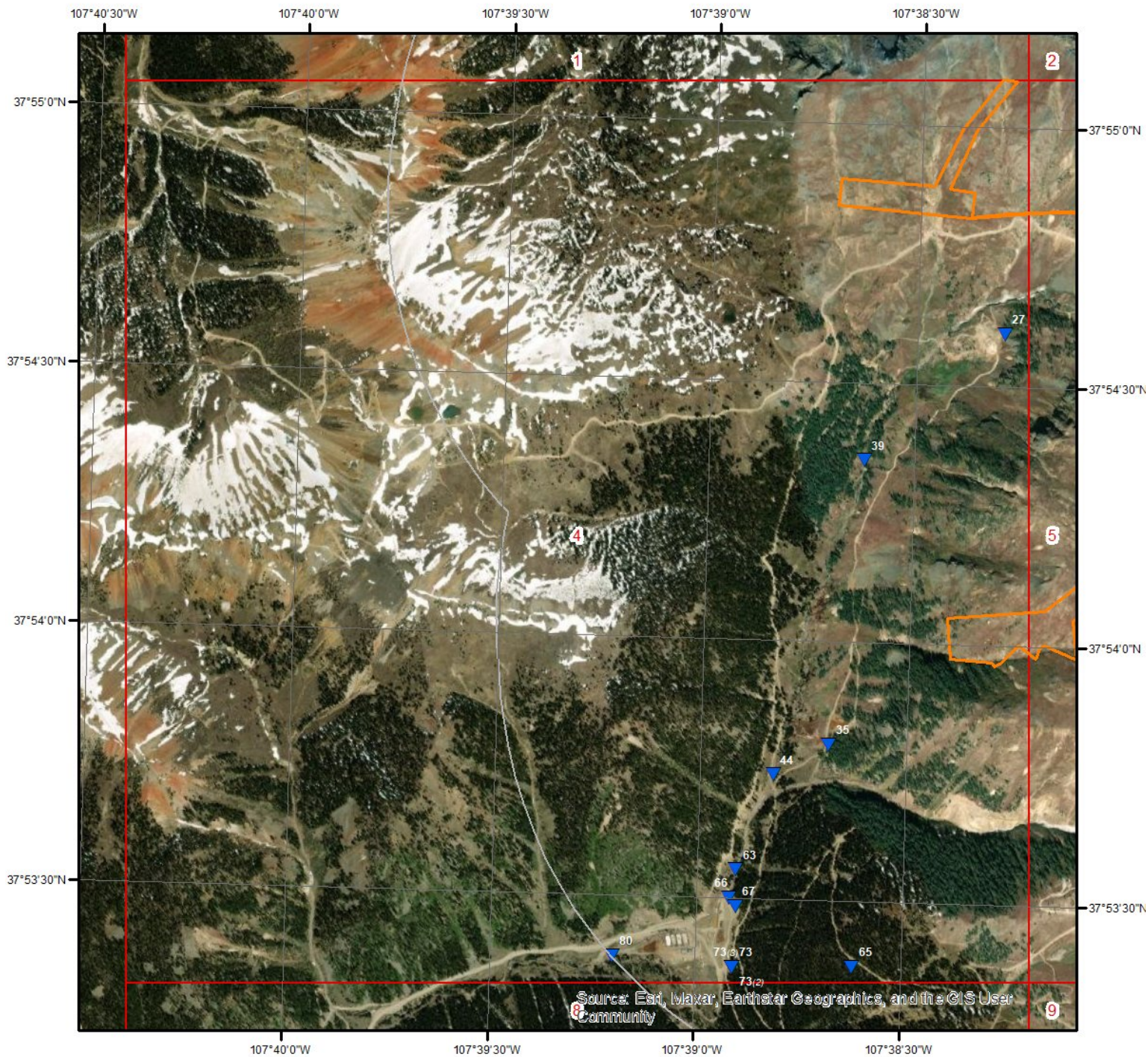


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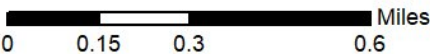




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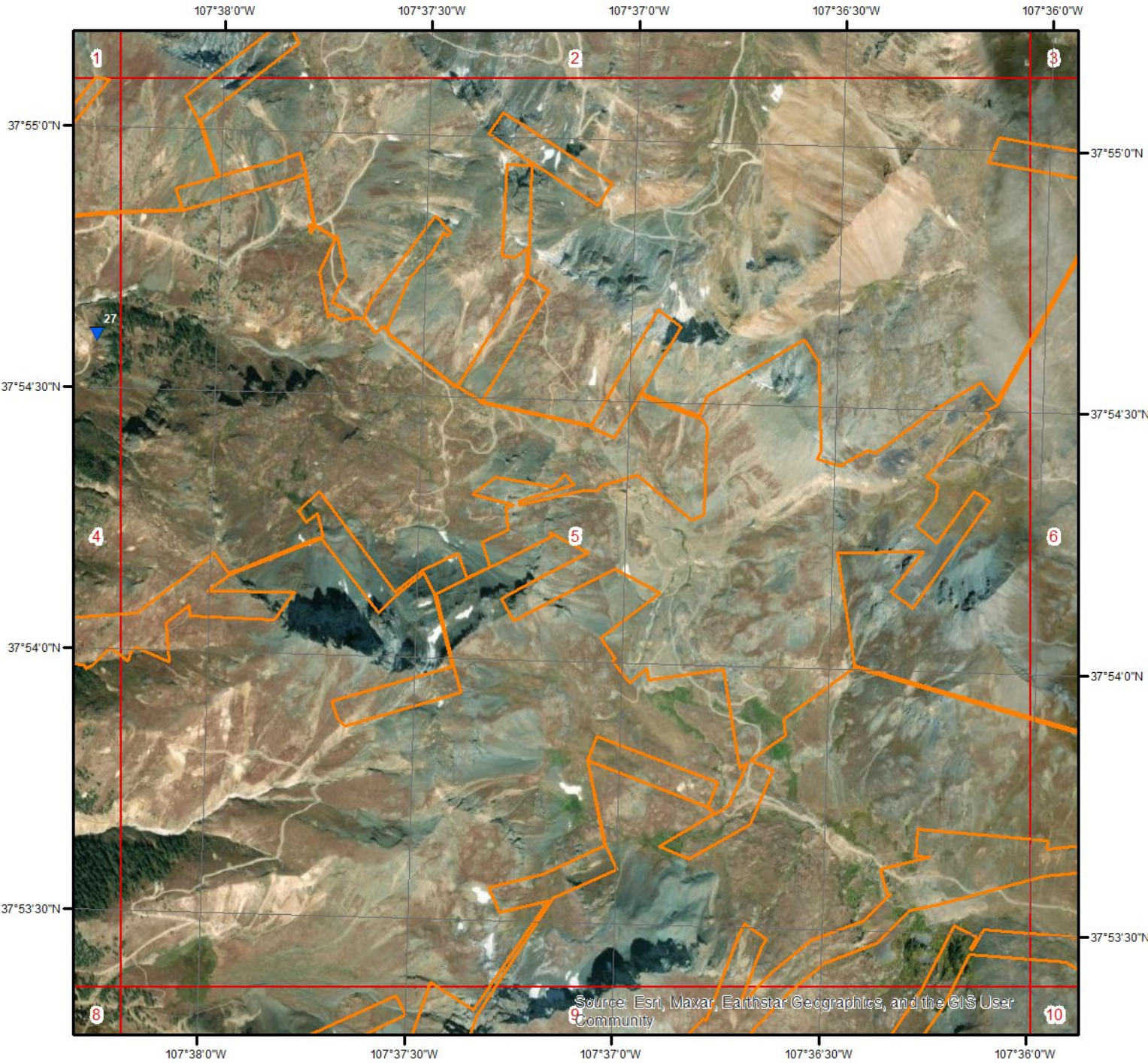


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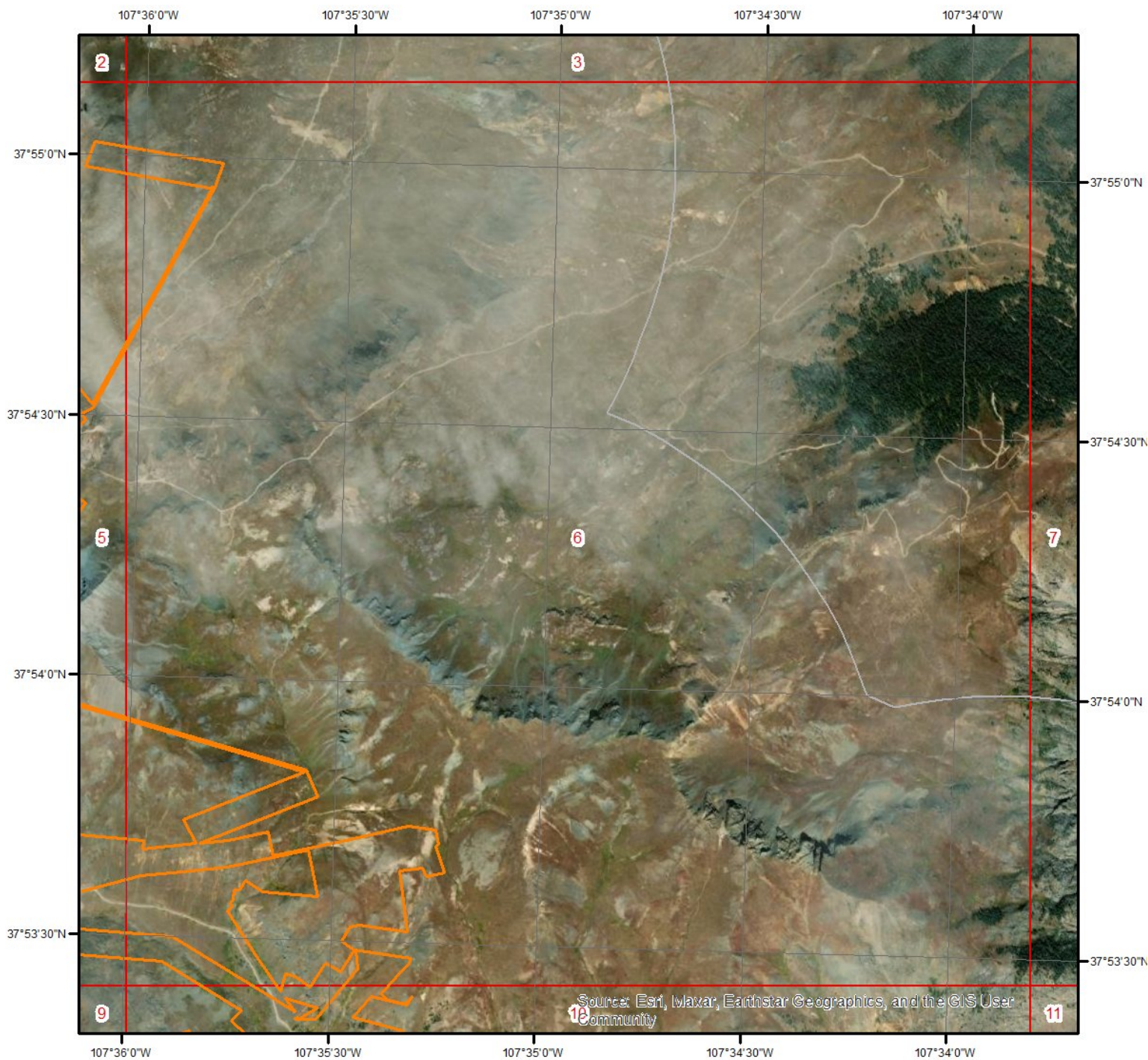


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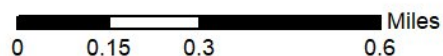




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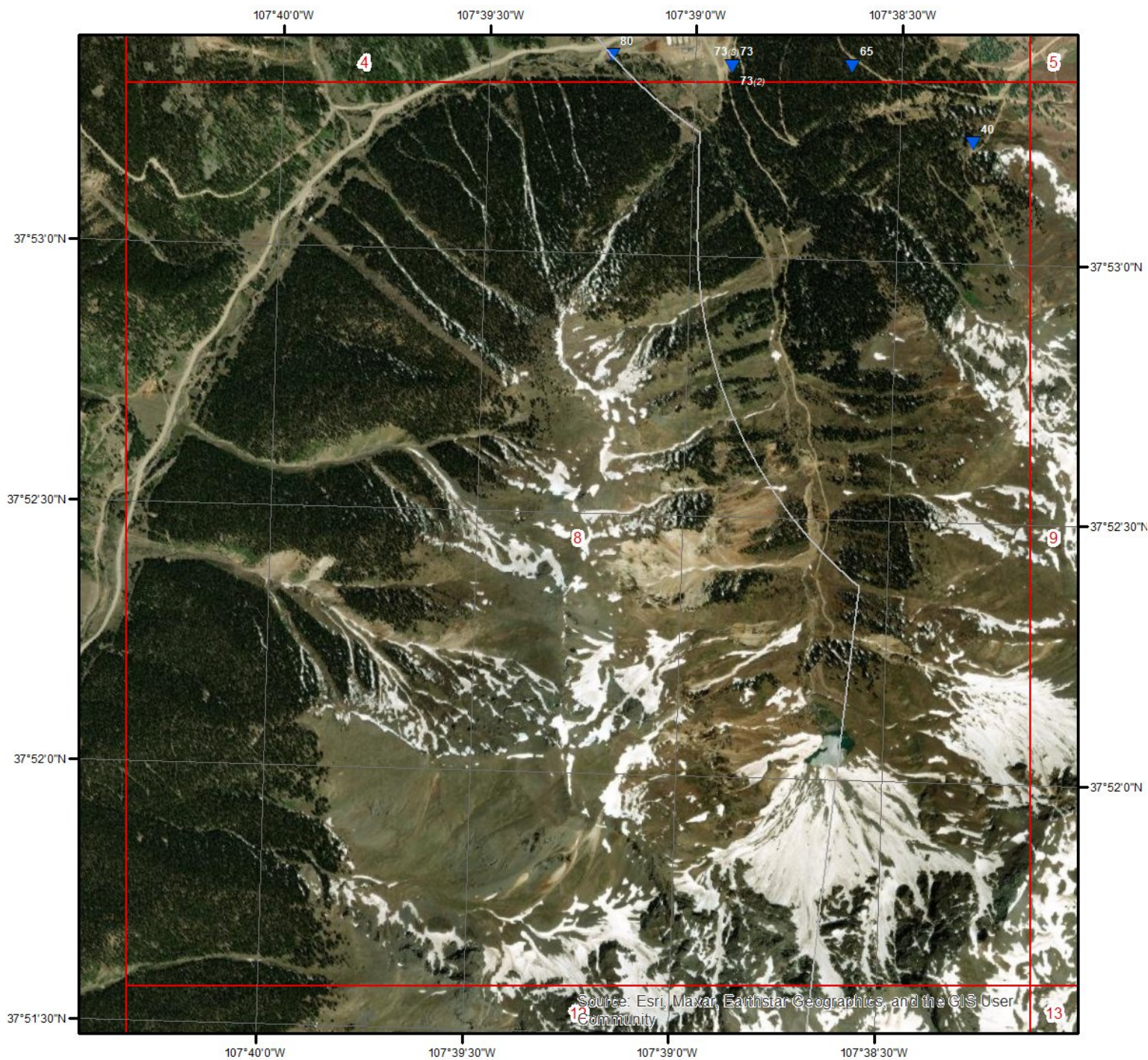


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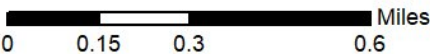




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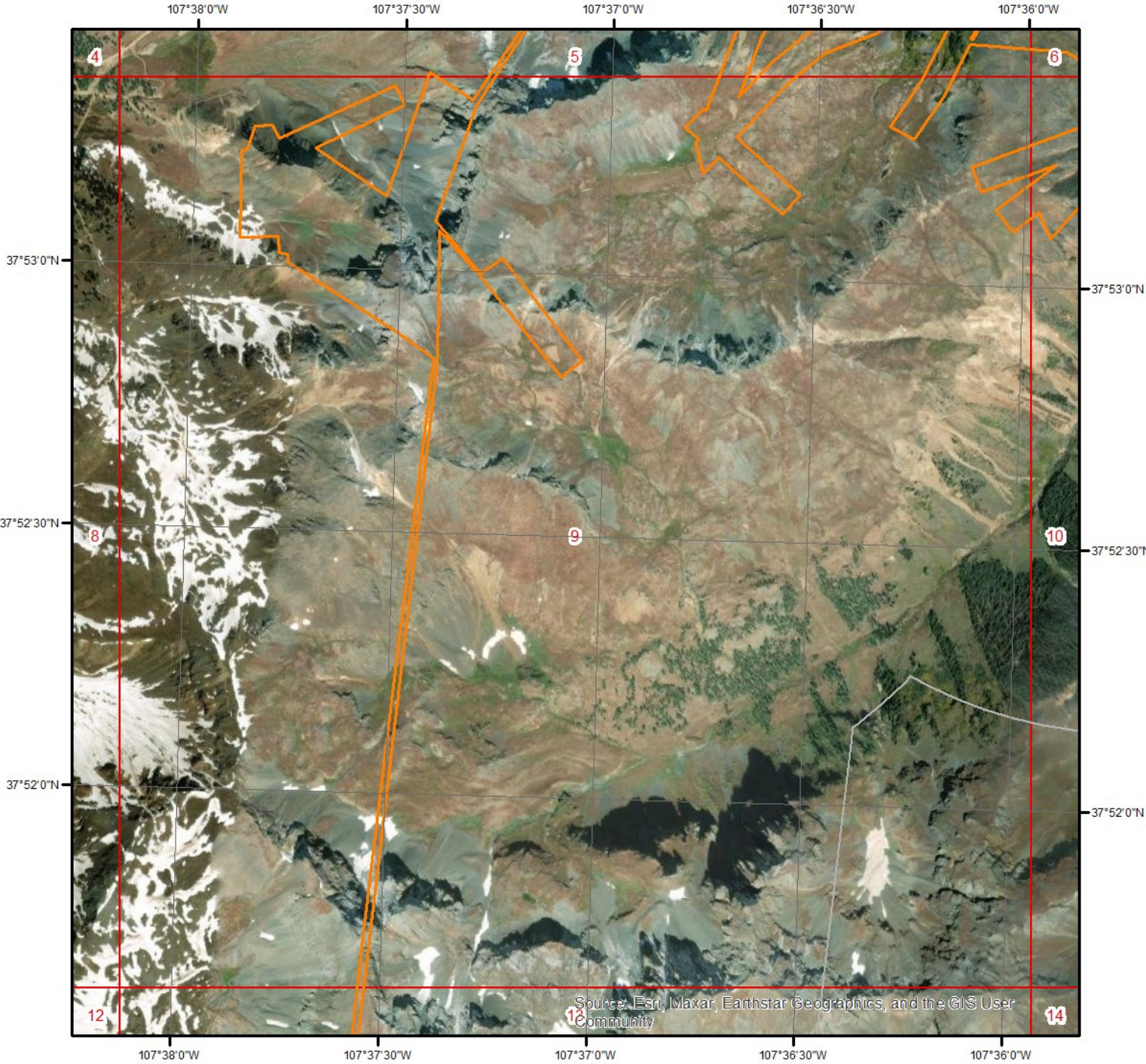


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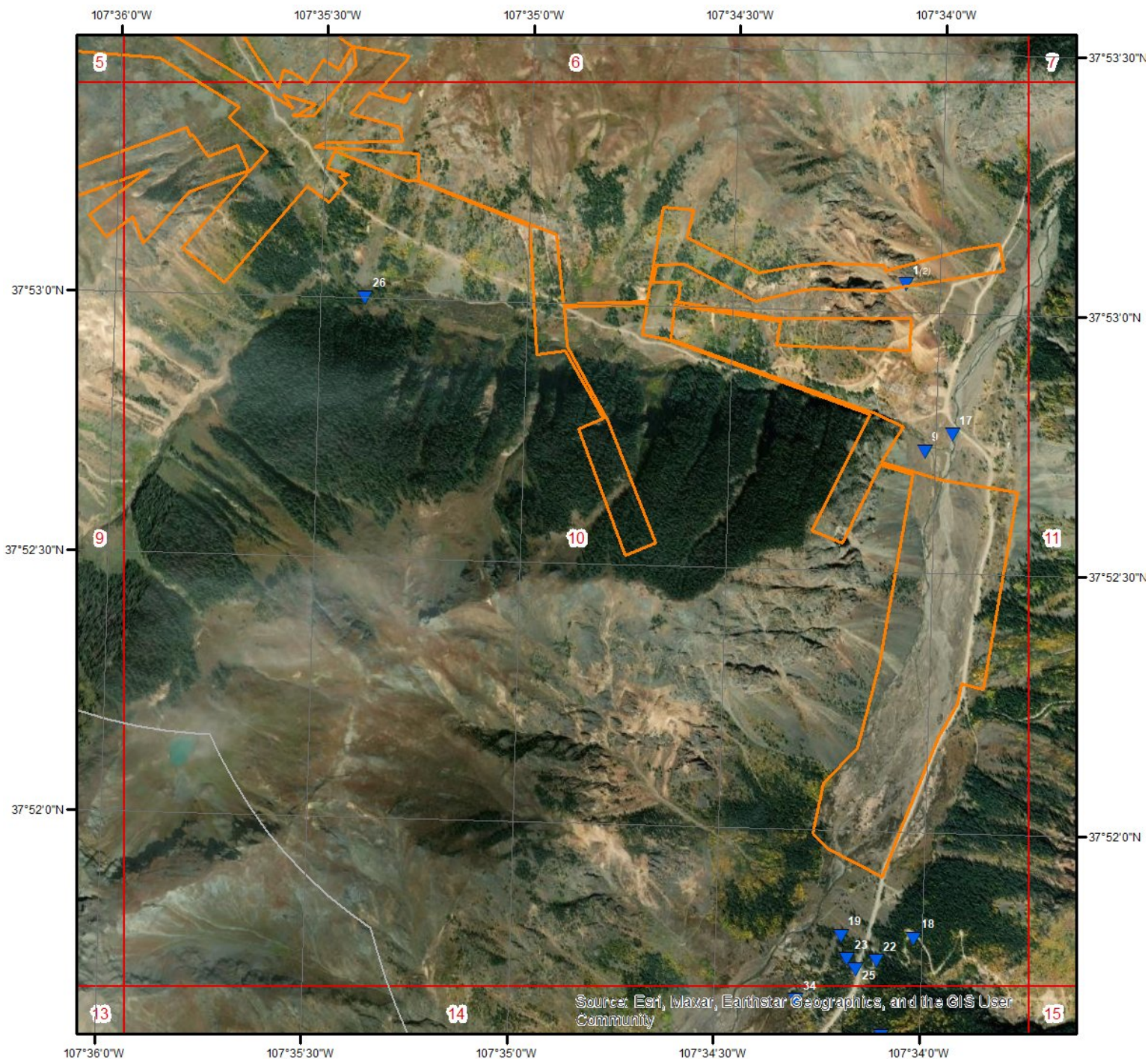


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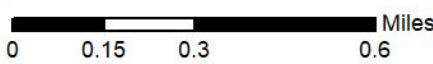




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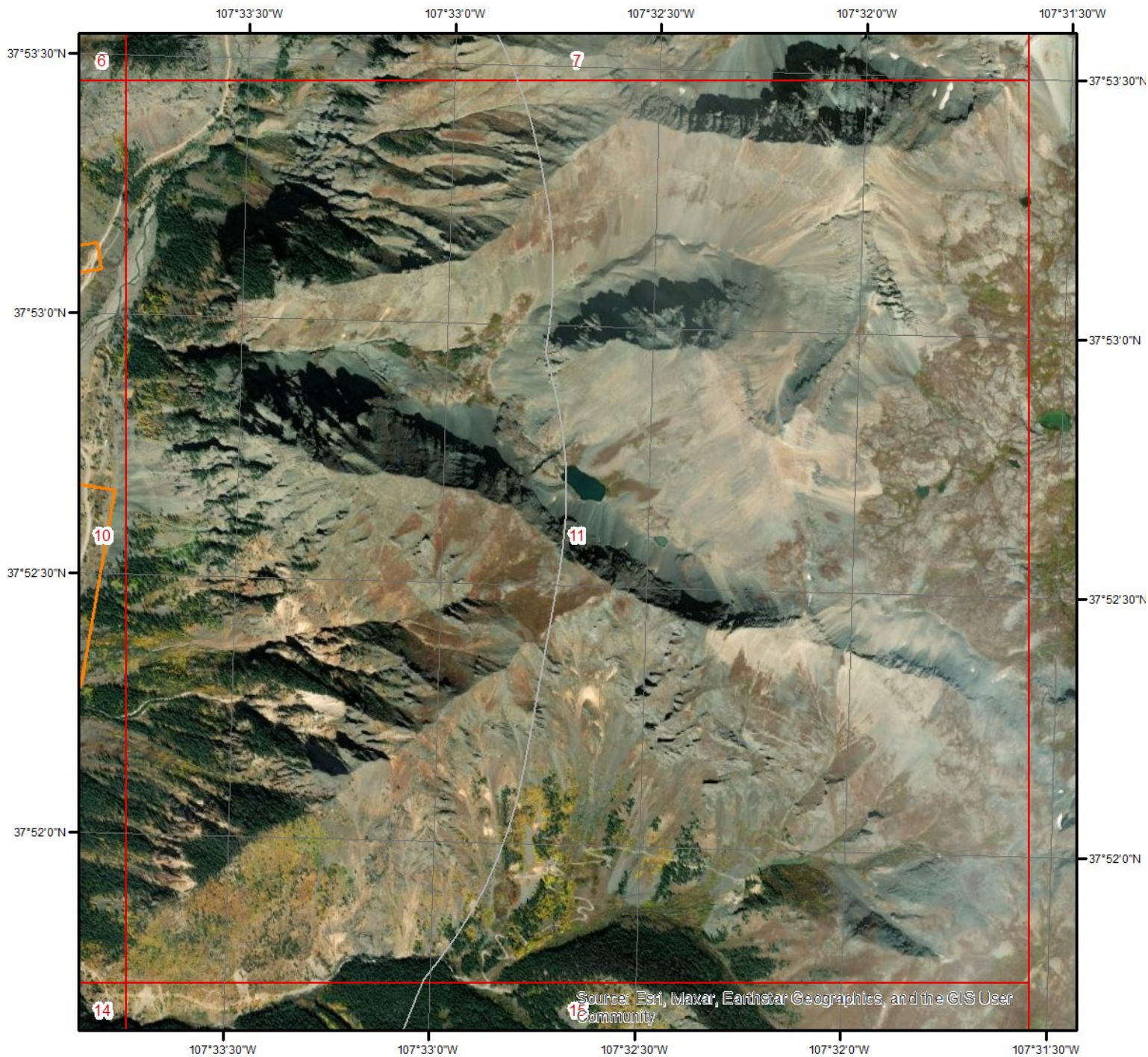


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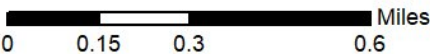




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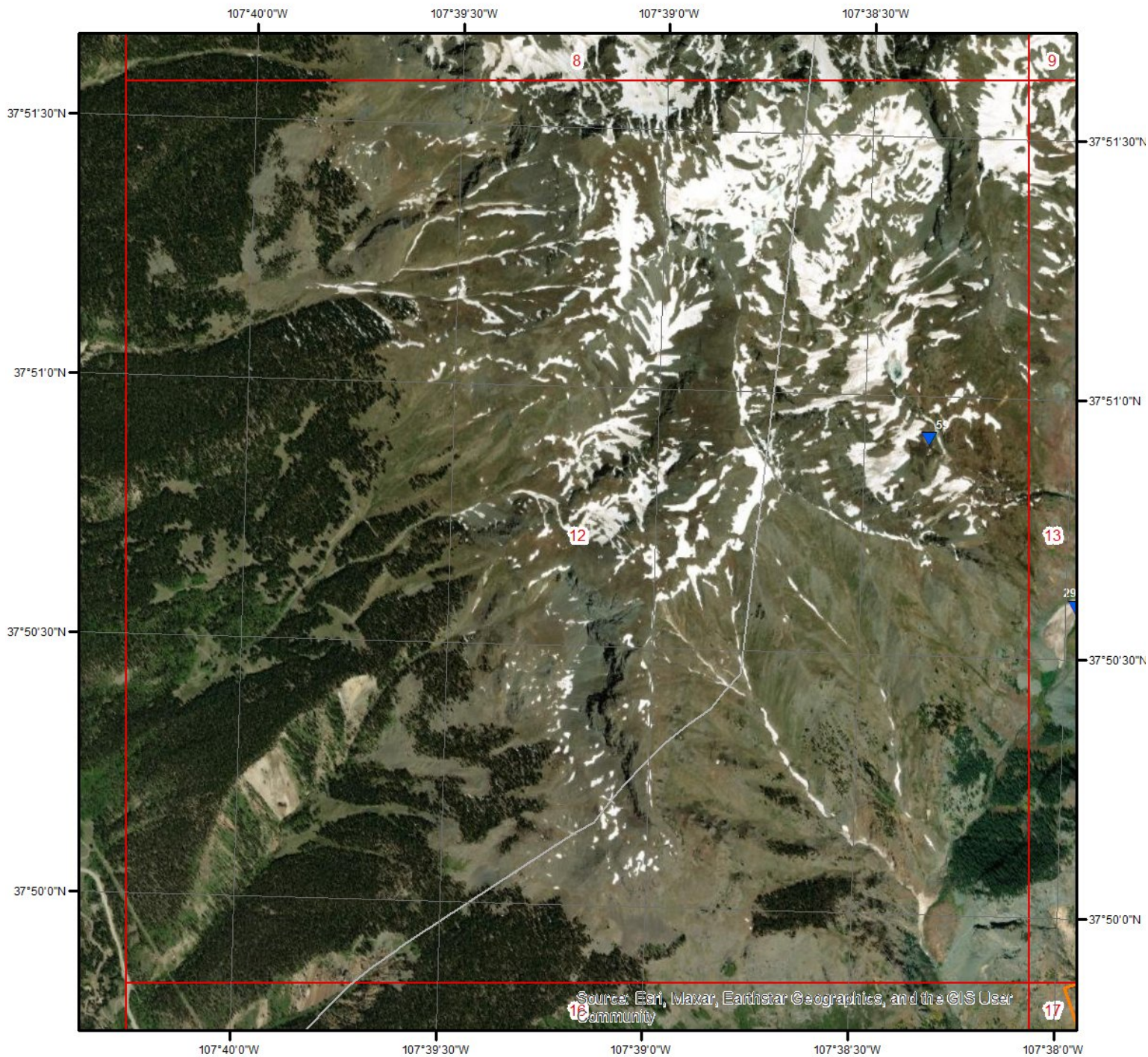


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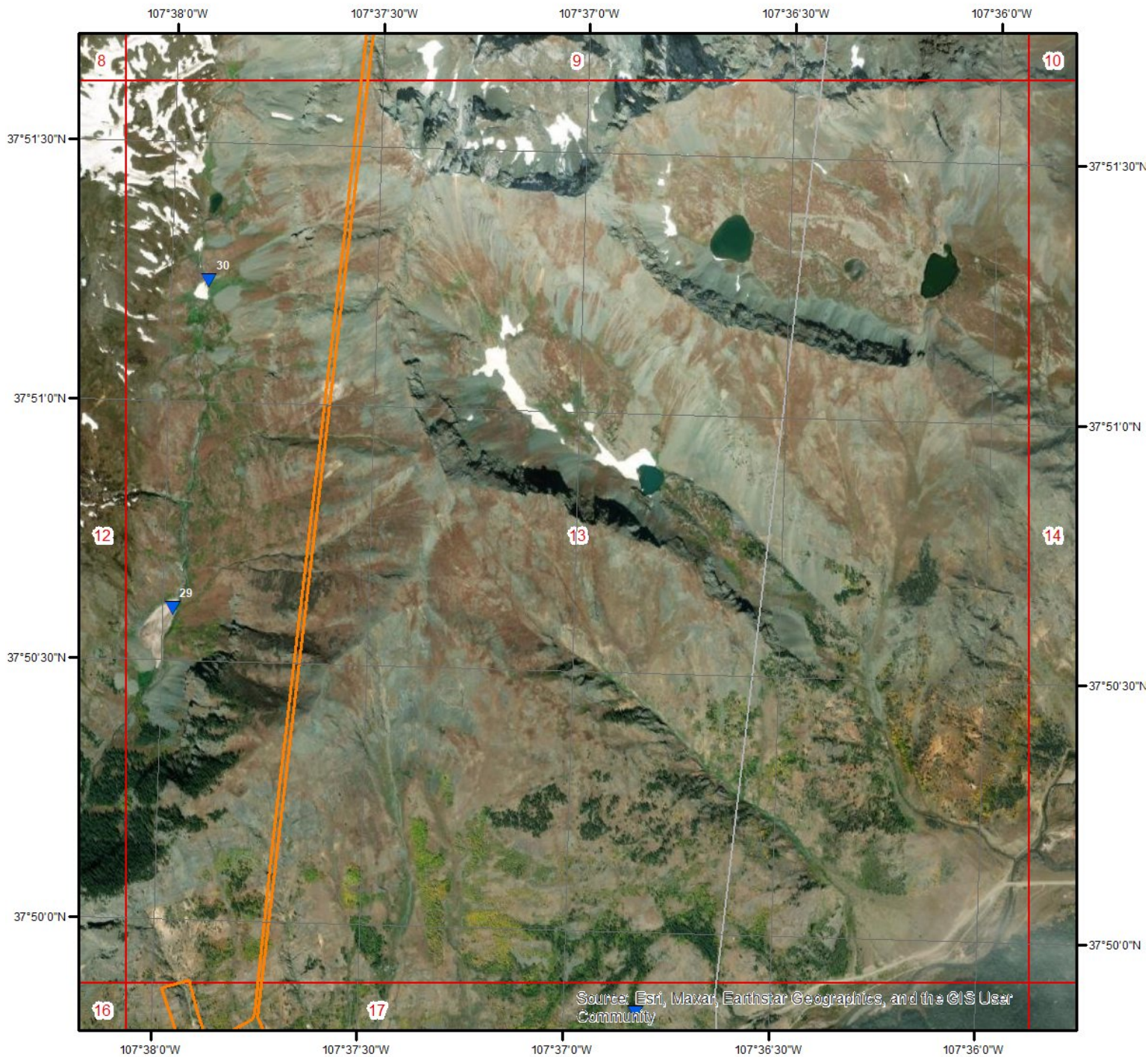
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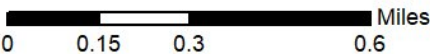




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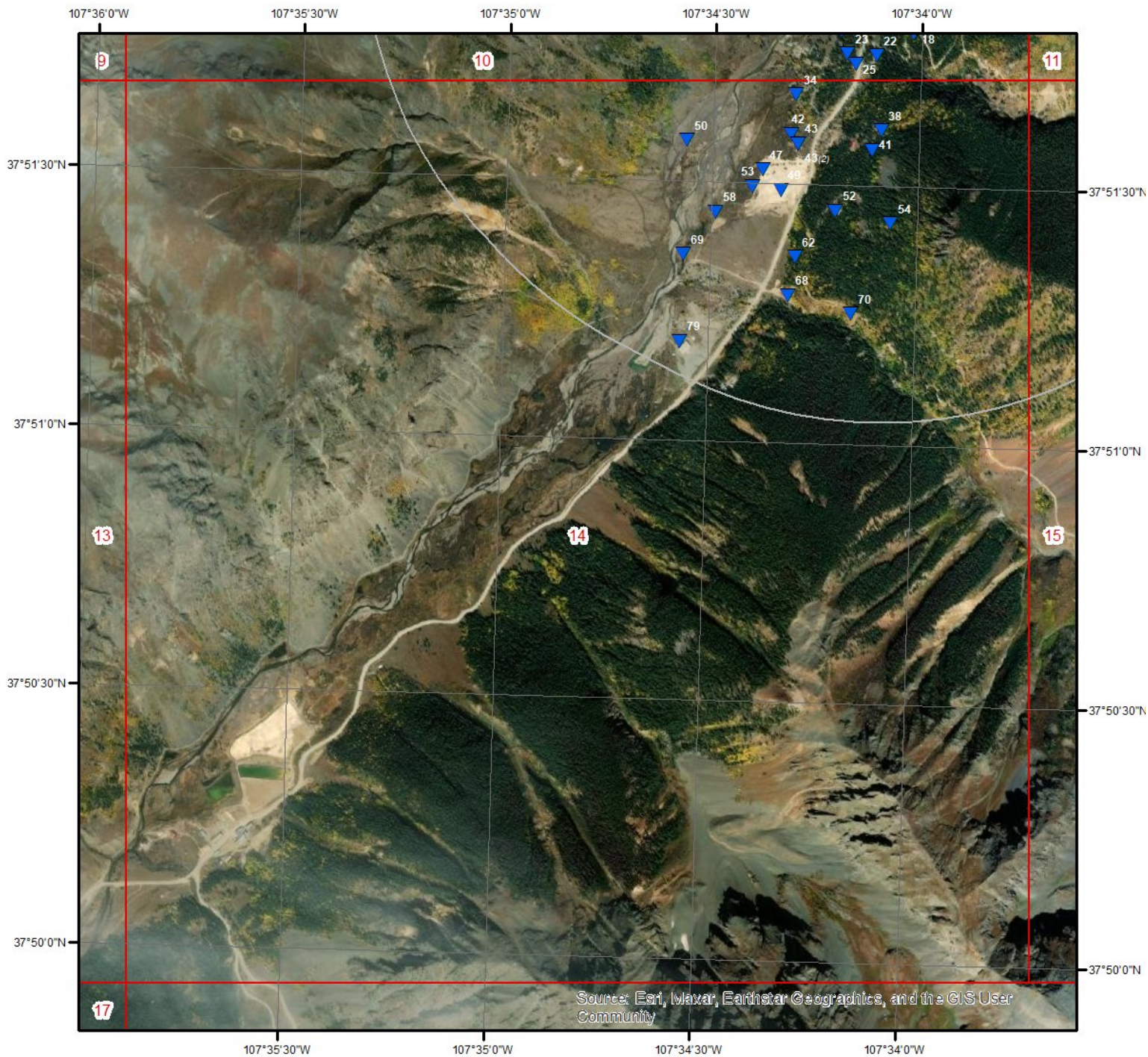


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| ▼ Sites with Lower Elevation   | ▼ OGW Sites with Lower Elevation   |
| ○ Sites with Unknown Elevation | ● OGW Sites with Unknown Elevation |

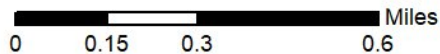




Wells and Additional Sources



Wells & Additional Sources - Page 14

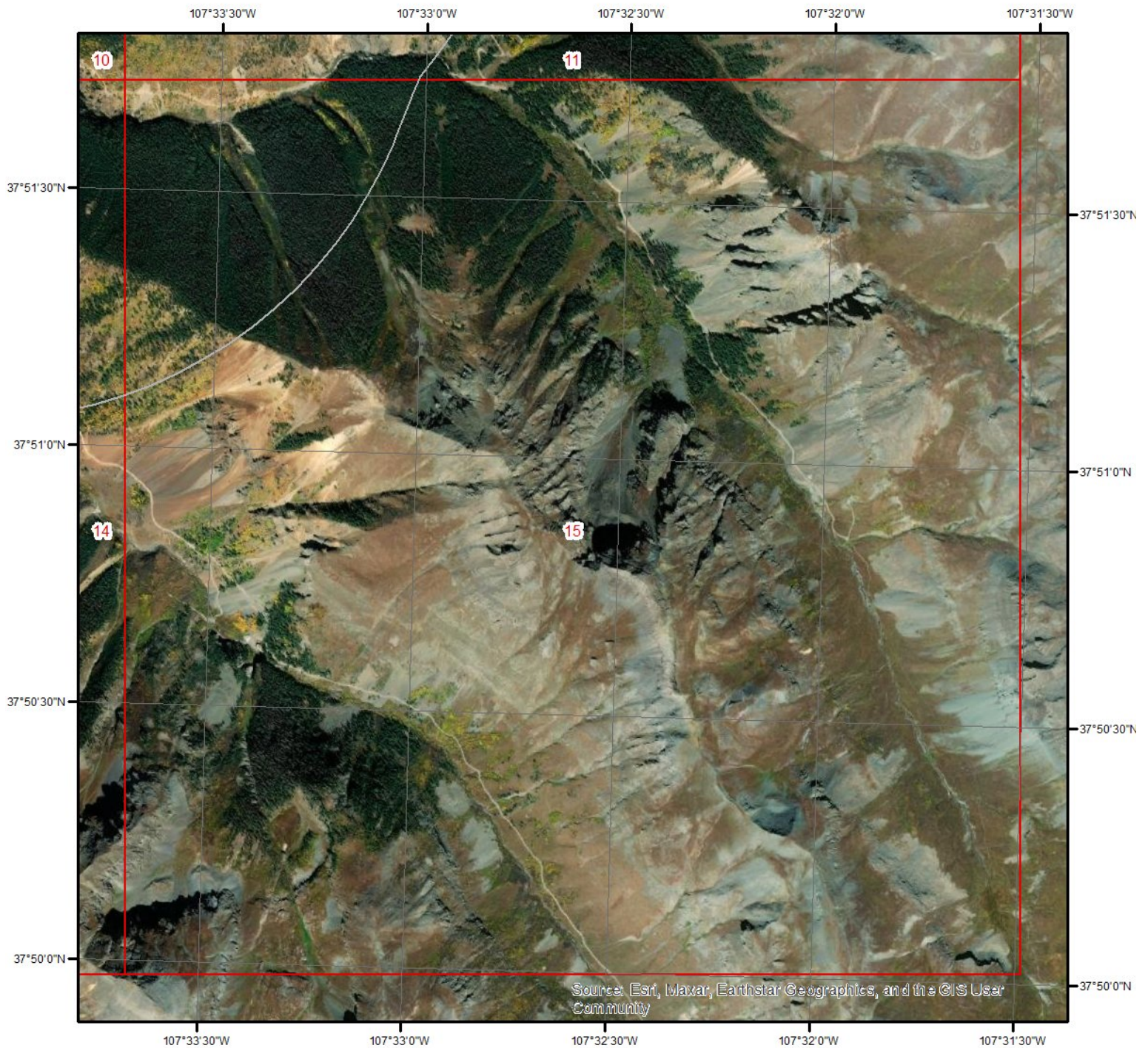


- |                                |                                    |
|--------------------------------|------------------------------------|
| ▲ Sites with Higher Elevation  | ▲ OGW Sites with Higher Elevation  |
| ■ Sites with Same Elevation    | ■ OGW Sites with Same Elevation    |
| ▼ Sites with Lower Elevation   | ▼ OGW Sites with Lower Elevation   |
| ○ Sites with Unknown Elevation | ● OGW Sites with Unknown Elevation |

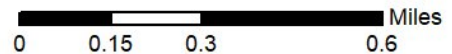




Wells and Additional Sources



Wells & Additional Sources - Page 15

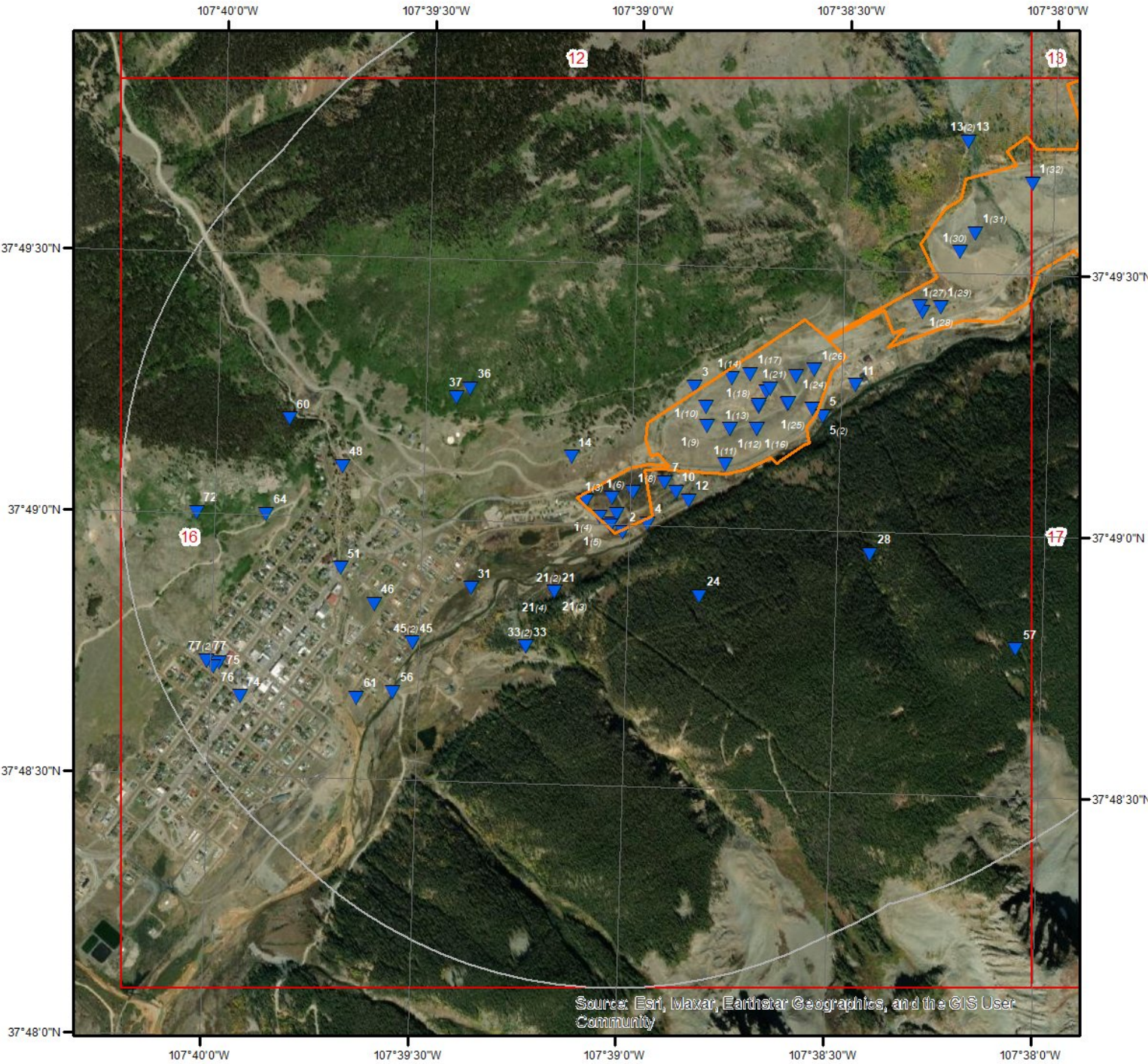


- |                                |                                    |
|--------------------------------|------------------------------------|
| ▲ Sites with Higher Elevation  | ▲ OGW Sites with Higher Elevation  |
| ■ Sites with Same Elevation    | ■ OGW Sites with Same Elevation    |
| ▼ Sites with Lower Elevation   | ▼ OGW Sites with Lower Elevation   |
| ○ Sites with Unknown Elevation | ● OGW Sites with Unknown Elevation |





Wells and Additional Sources



Wells & Additional Sources - Page 16

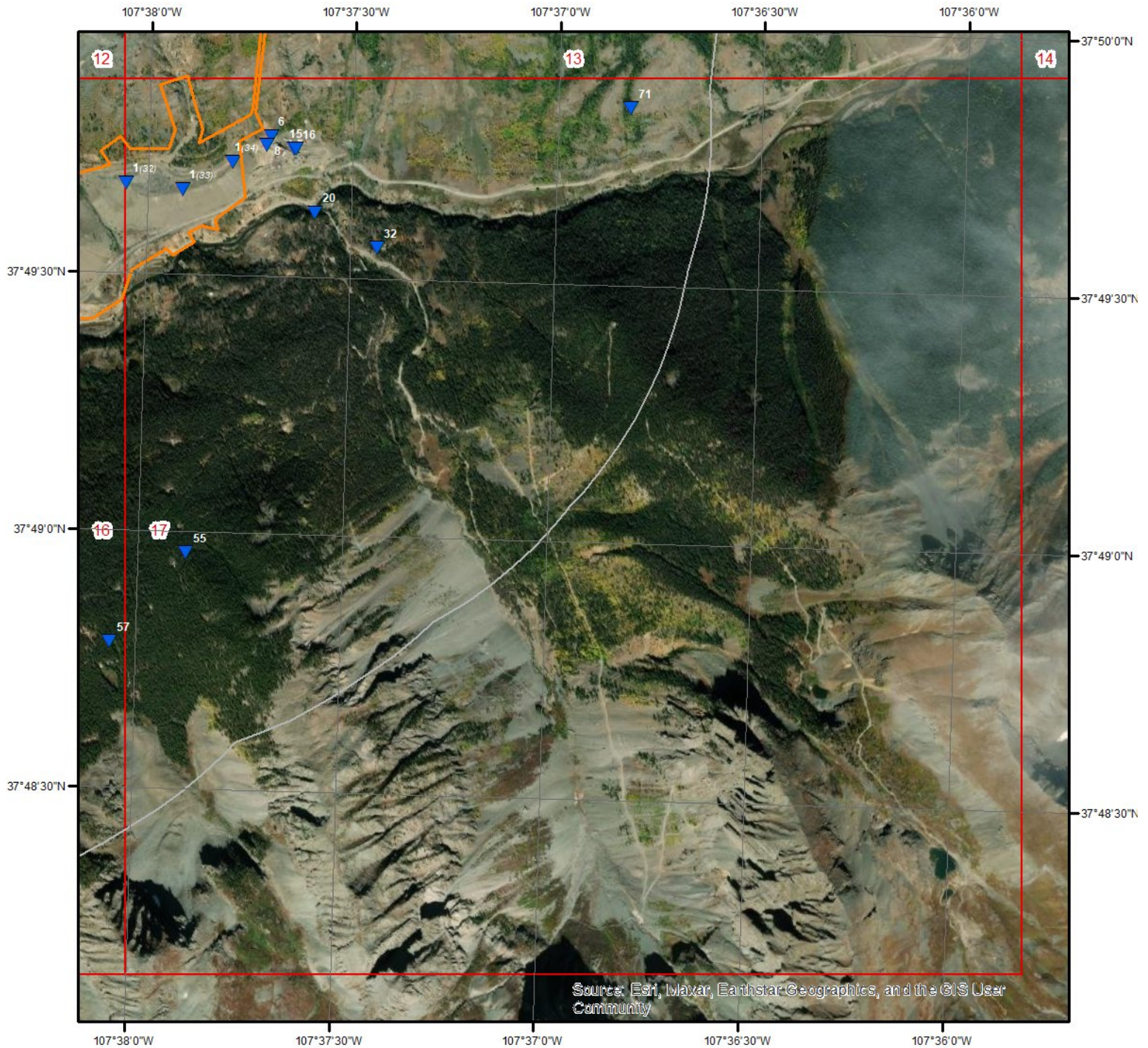


- |                                |                                    |
|--------------------------------|------------------------------------|
| ▲ Sites with Higher Elevation  | ▲ OGW Sites with Higher Elevation  |
| ■ Sites with Same Elevation    | ■ OGW Sites with Same Elevation    |
| ▼ Sites with Lower Elevation   | ▼ OGW Sites with Lower Elevation   |
| ○ Sites with Unknown Elevation | ● OGW Sites with Unknown Elevation |





## Wells and Additional Sources



### Wells & Additional Sources - Page 17



0 0.15 0.3 0.6 Miles

- |                                |                                    |
|--------------------------------|------------------------------------|
| ▲ Sites with Higher Elevation  | ▲ OGW Sites with Higher Elevation  |
| ■ Sites with Same Elevation    | ■ OGW Sites with Same Elevation    |
| ▼ Sites with Lower Elevation   | ▼ OGW Sites with Lower Elevation   |
| ○ Sites with Unknown Elevation | ● OGW Sites with Unknown Elevation |



## Wells and Additional Sources Summary

### Federal Sources

#### Public Water Systems Violations and Enforcement Data

Map Key	ID	Distance (ft)	Direction
No records found			

#### Safe Drinking Water Information System (SDWIS)

Map Key	ID	Distance (ft)	Direction
No records found			

#### USGS National Water Information System

Map Key	Monitoring Loc Identifier	Distance (ft)	Direction
1	USGS-374900107390001	0.00	-
9	USGS-375244107335900	253.65	NE
13	USGS-374945107381004	398.55	W
13	USGS-374945107381005	398.55	W
17	USGS-375246107335500	534.32	NE
21	USGS-374852107390806	979.65	SW
21	USGS-374852107390801	979.65	SW
21	USGS-374852107390802	979.65	SW
21	USGS-374852107390803	979.65	SW
21	USGS-374852107390804	979.65	SW
21	USGS-374852107390805	979.65	SW
22	USGS-375143107340401	995.81	ENE
25	USGS-375144107340700	1131.24	ENE
26	USGS-375300107352201	1199.26	NNE
27	USGS-375436107381701	1392.22	N
29	USGS-375036107375601	1481.02	N
30	USGS-375114107375201	1503.39	N
35	USGS-375348107384101	1746.51	N
37	USGS-374914107392301	1811.54	WSW
39	USGS-375421107383701	2078.08	N
44	USGS-375344107384801	2480.77	N
46	USGS-374850107393401	2656.21	WSW
51	USGS-374854107393900	2858.69	WSW
56	USGS-09358000	3111.21	SW
59	USGS-375055107381801	3410.13	NNW
60	USGS-09358550	3450.13	WSW
63	USGS-375333107385401	3527.00	NNW
64	USGS-374900107395001	3606.39	WSW
66	USGS-375330107385501	3819.65	NNW
67	USGS-375329107385401	3845.03	NNW
68	USGS-375117107341601	3956.75	ENE
72	USGS-374900107400008	4406.78	WSW
73	USGS-375322107385201	4426.80	NNW
73	USGS-375322107385202	4426.80	NNW
73	USGS-375322107385203	4426.80	NNW
74	USGS-374839107395300	4537.16	WSW
77	USGS-374843107395801	4693.17	WSW
77	USGS-374843107395802	4693.17	WSW
78	USGS-375551107383101	4757.67	N
80	USGS-375322107391101	5272.17	NNW



## Wells and Additional Sources Summary

### Wells from NWIS

Map Key	ID	Distance (ft)	Direction
	No records found		

### State Sources

#### Oil and Gas Pit Locations

Map Key	ID	Distance (ft)	Direction
	No records found		

#### Oil and Gas Wells

Map Key	ID	Distance (ft)	Direction
	No records found		

#### Public Water Wells

Map Key	ID	Distance (ft)	Direction
	No records found		

### Water Wells Permit Database

Map Key	ID Key	Distance (ft)	Direction
1	0358195 330477	0.00	-
1	10006168 296616	0.00	-
1	10006167 296616	0.00	-
1	10008344 296616	0.00	-
1	10008342 296616	0.00	-
1	0056964 296616	0.00	-
1	10006165 296616	0.00	-
1	3676038B 296616	0.00	-
1	3676038A 296616	0.00	-
1	10006160 296616	0.00	-
1	10006155 296616	0.00	-
1	10006156 296616	0.00	-
1	10008343 296616	0.00	-
1	3676038C 296616	0.00	-
1	10006154 296616	0.00	-
1	3676038D 296616	0.00	-
1	3676038E 296616	0.00	-
1	10006169 296616	0.00	-
1	3676038G 296616	0.00	-
1	3676038F 296616	0.00	-
1	10006170 296616	0.00	-
1	3676038H 296616	0.00	-
1	3676038I 296616	0.00	-
1	10006157 296616	0.00	-
1	10006153 296616	0.00	-
1	3676038J 296616	0.00	-
1	0056962 296616	0.00	-
1	10006126 296616	0.00	-
1	3676038K 296616	0.00	-
1	3676038L 296616	0.00	-

## Wells and Additional Sources Summary

1	3676038M 296616	0.00	-
1	3676038N 296616	0.00	-
1	3676038O 296616	0.00	-
2	10006166 296616	36.96	SW
3	0362522 296616	41.38	WSW
4	10006164 296616	68.38	SW
5	10006158 296616	84.10	SW
5	10006159 296616	84.10	SW
6	0056963 296616	140.83	NE
7	10006163 296616	157.45	WSW
8	3676038R 296616	203.74	ENE
10	10006162 296616	261.75	SW
11	10006147 296616	308.78	SW
12	10006161 296616	345.24	SW
14	0065093 147190	435.25	WSW
15	3676038P 296616	445.77	ENE
16	3676038Q 296616	463.33	ENE
18	10014092 421549	819.44	ENE
19	10003282 421549	838.22	NE
20	9702273 355057	841.95	ESE
23	9700425 59663	1053.83	NE
24	0031288 308703	1091.35	SW
28	0215401 55362	1478.50	SW
31	0031287 308703	1620.11	WSW
32	9703903 47036	1660.66	ESE
33	9124716 129041	1679.81	SW
33	9124717 129041	1679.81	SW
34	0451134 363415	1746.44	ENE
36	9701750 190182	1761.21	WSW
38	0539706 65459	1871.42	ENE
40	3634951 204358	2081.42	N
41	0528424 62847	2104.72	ENE
42	0056196D 78644	2182.06	ENE
43	0056010 298953	2248.30	ENE
43	10020432 459697	2248.30	ENE
43	10020432 459698	2248.30	ENE
45	10014694 448872	2550.03	WSW
45	10014693 448872	2550.03	WSW
47	0056196C 78644	2706.97	ENE
48	9701454 179694	2739.01	WSW
49	0056196A 78644	2829.33	ENE
50	0056009 298953	2842.19	NE
52	9701655 30603	2863.06	ENE
53	0056196B 78644	2937.45	ENE
54	3615082 235506	2958.93	ENE
55	0540814 57914	2987.50	S
57	0546567 188540	3393.28	SSW
58	0357659 330477	3399.17	ENE
61	0062682 455398	3458.30	SW
62	0056007 298953	3502.82	ENE
65	3668288 282474	3638.35	N
69	0056008 298953	4013.88	ENE
70	9701902 9358	4034.67	ENE
71	9124722 201875	4348.01	E
75	3646427 141007	4571.74	WSW
76	3646428 141007	4650.74	WSW
79	0543225 221325	4936.81	ENE

## Wells and Additional Sources Detail Report

### USGS National Water Information System

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	-	0.00	0.00	9,329.54	FED USGS

Organiz Identifier: USGS-CO Formation Type:  
Organiz Name: USGS Colorado Water Science Center Aquifer Name:  
Well Depth: Aquifer Type:  
Well Depth Unit: Country Code: US  
Well Hole Depth: Provider Name: NWIS  
W Hole Depth Unit: County: SAN JUAN  
Construction Date: Latitude: 37.81666328000000  
Source Map Scale: Longitude: -107.6506165000000  
Monitoring Loc Name: ANIMAS RIVER ABOVE SILVERTON AT BRIDGE  
Monitoring Loc Identifier: USGS-374900107390001  
Monitoring Loc Type: Stream  
Monitoring Loc Desc:  
HUC Eight Digit Code: 14080104  
Drainage Area:  
Drainage Area Unit:  
Contrib Drainage Area:  
Contrib Drainage Area Unit:  
Horizontal Accuracy: 5  
Horizontal Accuracy Unit: seconds  
Horizontal Collection Mthd: Interpolated from MAP.  
Mthd:  
Horiz Coord Refer System: NAD83  
Vertical Measure:  
Vertical Measure Unit:  
Vertical Accuracy:  
Vertical Accuracy Unit:  
Vertical Collection Mthd:  
Vert Coord Refer System:

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
9	NE	0.05	253.65	9,863.18	FED USGS

Organiz Identifier: USGS-CO Formation Type:  
Organiz Name: USGS Colorado Water Science Center Aquifer Name:  
Well Depth: Aquifer Type:  
Well Depth Unit: Country Code: US  
Well Hole Depth: Provider Name: NWIS  
W Hole Depth Unit: County: SAN JUAN

## Wells and Additional Sources Detail Report

Construction Date:	Latitude:	37.87888540000000
Source Map Scale:	Longitude:	-107.56700390000000
Monitoring Loc Name:	S F ANIMAS R AT MOUTH AT EUREKA, CO	
Monitoring Loc Identifier:	USGS-375244107335900	
Monitoring Loc Type:	Stream	
Monitoring Loc Desc:		
HUC Eight Digit Code:	14080104	
Drainage Area:		
Drainage Area Unit:		
Contrib Drainage Area:		
Contrib Drainage Area Unit:		
Horizontal Accuracy:	5	
Horizontal Accuracy Unit:	seconds	
Horizontal Collection Mthd:	Interpolated from MAP.	
Horiz Coord Refer System:	NAD83	
Vertical Measure:		
Vertical Measure Unit:		
Vertical Accuracy:		
Vertical Accuracy Unit:		
Vertical Collection Mthd:		
Vert Coord Refer System:		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
13	W	0.08	398.55	9,718.00	FED USGS

Organiz Identifier:	USGS-CO	Formation Type:	
Organiz Name:	USGS Colorado Water Science Center	Aquifer Name:	
Well Depth:		Aquifer Type:	
Well Depth Unit:		Country Code:	US
Well Hole Depth:		Provider Name:	NWIS
W Hole Depth Unit:		County:	SAN JUAN
Construction Date:		Latitude:	37.82916320000000
Source Map Scale:		Longitude:	-107.63672740000000
Monitoring Loc Name:	BOULDER GULCH NR SILVERTON ABOVE WATER WORKS		
Monitoring Loc Identifier:	USGS-374945107381004		
Monitoring Loc Type:	Stream		
Monitoring Loc Desc:			
HUC Eight Digit Code:	14080104		
Drainage Area:			
Drainage Area Unit:			
Contrib Drainage Area:			
Contrib Drainage Area Unit:			
Horizontal Accuracy:	5		
Horizontal Accuracy Unit:	seconds		

## Wells and Additional Sources Detail Report

Horizontal Collection Interpolated from MAP.  
 Mthd:  
 Horiz Coord Refer NAD83  
 System:  
 Vertical Measure:  
 Vertical Measure Unit:  
 Vertical Accuracy:  
 Vertical Accuracy Unit:  
 Vertical Collection Mthd:  
 Vert Coord Refer System:

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
13	W	0.08	398.55	9,718.00	FED USGS

Organiz Identifier: USGS-CO Formation Type:  
 Organiz Name: USGS Colorado Water Science Center Aquifer Name:  
 Well Depth: Aquifer Type:  
 Well Depth Unit: Country Code: US  
 Well Hole Depth: Provider Name: NWIS  
 W Hole Depth Unit: County: SAN JUAN  
 Construction Date: Latitude: 37.82916320000000  
 Source Map Scale: Longitude: -107.6367274000000  
 Monitoring Loc Name: BOULDER GULCH NEAR SILVERTON WATER WORKS  
 Monitoring Loc Identifier: USGS-374945107381005  
 Monitoring Loc Type: Stream  
 Monitoring Loc Desc:  
 HUC Eight Digit Code: 14080104  
 Drainage Area:  
 Drainage Area Unit:  
 Contrib Drainage Area:  
 Contrib Drainage Area Unit:  
 Horizontal Accuracy: 5  
 Horizontal Accuracy Unit: seconds  
 Horizontal Collection Interpolated from MAP.  
 Mthd:  
 Horiz Coord Refer NAD83  
 System:  
 Vertical Measure:  
 Vertical Measure Unit:  
 Vertical Accuracy:  
 Vertical Accuracy Unit:  
 Vertical Collection Mthd:  
 Vert Coord Refer System:

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
17	NE	0.10	534.32	9,854.44	FED USGS



## Wells and Additional Sources Detail Report

Organiz Identifier:	USGS-CO	Formation Type:	
Organiz Name:	USGS Colorado Water Science Center	Aquifer Name:	
Well Depth:		Aquifer Type:	
Well Depth Unit:		Country Code:	US
Well Hole Depth:		Provider Name:	NWIS
W Hole Depth Unit:		County:	SAN JUAN
Construction Date:		Latitude:	37.87944097000000
Source Map Scale:		Longitude:	-107.5658928000000
Monitoring Loc Name:	ANIMAS R AB S F AT EUREKA, CO		
Monitoring Loc Identifier:	USGS-375246107335500		
Monitoring Loc Type:	Stream		
Monitoring Loc Desc:			
HUC Eight Digit Code:	14080104		
Drainage Area:			
Drainage Area Unit:			
Contrib Drainage Area:			
Contrib Drainage Area Unit:			
Horizontal Accuracy:	5		
Horizontal Accuracy Unit:	seconds		
Horizontal Collection Mthd:	Interpolated from MAP.		
Horiz Coord Refer System:	NAD83		
Vertical Measure:			
Vertical Measure Unit:			
Vertical Accuracy:			
Vertical Accuracy Unit:			
Vertical Collection Mthd:			
Vert Coord Refer System:			

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
21	SW	0.19	979.65	9,313.81	FED USGS

Organiz Identifier:	USGS-CO	Formation Type:	
Organiz Name:	USGS Colorado Water Science Center	Aquifer Name:	
Well Depth:		Aquifer Type:	
Well Depth Unit:		Country Code:	US
Well Hole Depth:		Provider Name:	NWIS
W Hole Depth Unit:		County:	SAN JUAN
Construction Date:		Latitude:	37.81444107000000
Source Map Scale:	24000	Longitude:	-107.6528388000000
Monitoring Loc Name:	LWSE6		
Monitoring Loc Identifier:	USGS-374852107390806		
Monitoring Loc Type:	Well: Test hole not completed as a well		
Monitoring Loc Desc:			
HUC Eight Digit Code:	14080104		

## Wells and Additional Sources Detail Report

Drainage Area:  
 Drainage Area Unit:  
 Contrib Drainage Area:  
 Contrib Drainage Area Unit:  
 Horizontal Accuracy: 1  
 Horizontal Accuracy Unit: seconds  
 Horizontal Collection Mthd: Interpolated from MAP.  
 Horiz Coord Refer System: NAD83  
 Vertical Measure: 9360.00  
 Vertical Measure Unit: feet  
 Vertical Accuracy: 20  
 Vertical Accuracy Unit: feet  
 Vertical Collection Mthd: Interpolated from topographic map.  
 Vert Coord Refer System: NGVD29

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
21	SW	0.19	979.65	9,313.81	FED USGS

Organiz Identifier:	USGS-CO	Formation Type:	
Organiz Name:	USGS Colorado Water Science Center	Aquifer Name:	
Well Depth:		Aquifer Type:	
Well Depth Unit:		Country Code:	US
Well Hole Depth:		Provider Name:	NWIS
W Hole Depth Unit:		County:	SAN JUAN
Construction Date:		Latitude:	37.81444107000000
Source Map Scale:	24000	Longitude:	-107.6528388000000
Monitoring Loc Name:	LWSE1		
Monitoring Loc Identifier:	USGS-374852107390801		
Monitoring Loc Type:	Well: Test hole not completed as a well		
Monitoring Loc Desc:			
HUC Eight Digit Code:	14080104		
Drainage Area:			
Drainage Area Unit:			
Contrib Drainage Area:			
Contrib Drainage Area Unit:			
Horizontal Accuracy:	1		
Horizontal Accuracy Unit:	seconds		
Horizontal Collection Mthd:	Interpolated from MAP.		
Horiz Coord Refer System:	NAD83		
Vertical Measure:	9360		
Vertical Measure Unit:	feet		
Vertical Accuracy:	20		
Vertical Accuracy Unit:	feet		

## Wells and Additional Sources Detail Report

Vertical Collection Mthd: Interpolated from topographic map.  
Vert Coord Refer System: NGVD29

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
21	SW	0.19	979.65	9,313.81	FED USGS

Organiz Identifier:	USGS-CO	Formation Type:	
Organiz Name:	USGS Colorado Water Science Center	Aquifer Name:	
Well Depth:		Aquifer Type:	
Well Depth Unit:		Country Code:	US
Well Hole Depth:		Provider Name:	NWIS
W Hole Depth Unit:		County:	SAN JUAN
Construction Date:		Latitude:	37.81444107000000
Source Map Scale:	24000	Longitude:	-107.6528388000000
Monitoring Loc Name:	LWSE2		
Monitoring Loc Identifier:	USGS-374852107390802		
Monitoring Loc Type:	Well: Test hole not completed as a well		
Monitoring Loc Desc:			
HUC Eight Digit Code:	14080104		
Drainage Area:			
Drainage Area Unit:			
Contrib Drainage Area:			
Contrib Drainage Area Unit:			
Horizontal Accuracy:	1		
Horizontal Accuracy Unit:	seconds		
Horizontal Collection Mthd:	Interpolated from MAP.		
Horiz Coord Refer System:	NAD83		
Vertical Measure:	9360		
Vertical Measure Unit:	feet		
Vertical Accuracy:	20		
Vertical Accuracy Unit:	feet		
Vertical Collection Mthd:	Interpolated from topographic map.		
Vert Coord Refer System:	NGVD29		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
21	SW	0.19	979.65	9,313.81	FED USGS

Organiz Identifier:	USGS-CO	Formation Type:	
Organiz Name:	USGS Colorado Water Science Center	Aquifer Name:	
Well Depth:		Aquifer Type:	
Well Depth Unit:		Country Code:	US
Well Hole Depth:		Provider Name:	NWIS
W Hole Depth Unit:		County:	SAN JUAN

## Wells and Additional Sources Detail Report

Construction Date:		Latitude:	37.81444107000000
Source Map Scale:	24000	Longitude:	-107.6528388000000
Monitoring Loc Name:	LWSE3		
Monitoring Loc Identifier:	USGS-374852107390803		
Monitoring Loc Type:	Well: Test hole not completed as a well		
Monitoring Loc Desc:			
HUC Eight Digit Code:	14080104		
Drainage Area:			
Drainage Area Unit:			
Contrib Drainage Area:			
Contrib Drainage Area Unit:			
Horizontal Accuracy:	1		
Horizontal Accuracy Unit:	seconds		
Horizontal Collection Mthd:	Interpolated from MAP.		
Horiz Coord Refer System:	NAD83		
Vertical Measure:	9360		
Vertical Measure Unit:	feet		
Vertical Accuracy:	20		
Vertical Accuracy Unit:	feet		
Vertical Collection Mthd:	Interpolated from topographic map.		
Vert Coord Refer System:	NGVD29		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
21	SW	0.19	979.65	9,313.81	FED USGS

Organiz Identifier:	USGS-CO	Formation Type:	
Organiz Name:	USGS Colorado Water Science Center	Aquifer Name:	
Well Depth:		Aquifer Type:	
Well Depth Unit:		Country Code:	US
Well Hole Depth:		Provider Name:	NWIS
W Hole Depth Unit:		County:	SAN JUAN
Construction Date:		Latitude:	37.81444107000000
Source Map Scale:	24000	Longitude:	-107.6528388000000
Monitoring Loc Name:	LWSE4		
Monitoring Loc Identifier:	USGS-374852107390804		
Monitoring Loc Type:	Well: Test hole not completed as a well		
Monitoring Loc Desc:			
HUC Eight Digit Code:	14080104		
Drainage Area:			
Drainage Area Unit:			
Contrib Drainage Area:			
Contrib Drainage Area Unit:			
Horizontal Accuracy:	1		
Horizontal Accuracy Unit:	seconds		

## Wells and Additional Sources Detail Report

Horizontal Collection Mthd: Interpolated from MAP.  
 Horiz Coord Refer System: NAD83  
 Vertical Measure: 9360  
 Vertical Measure Unit: feet  
 Vertical Accuracy: 20  
 Vertical Accuracy Unit: feet  
 Vertical Collection Mthd: Interpolated from topographic map.  
 Vert Coord Refer System: NGVD29

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
21	SW	0.19	979.65	9,313.81	FED USGS

Organiz Identifier: USGS-CO Formation Type:  
 Organiz Name: USGS Colorado Water Science Center Aquifer Name:  
 Well Depth: Aquifer Type:  
 Well Depth Unit: Country Code: US  
 Well Hole Depth: Provider Name: NWIS  
 W Hole Depth Unit: County: SAN JUAN  
 Construction Date: Latitude: 37.81444107000000  
 Source Map Scale: 24000 Longitude: -107.6528388000000  
 Monitoring Loc Name: LWSE5  
 Monitoring Loc Identifier: USGS-374852107390805  
 Monitoring Loc Type: Well: Test hole not completed as a well  
 Monitoring Loc Desc:  
 HUC Eight Digit Code: 14080104  
 Drainage Area:  
 Drainage Area Unit:  
 Contrib Drainage Area:  
 Contrib Drainage Area Unit:  
 Horizontal Accuracy: 1  
 Horizontal Accuracy Unit: seconds  
 Horizontal Collection Mthd: Interpolated from MAP.  
 Horiz Coord Refer System: NAD83  
 Vertical Measure: 9360.00  
 Vertical Measure Unit: feet  
 Vertical Accuracy: 20  
 Vertical Accuracy Unit: feet  
 Vertical Collection Mthd: Interpolated from topographic map.  
 Vert Coord Refer System: NGVD29

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
22	ENE	0.19	995.81	9,843.71	FED USGS



## Wells and Additional Sources Detail Report

Organiz Identifier:	USGS-CO	Formation Type:	
Organiz Name:	USGS Colorado Water Science Center	Aquifer Name:	
Well Depth:		Aquifer Type:	
Well Depth Unit:		Country Code:	US
Well Hole Depth:		Provider Name:	NWIS
W Hole Depth Unit:		County:	SAN JUAN
Construction Date:		Latitude:	37.86249669000000
Source Map Scale:		Longitude:	-107.5683929000000
Monitoring Loc Name:	MINNIE GULCH CREEK (NR. HOWARDSVILLE CO)		
Monitoring Loc Identifier:	USGS-375143107340401		
Monitoring Loc Type:	Stream		
Monitoring Loc Desc:			
HUC Eight Digit Code:	14080104		
Drainage Area:			
Drainage Area Unit:			
Contrib Drainage Area:			
Contrib Drainage Area Unit:			
Horizontal Accuracy:	5		
Horizontal Accuracy Unit:	seconds		
Horizontal Collection Mthd:	Interpolated from MAP.		
Horiz Coord Refer System:	NAD83		
Vertical Measure:			
Vertical Measure Unit:			
Vertical Accuracy:			
Vertical Accuracy Unit:			
Vertical Collection Mthd:			
Vert Coord Refer System:			

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
25	ENE	0.21	1,131.24	9,828.44	FED USGS

Organiz Identifier:	USGS-CO	Formation Type:	
Organiz Name:	USGS Colorado Water Science Center	Aquifer Name:	
Well Depth:		Aquifer Type:	
Well Depth Unit:		Country Code:	US
Well Hole Depth:		Provider Name:	NWIS
W Hole Depth Unit:		County:	SAN JUAN
Construction Date:		Latitude:	37.86221890000000
Source Map Scale:		Longitude:	-107.5692262000000
Monitoring Loc Name:	MINNIE GULCH AT MOUTH AT MIDDLETON, CO		
Monitoring Loc Identifier:	USGS-375144107340700		
Monitoring Loc Type:	Stream		
Monitoring Loc Desc:			
HUC Eight Digit Code:	14080104		

## Wells and Additional Sources Detail Report

Drainage Area:  
 Drainage Area Unit:  
 Contrib Drainage Area:  
 Contrib Drainage Area Unit:  
 Horizontal Accuracy: 5  
 Horizontal Accuracy Unit: seconds  
 Horizontal Collection Mthd: Interpolated from MAP.  
 Horiz Coord Refer System: NAD83  
 Vertical Measure:  
 Vertical Measure Unit:  
 Vertical Accuracy:  
 Vertical Accuracy Unit:  
 Vertical Collection Mthd:  
 Vert Coord Refer System:

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
26	NNE	0.23	1,199.26	10,475.24	FED USGS

Organiz Identifier:	USGS-CO	Formation Type:	
Organiz Name:	USGS Colorado Water Science Center	Aquifer Name:	
Well Depth:		Aquifer Type:	
Well Depth Unit:		Country Code:	US
Well Hole Depth:		Provider Name:	NWIS
W Hole Depth Unit:		County:	SAN JUAN
Construction Date:		Latitude:	37.88332960000000
Source Map Scale:		Longitude:	-107.58978200000000
Monitoring Loc Name:	EUREKA GULCH		
Monitoring Loc Identifier:	USGS-375300107352201		
Monitoring Loc Type:	Stream		
Monitoring Loc Desc:			
HUC Eight Digit Code:	14080104		
Drainage Area:			
Drainage Area Unit:			
Contrib Drainage Area:			
Contrib Drainage Area Unit:			
Horizontal Accuracy:	5		
Horizontal Accuracy Unit:	seconds		
Horizontal Collection Mthd:	Interpolated from MAP.		
Horiz Coord Refer System:	NAD83		
Vertical Measure:			
Vertical Measure Unit:			
Vertical Accuracy:			
Vertical Accuracy Unit:			

## Wells and Additional Sources Detail Report

Vertical Collection Mthd:  
Vert Coord Refer System:

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
27	N	0.26	1,392.22	11,481.62	FED USGS

Organiz Identifier:	USGS-CO	Formation Type:	
Organiz Name:	USGS Colorado Water Science Center	Aquifer Name:	
Well Depth:		Aquifer Type:	
Well Depth Unit:		Country Code:	US
Well Hole Depth:		Provider Name:	NWIS
W Hole Depth Unit:		County:	SAN JUAN
Construction Date:		Latitude:	37.91000000000000
Source Map Scale:	24000	Longitude:	-107.63805560000000
Monitoring Loc Name:	MOGUL MINE ADIT DRAINAGE BELOW HURRICANE PASS, CO		
Monitoring Loc Identifier:	USGS-375436107381701		
Monitoring Loc Type:	Subsurface: Tunnel, shaft, or mine		
Monitoring Loc Desc:			
HUC Eight Digit Code:	14080104		
Drainage Area:			
Drainage Area Unit:			
Contrib Drainage Area:			
Contrib Drainage Area Unit:			
Horizontal Accuracy:	5		
Horizontal Accuracy Unit:	seconds		
Horizontal Collection Mthd:	Interpolated from Digital MAP.		
Horiz Coord Refer System:	NAD83		
Vertical Measure:	11468		
Vertical Measure Unit:	feet		
Vertical Accuracy:	1.6		
Vertical Accuracy Unit:	feet		
Vertical Collection Mthd:	Interpolated from Digital Elevation Model		
Vert Coord Refer System:	NAVD88		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
29	N	0.28	1,481.02	11,020.46	FED USGS

Organiz Identifier:	USGS-CO	Formation Type:	
Organiz Name:	USGS Colorado Water Science Center	Aquifer Name:	
Well Depth:		Aquifer Type:	
Well Depth Unit:		Country Code:	US
Well Hole Depth:		Provider Name:	NWIS
W Hole Depth Unit:		County:	SAN JUAN

## Wells and Additional Sources Detail Report

Construction Date:	Latitude:	37.84332976000000
Source Map Scale:	Longitude:	-107.6328383000000
Monitoring Loc Name:	BOULDER GULCH BELOW TRIB NR SILVERTON, CO	
Monitoring Loc Identifier:	USGS-375036107375601	
Monitoring Loc Type:	Stream	
Monitoring Loc Desc:		
HUC Eight Digit Code:	14080104	
Drainage Area:		
Drainage Area Unit:		
Contrib Drainage Area:		
Contrib Drainage Area Unit:		
Horizontal Accuracy:	5	
Horizontal Accuracy Unit:	seconds	
Horizontal Collection Mthd:	Interpolated from MAP.	
Horiz Coord Refer System:	NAD83	
Vertical Measure:		
Vertical Measure Unit:		
Vertical Accuracy:		
Vertical Accuracy Unit:		
Vertical Collection Mthd:		
Vert Coord Refer System:		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
30	N	0.28	1,503.39	11,888.04	FED USGS

Organiz Identifier:	USGS-CO	Formation Type:	
Organiz Name:	USGS Colorado Water Science Center	Aquifer Name:	
Well Depth:		Aquifer Type:	
Well Depth Unit:		Country Code:	US
Well Hole Depth:		Provider Name:	NWIS
W Hole Depth Unit:		County:	SAN JUAN
Construction Date:		Latitude:	37.85388519000000
Source Map Scale:		Longitude:	-107.6317272000000
Monitoring Loc Name:	BOULDER GULCH ABOVE SILVERTON, CO		
Monitoring Loc Identifier:	USGS-375114107375201		
Monitoring Loc Type:	Stream		
Monitoring Loc Desc:			
HUC Eight Digit Code:	14080104		
Drainage Area:			
Drainage Area Unit:			
Contrib Drainage Area:			
Contrib Drainage Area Unit:			
Horizontal Accuracy:	5		
Horizontal Accuracy Unit:	seconds		

## Wells and Additional Sources Detail Report

Horizontal Collection Interpolated from MAP.  
 Mthd:  
 Horiz Coord Refer NAD83  
 System:  
 Vertical Measure:  
 Vertical Measure Unit:  
 Vertical Accuracy:  
 Vertical Accuracy Unit:  
 Vertical Collection Mthd:  
 Vert Coord Refer System:

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
35	N	0.33	1,746.51	10,844.09	FED USGS

Organiz Identifier:	USGS-CO	Formation Type:	
Organiz Name:	USGS Colorado Water Science Center	Aquifer Name:	
Well Depth:		Aquifer Type:	
Well Depth Unit:		Country Code:	US
Well Hole Depth:		Provider Name:	NWIS
W Hole Depth Unit:		County:	SAN JUAN
Construction Date:		Latitude:	37.89666667000000
Source Map Scale:	24000	Longitude:	-107.6447222000000
Monitoring Loc Name:	RED AND BONITA MINE OUTFALL ABOVE IRON FEN, CO		
Monitoring Loc Identifier:	USGS-375348107384101		
Monitoring Loc Type:	Facility: Outfall		
Monitoring Loc Desc:			
HUC Eight Digit Code:	14080104		
Drainage Area:			
Drainage Area Unit:			
Contrib Drainage Area:			
Contrib Drainage Area Unit:			
Horizontal Accuracy:	5		
Horizontal Accuracy Unit:	seconds		
Horizontal Collection Mthd:	Interpolated from Digital MAP.		
Horiz Coord Refer System:	NAD83		
Vertical Measure:	10841		
Vertical Measure Unit:	feet		
Vertical Accuracy:	1.6		
Vertical Accuracy Unit:	feet		
Vertical Collection Mthd:	Interpolated from Digital Elevation Model		
Vert Coord Refer System:	NAVD88		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
37	WSW	0.34	1,811.54	9,649.12	FED USGS



## Wells and Additional Sources Detail Report

Organiz Identifier:	USGS-CO	Formation Type:	
Organiz Name:	USGS Colorado Water Science Center	Aquifer Name:	
Well Depth:		Aquifer Type:	
Well Depth Unit:		Country Code:	US
Well Hole Depth:		Provider Name:	NWIS
W Hole Depth Unit:		County:	SAN JUAN
Construction Date:		Latitude:	37.82055208000000
Source Map Scale:		Longitude:	-107.6570055000000
Monitoring Loc Name:	NB04100717 BOULDER CRK		
Monitoring Loc Identifier:	USGS-374914107392301		
Monitoring Loc Type:	Stream		
Monitoring Loc Desc:			
HUC Eight Digit Code:	14080104		
Drainage Area:			
Drainage Area Unit:			
Contrib Drainage Area:			
Contrib Drainage Area Unit:			
Horizontal Accuracy:	5		
Horizontal Accuracy Unit:	seconds		
Horizontal Collection Mthd:	Interpolated from MAP.		
Horiz Coord Refer System:	NAD83		
Vertical Measure:			
Vertical Measure Unit:			
Vertical Accuracy:			
Vertical Accuracy Unit:			
Vertical Collection Mthd:			
Vert Coord Refer System:			

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
39	N	0.39	2,078.08	11,067.07	FED USGS

Organiz Identifier:	USGS-CO	Formation Type:	
Organiz Name:	USGS Colorado Water Science Center	Aquifer Name:	
Well Depth:		Aquifer Type:	
Well Depth Unit:		Country Code:	US
Well Hole Depth:		Provider Name:	NWIS
W Hole Depth Unit:		County:	SAN JUAN
Construction Date:		Latitude:	37.90583330000000
Source Map Scale:	24000	Longitude:	-107.6436111000000
Monitoring Loc Name:	SS250 - SPRING DISCHARGE ABOVE CEMENT CREEK, CO		
Monitoring Loc Identifier:	USGS-375421107383701		
Monitoring Loc Type:	Spring		
Monitoring Loc Desc:			
HUC Eight Digit Code:	14080104		

## Wells and Additional Sources Detail Report

Drainage Area:  
 Drainage Area Unit:  
 Contrib Drainage Area:  
 Contrib Drainage Area Unit:  
 Horizontal Accuracy: 5  
 Horizontal Accuracy Unit: seconds  
 Horizontal Collection Mthd: Interpolated from Digital MAP.  
 Horiz Coord Refer System: NAD83  
 Vertical Measure: 11066  
 Vertical Measure Unit: feet  
 Vertical Accuracy: 1.6  
 Vertical Accuracy Unit: feet  
 Vertical Collection Mthd: Interpolated from Digital Elevation Model  
 Vert Coord Refer System: NAVD88

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
44	N	0.47	2,480.77	10,724.21	FED USGS

Organiz Identifier: USGS-CO      Formation Type:  
 Organiz Name: USGS Colorado Water Science Center      Aquifer Name:  
 Well Depth:      Aquifer Type:  
 Well Depth Unit:      Country Code: US  
 Well Hole Depth:      Provider Name: NWIS  
 W Hole Depth Unit:      County: SAN JUAN  
 Construction Date:      Latitude: 37.89565556000000  
 Source Map Scale: 24000      Longitude: -107.64693890000000  
 Monitoring Loc Name: CEMENT CR ABV N FORK CEMENT CR NR SILVERTON, CO  
 Monitoring Loc Identifier: USGS-375344107384801  
 Monitoring Loc Type: Stream  
 Monitoring Loc Desc:  
 HUC Eight Digit Code: 14080104  
 Drainage Area:  
 Drainage Area Unit:  
 Contrib Drainage Area:  
 Contrib Drainage Area Unit:  
 Horizontal Accuracy: 1  
 Horizontal Accuracy Unit: minutes  
 Horizontal Collection Mthd: Interpolated from Digital MAP.  
 Horiz Coord Refer System: NAD83  
 Vertical Measure: 10724  
 Vertical Measure Unit: feet  
 Vertical Accuracy: 4.3  
 Vertical Accuracy Unit: feet

## Wells and Additional Sources Detail Report

Vertical Collection Mthd: Interpolated from Digital Elevation Model  
 Vert Coord Refer System: NAVD88

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
46	WSW	0.50	2,656.21	9,321.64	FED USGS

Organiz Identifier:	USGS-CO	Formation Type:	Alluvium, Flood Plain
Organiz Name:	USGS Colorado Water Science Center	Aquifer Name:	
Well Depth:	97.0	Aquifer Type:	Unconfined single aquifer
Well Depth Unit:	ft	Country Code:	US
Well Hole Depth:		Provider Name:	NWIS
W Hole Depth Unit:		County:	SAN JUAN
Construction Date:	19650101	Latitude:	37.81388547000000
Source Map Scale:		Longitude:	-107.6600612000000
Monitoring Loc Name:	NB04100717AD		
Monitoring Loc Identifier:	USGS-374850107393401		
Monitoring Loc Type:	Well		
Monitoring Loc Desc:			
HUC Eight Digit Code:	14080104		
Drainage Area:			
Drainage Area Unit:			
Contrib Drainage Area:			
Contrib Drainage Area Unit:			
Horizontal Accuracy:	5		
Horizontal Accuracy Unit:	seconds		
Horizontal Collection Mthd:	Interpolated from MAP.		
Horiz Coord Refer System:	NAD83		
Vertical Measure:	9320.00		
Vertical Measure Unit:	feet		
Vertical Accuracy:	20		
Vertical Accuracy Unit:	feet		
Vertical Collection Mthd:	Interpolated from topographic map.		
Vert Coord Refer System:	NGVD29		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
51	WSW	0.54	2,858.69	9,327.81	FED USGS

Organiz Identifier:	USGS-CO	Formation Type:	
Organiz Name:	USGS Colorado Water Science Center	Aquifer Name:	
Well Depth:		Aquifer Type:	
Well Depth Unit:		Country Code:	US
Well Hole Depth:		Provider Name:	NWIS
W Hole Depth Unit:		County:	SAN JUAN

## Wells and Additional Sources Detail Report

Construction Date:	Latitude:	37.81499656000000
Source Map Scale:	Longitude:	-107.6614500000000
Monitoring Loc Name:	CEMENT C AT MOUTH AT SILVERTON, CO	
Monitoring Loc Identifier:	USGS-374854107393900	
Monitoring Loc Type:	Stream	
Monitoring Loc Desc:		
HUC Eight Digit Code:	14080104	
Drainage Area:		
Drainage Area Unit:		
Contrib Drainage Area:		
Contrib Drainage Area Unit:		
Horizontal Accuracy:	5	
Horizontal Accuracy Unit:	seconds	
Horizontal Collection Mthd:	Interpolated from MAP.	
Horiz Coord Refer System:	NAD83	
Vertical Measure:		
Vertical Measure Unit:		
Vertical Accuracy:		
Vertical Accuracy Unit:		
Vertical Collection Mthd:		
Vert Coord Refer System:		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
56	SW	0.59	3,111.21	9,307.84	FED USGS

Organiz Identifier:	USGS-CO	Formation Type:	
Organiz Name:	USGS Colorado Water Science Center	Aquifer Name:	
Well Depth:		Aquifer Type:	
Well Depth Unit:		Country Code:	US
Well Hole Depth:		Provider Name:	NWIS
W Hole Depth Unit:		County:	SAN JUAN
Construction Date:		Latitude:	37.81110770000000
Source Map Scale:		Longitude:	-107.6592278000000
Monitoring Loc Name:	ANIMAS RIVER AT SILVERTON, CO.		
Monitoring Loc Identifier:	USGS-09358000		
Monitoring Loc Type:	Stream		
Monitoring Loc Desc:			
HUC Eight Digit Code:	14080104		
Drainage Area:	70.6		
Drainage Area Unit:	sq mi		
Contrib Drainage Area:			
Contrib Drainage Area Unit:			
Horizontal Accuracy:	1		
Horizontal Accuracy Unit:	seconds		

## Wells and Additional Sources Detail Report

Horizontal Collection Interpolated from MAP.  
 Mthd:  
 Horiz Coord Refer NAD83  
 System:  
 Vertical Measure: 9290.00  
 Vertical Measure Unit: feet  
 Vertical Accuracy: 10  
 Vertical Accuracy Unit: feet  
 Vertical Collection Mthd: Interpolated from topographic map.  
 Vert Coord Refer System: NGVD29

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
59	NNW	0.65	3,410.13	11,842.61	FED USGS

Organiz Identifier: USGS-CO Formation Type:  
 Organiz Name: USGS Colorado Water Science Center Aquifer Name:  
 Well Depth: Aquifer Type:  
 Well Depth Unit: Country Code: US  
 Well Hole Depth: Provider Name: NWIS  
 W Hole Depth Unit: County: SAN JUAN  
 Construction Date: Latitude: 37.84860740000000  
 Source Map Scale: Longitude: -107.6389495000000  
 Monitoring Loc Name: BOULDER GULCH TRIB NEAR SILVERTON, CO  
 Monitoring Loc Identifier: USGS-375055107381801  
 Monitoring Loc Type: Stream  
 Monitoring Loc Desc:  
 HUC Eight Digit Code: 14080104  
 Drainage Area:  
 Drainage Area Unit:  
 Contrib Drainage Area:  
 Contrib Drainage Area Unit:  
 Horizontal Accuracy: 5  
 Horizontal Accuracy Unit: seconds  
 Horizontal Collection Interpolated from MAP.  
 Mthd:  
 Horiz Coord Refer NAD83  
 System:  
 Vertical Measure:  
 Vertical Measure Unit:  
 Vertical Accuracy:  
 Vertical Accuracy Unit:  
 Vertical Collection Mthd:  
 Vert Coord Refer System:

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
60	WSW	0.65	3,450.13	9,429.04	FED USGS



## Wells and Additional Sources Detail Report

Organiz Identifier:	USGS-CO	Formation Type:	
Organiz Name:	USGS Colorado Water Science Center	Aquifer Name:	
Well Depth:		Aquifer Type:	
Well Depth Unit:		Country Code:	US
Well Hole Depth:		Provider Name:	NWIS
W Hole Depth Unit:		County:	SAN JUAN
Construction Date:		Latitude:	37.81971870000000
Source Map Scale:	24000	Longitude:	-107.66367230000000
Monitoring Loc Name:	CEMENT CREEK AT SILVERTON, CO		
Monitoring Loc Identifier:	USGS-09358550		
Monitoring Loc Type:	Stream		
Monitoring Loc Desc:			
HUC Eight Digit Code:	14080104		
Drainage Area:	20.1		
Drainage Area Unit:	sq mi		
Contrib Drainage Area:			
Contrib Drainage Area Unit:			
Horizontal Accuracy:	5		
Horizontal Accuracy Unit:	seconds		
Horizontal Collection Mthd:	Interpolated from MAP.		
Horiz Coord Refer System:	NAD83		
Vertical Measure:	9380		
Vertical Measure Unit:	feet		
Vertical Accuracy:	15		
Vertical Accuracy Unit:	feet		
Vertical Collection Mthd:	Unknown.		
Vert Coord Refer System:	NGVD29		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
63	NNW	0.67	3,527.00	10,587.44	FED USGS

Organiz Identifier:	USGS-CO	Formation Type:	
Organiz Name:	USGS Colorado Water Science Center	Aquifer Name:	
Well Depth:		Aquifer Type:	
Well Depth Unit:		Country Code:	US
Well Hole Depth:		Provider Name:	NWIS
W Hole Depth Unit:		County:	SAN JUAN
Construction Date:		Latitude:	37.89257500000000
Source Map Scale:	24000	Longitude:	-107.64836110000000
Monitoring Loc Name:	CEMENT CR ABV AMER TUNNEL BLW N FORK CEMENT CR		
Monitoring Loc Identifier:	USGS-375333107385401		
Monitoring Loc Type:	Stream		
Monitoring Loc Desc:			
HUC Eight Digit Code:	14080104		

## Wells and Additional Sources Detail Report

Drainage Area:  
 Drainage Area Unit:  
 Contrib Drainage Area:  
 Contrib Drainage Area Unit:  
 Horizontal Accuracy: 1  
 Horizontal Accuracy Unit: minutes  
 Horizontal Collection Mthd: Interpolated from Digital MAP.  
 Horiz Coord Refer System: NAD83  
 Vertical Measure: 10584  
 Vertical Measure Unit: feet  
 Vertical Accuracy: 4.3  
 Vertical Accuracy Unit: feet  
 Vertical Collection Mthd: Interpolated from Digital Elevation Model  
 Vert Coord Refer System: NAVD88

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
64	WSW	0.68	3,606.39	9,433.59	FED USGS

Organiz Identifier:	USGS-CO	Formation Type:	
Organiz Name:	USGS Colorado Water Science Center	Aquifer Name:	
Well Depth:		Aquifer Type:	
Well Depth Unit:		Country Code:	US
Well Hole Depth:		Provider Name:	NWIS
W Hole Depth Unit:		County:	SAN JUAN
Construction Date:		Latitude:	37.81666318000000
Source Map Scale:		Longitude:	-107.6645057000000
Monitoring Loc Name:	ANIMAS RIVER ABOVE SILVERTON, CO AT BRIDGE		
Monitoring Loc Identifier:	USGS-374900107395001		
Monitoring Loc Type:	Stream		
Monitoring Loc Desc:			
HUC Eight Digit Code:	14080104		
Drainage Area:			
Drainage Area Unit:			
Contrib Drainage Area:			
Contrib Drainage Area Unit:			
Horizontal Accuracy:	5		
Horizontal Accuracy Unit:	seconds		
Horizontal Collection Mthd:	Interpolated from MAP.		
Horiz Coord Refer System:	NAD83		
Vertical Measure:			
Vertical Measure Unit:			
Vertical Accuracy:			
Vertical Accuracy Unit:			

## Wells and Additional Sources Detail Report

Vertical Collection Mthd:  
Vert Coord Refer System:

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
66	NNW	0.72	3,819.65	10,600.53	FED USGS

Organiz Identifier:	USGS-CO	Formation Type:	
Organiz Name:	USGS Colorado Water Science Center	Aquifer Name:	
Well Depth:		Aquifer Type:	
Well Depth Unit:		Country Code:	US
Well Hole Depth:		Provider Name:	NWIS
W Hole Depth Unit:		County:	SAN JUAN
Construction Date:		Latitude:	37.89166667000000
Source Map Scale:	24000	Longitude:	-107.6486111000000
Monitoring Loc Name:	GOLD KING MINE OUTFALL DISSIPATOR NR GLADSTONE, CO		
Monitoring Loc Identifier:	USGS-375330107385501		
Monitoring Loc Type:	Facility: Outfall		
Monitoring Loc Desc:			
HUC Eight Digit Code:	14080104		
Drainage Area:			
Drainage Area Unit:			
Contrib Drainage Area:			
Contrib Drainage Area Unit:			
Horizontal Accuracy:	5		
Horizontal Accuracy Unit:	seconds		
Horizontal Collection Mthd:	Interpolated from Digital MAP.		
Horiz Coord Refer System:	NAD83		
Vertical Measure:	10595		
Vertical Measure Unit:	feet		
Vertical Accuracy:	1.6		
Vertical Accuracy Unit:	feet		
Vertical Collection Mthd:	Interpolated from Digital Elevation Model		
Vert Coord Refer System:	NAVD88		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
67	NNW	0.73	3,845.03	10,648.76	FED USGS

Organiz Identifier:	USGS-CO	Formation Type:	
Organiz Name:	USGS Colorado Water Science Center	Aquifer Name:	
Well Depth:		Aquifer Type:	
Well Depth Unit:		Country Code:	US
Well Hole Depth:		Provider Name:	NWIS
W Hole Depth Unit:		County:	SAN JUAN

## Wells and Additional Sources Detail Report

Construction Date:		Latitude:	37.89138889000000
Source Map Scale:	24000	Longitude:	-107.6483333000000
Monitoring Loc Name:	AMERICAN TUNNEL MINE OUTFALL NEAR GLADSTONE, CO		
Monitoring Loc Identifier:	USGS-375329107385401		
Monitoring Loc Type:	Facility: Outfall		
Monitoring Loc Desc:			
HUC Eight Digit Code:	14080104		
Drainage Area:			
Drainage Area Unit:			
Contrib Drainage Area:			
Contrib Drainage Area Unit:			
Horizontal Accuracy:	5		
Horizontal Accuracy Unit:	seconds		
Horizontal Collection Mthd:	Interpolated from Digital MAP.		
Horiz Coord Refer System:	NAD83		
Vertical Measure:	10649		
Vertical Measure Unit:	feet		
Vertical Accuracy:	1.6		
Vertical Accuracy Unit:	feet		
Vertical Collection Mthd:	Interpolated from Digital Elevation Model		
Vert Coord Refer System:	NAVD88		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
68	ENE	0.75	3,956.75	9,817.14	FED USGS

Organiz Identifier:	USGS-CO	Formation Type:	
Organiz Name:	USGS Colorado Water Science Center	Aquifer Name:	
Well Depth:		Aquifer Type:	
Well Depth Unit:		Country Code:	US
Well Hole Depth:		Provider Name:	NWIS
W Hole Depth Unit:		County:	SAN JUAN
Construction Date:		Latitude:	37.85471898000000
Source Map Scale:		Longitude:	-107.5717263000000
Monitoring Loc Name:	MAGGIE GULCH CREEK (NR HOWARDSVILLE CO)		
Monitoring Loc Identifier:	USGS-375117107341601		
Monitoring Loc Type:	Stream		
Monitoring Loc Desc:			
HUC Eight Digit Code:	14080104		
Drainage Area:			
Drainage Area Unit:			
Contrib Drainage Area:			
Contrib Drainage Area Unit:			
Horizontal Accuracy:	5		
Horizontal Accuracy Unit:	seconds		

## Wells and Additional Sources Detail Report

Horizontal Collection Interpolated from MAP.  
 Mthd:  
 Horiz Coord Refer NAD83  
 System:  
 Vertical Measure:  
 Vertical Measure Unit:  
 Vertical Accuracy:  
 Vertical Accuracy Unit:  
 Vertical Collection Mthd:  
 Vert Coord Refer System:

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
72	WSW	0.83	4,406.78	9,655.33	FED USGS

Organiz Identifier:	USGS-CO	Formation Type:	
Organiz Name:	USGS Colorado Water Science Center	Aquifer Name:	
Well Depth:		Aquifer Type:	
Well Depth Unit:		Country Code:	US
Well Hole Depth:		Provider Name:	NWIS
W Hole Depth Unit:		County:	SAN JUAN
Construction Date:		Latitude:	37.8166632
Source Map Scale:		Longitude:	-107.6672835
Monitoring Loc Name:	SILVERTON, WEATHER STATION (USWS)		
Monitoring Loc Identifier:	USGS-374900107400008		
Monitoring Loc Type:	Atmosphere		
Monitoring Loc Desc:			
HUC Eight Digit Code:			
Drainage Area:			
Drainage Area Unit:			
Contrib Drainage Area:			
Contrib Drainage Area Unit:			
Horizontal Accuracy:	5		
Horizontal Accuracy Unit:	seconds		
Horizontal Collection Mthd:	Interpolated from map		
Horiz Coord Refer System:	NAD83		
Vertical Measure:			
Vertical Measure Unit:			
Vertical Accuracy:			
Vertical Accuracy Unit:			
Vertical Collection Mthd:			
Vert Coord Refer System:			

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
73	NNW	0.84	4,426.80	10,603.28	FED USGS



## Wells and Additional Sources Detail Report

Organiz Identifier:	USGS-CO	Formation Type:	
Organiz Name:	USGS Colorado Water Science Center	Aquifer Name:	
Well Depth:		Aquifer Type:	
Well Depth Unit:		Country Code:	US
Well Hole Depth:		Provider Name:	NWIS
W Hole Depth Unit:		County:	SAN JUAN
Construction Date:		Latitude:	37.88944018000000
Source Map Scale:	24000	Longitude:	-107.64839380000000
Monitoring Loc Name:	NATURAL FLOW INTO MINE DUP3		
Monitoring Loc Identifier:	USGS-375322107385201		
Monitoring Loc Type:	Subsurface: Tunnel, shaft, or mine		
Monitoring Loc Desc:			
HUC Eight Digit Code:	14080104		
Drainage Area:			
Drainage Area Unit:			
Contrib Drainage Area:			
Contrib Drainage Area Unit:			
Horizontal Accuracy:	1		
Horizontal Accuracy Unit:	seconds		
Horizontal Collection Mthd:	Interpolated from MAP.		
Horiz Coord Refer System:	NAD83		
Vertical Measure:	10600.00		
Vertical Measure Unit:	feet		
Vertical Accuracy:	20		
Vertical Accuracy Unit:	feet		
Vertical Collection Mthd:	Interpolated from topographic map.		
Vert Coord Refer System:	NGVD29		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
73	NNW	0.84	4,426.80	10,603.28	FED USGS

Organiz Identifier:	USGS-CO	Formation Type:	
Organiz Name:	USGS Colorado Water Science Center	Aquifer Name:	
Well Depth:		Aquifer Type:	
Well Depth Unit:		Country Code:	US
Well Hole Depth:		Provider Name:	NWIS
W Hole Depth Unit:		County:	SAN JUAN
Construction Date:		Latitude:	37.88944018000000
Source Map Scale:	24000	Longitude:	-107.64839380000000
Monitoring Loc Name:	FLOW IN MINE		
Monitoring Loc Identifier:	USGS-375322107385202		
Monitoring Loc Type:	Subsurface: Tunnel, shaft, or mine		
Monitoring Loc Desc:			
HUC Eight Digit Code:	14080104		

## Wells and Additional Sources Detail Report

Drainage Area:  
 Drainage Area Unit:  
 Contrib Drainage Area:  
 Contrib Drainage Area Unit:  
 Horizontal Accuracy: 1  
 Horizontal Accuracy Unit: seconds  
 Horizontal Collection Mthd: Interpolated from MAP.  
 Horiz Coord Refer System: NAD83  
 Vertical Measure: 10600.00  
 Vertical Measure Unit: feet  
 Vertical Accuracy: 20  
 Vertical Accuracy Unit: feet  
 Vertical Collection Mthd: Interpolated from topographic map.  
 Vert Coord Refer System: NGVD29

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
73	NNW	0.84	4,426.80	10,603.28	FED USGS

Organiz Identifier:	USGS-CO	Formation Type:	
Organiz Name:	USGS Colorado Water Science Center	Aquifer Name:	
Well Depth:		Aquifer Type:	
Well Depth Unit:		Country Code:	US
Well Hole Depth:		Provider Name:	NWIS
W Hole Depth Unit:		County:	SAN JUAN
Construction Date:		Latitude:	37.88944018000000
Source Map Scale:	24000	Longitude:	-107.6483938000000
Monitoring Loc Name:	MINE DISCHARGE AT PORTAL, SITE 2		
Monitoring Loc Identifier:	USGS-375322107385203		
Monitoring Loc Type:	Subsurface: Tunnel, shaft, or mine		
Monitoring Loc Desc:			
HUC Eight Digit Code:	14080104		
Drainage Area:			
Drainage Area Unit:			
Contrib Drainage Area:			
Contrib Drainage Area Unit:			
Horizontal Accuracy:	1		
Horizontal Accuracy Unit:	seconds		
Horizontal Collection Mthd:	Interpolated from MAP.		
Horiz Coord Refer System:	NAD83		
Vertical Measure:	10600.00		
Vertical Measure Unit:	feet		
Vertical Accuracy:	20		
Vertical Accuracy Unit:	feet		

## Wells and Additional Sources Detail Report

Vertical Collection Mthd: Interpolated from topographic map.  
Vert Coord Refer System: NGVD29

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
74	WSW	0.86	4,537.16	9,298.50	FED USGS

Organiz Identifier:	USGS-CO	Formation Type:	
Organiz Name:	USGS Colorado Water Science Center	Aquifer Name:	
Well Depth:		Aquifer Type:	
Well Depth Unit:		Country Code:	US
Well Hole Depth:		Provider Name:	NWIS
W Hole Depth Unit:		County:	SAN JUAN
Construction Date:		Latitude:	37.81082990000000
Source Map Scale:		Longitude:	-107.66533900000000
Monitoring Loc Name:	AIR MOISTURE AT SILVERTON		
Monitoring Loc Identifier:	USGS-374839107395300		
Monitoring Loc Type:	Atmosphere		
Monitoring Loc Desc:			
HUC Eight Digit Code:	14080104		
Drainage Area:			
Drainage Area Unit:			
Contrib Drainage Area:			
Contrib Drainage Area Unit:			
Horizontal Accuracy:	5		
Horizontal Accuracy Unit:	seconds		
Horizontal Collection Mthd:	Interpolated from MAP.		
Horiz Coord Refer System:	NAD83		
Vertical Measure:			
Vertical Measure Unit:			
Vertical Accuracy:			
Vertical Accuracy Unit:			
Vertical Collection Mthd:			
Vert Coord Refer System:			

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
77	WSW	0.89	4,693.17	9,318.75	FED USGS

Organiz Identifier:	USGS-CO	Formation Type:	
Organiz Name:	USGS Colorado Water Science Center	Aquifer Name:	
Well Depth:		Aquifer Type:	
Well Depth Unit:		Country Code:	US
Well Hole Depth:		Provider Name:	NWIS
W Hole Depth Unit:		County:	SAN JUAN

## Wells and Additional Sources Detail Report

Construction Date:		Latitude:	37.81194100000000
Source Map Scale:	24000	Longitude:	-107.66672790000000
Monitoring Loc Name:	EQUIPMENT BLANK		
Monitoring Loc Identifier:	USGS-374843107395801		
Monitoring Loc Type:	Facility: Laboratory or sample-preparation area		
Monitoring Loc Desc:			
HUC Eight Digit Code:	14080104		
Drainage Area:			
Drainage Area Unit:			
Contrib Drainage Area:			
Contrib Drainage Area Unit:			
Horizontal Accuracy:	1		
Horizontal Accuracy Unit:	seconds		
Horizontal Collection Mthd:	Interpolated from MAP.		
Horiz Coord Refer System:	NAD83		
Vertical Measure:	9318.00		
Vertical Measure Unit:	feet		
Vertical Accuracy:	20		
Vertical Accuracy Unit:	feet		
Vertical Collection Mthd:	Interpolated from topographic map.		
Vert Coord Refer System:	NGVD29		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
77	WSW	0.89	4,693.17	9,318.75	FED USGS

Organiz Identifier:	USGS-CO	Formation Type:	
Organiz Name:	USGS Colorado Water Science Center	Aquifer Name:	
Well Depth:		Aquifer Type:	
Well Depth Unit:		Country Code:	US
Well Hole Depth:		Provider Name:	NWIS
W Hole Depth Unit:		County:	SAN JUAN
Construction Date:		Latitude:	37.81194100000000
Source Map Scale:	24000	Longitude:	-107.66672790000000
Monitoring Loc Name:	TRIP BLANK		
Monitoring Loc Identifier:	USGS-374843107395802		
Monitoring Loc Type:	Facility: Laboratory or sample-preparation area		
Monitoring Loc Desc:			
HUC Eight Digit Code:	14080104		
Drainage Area:			
Drainage Area Unit:			
Contrib Drainage Area:			
Contrib Drainage Area Unit:			
Horizontal Accuracy:	1		
Horizontal Accuracy Unit:	seconds		

## Wells and Additional Sources Detail Report

Horizontal Collection Interpolated from MAP.  
 Mthd:  
 Horiz Coord Refer NAD83  
 System:  
 Vertical Measure: 9318.00  
 Vertical Measure Unit: feet  
 Vertical Accuracy: 20  
 Vertical Accuracy Unit: feet  
 Vertical Collection Mthd: Interpolated from topographic map.  
 Vert Coord Refer System: NGVD29

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
78	N	0.90	4,757.67	13,000.58	FED USGS

Organiz Identifier: USGS-CO Formation Type:  
 Organiz Name: USGS Colorado Water Science Center Aquifer Name:  
 Well Depth: Aquifer Type:  
 Well Depth Unit: Country Code: US  
 Well Hole Depth: Provider Name: NWIS  
 W Hole Depth Unit: County: SAN MIGUEL  
 Construction Date: Latitude: 37.93082860000000  
 Source Map Scale: Longitude: -107.6425602000000  
 Monitoring Loc Name: MUDDY CREEK NEAR VANADIUM, CO  
 Monitoring Loc Identifier: USGS-375551107383101  
 Monitoring Loc Type: Stream  
 Monitoring Loc Desc:  
 HUC Eight Digit Code: 14020006  
 Drainage Area:  
 Drainage Area Unit:  
 Contrib Drainage Area:  
 Contrib Drainage Area Unit:  
 Horizontal Accuracy: 5  
 Horizontal Accuracy Unit: seconds  
 Horizontal Collection Interpolated from MAP.  
 Mthd:  
 Horiz Coord Refer NAD83  
 System:  
 Vertical Measure:  
 Vertical Measure Unit:  
 Vertical Accuracy:  
 Vertical Accuracy Unit:  
 Vertical Collection Mthd:  
 Vert Coord Refer System:

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
80	NNW	1.00	5,272.17	10,456.30	FED USGS



## Wells and Additional Sources Detail Report

Organiz Identifier:	USGS-CO	Formation Type:	
Organiz Name:	USGS Colorado Water Science Center	Aquifer Name:	
Well Depth:		Aquifer Type:	
Well Depth Unit:		Country Code:	US
Well Hole Depth:		Provider Name:	NWIS
W Hole Depth Unit:		County:	SAN JUAN
Construction Date:		Latitude:	37.889700000000000
Source Map Scale:	24000	Longitude:	-107.65326940000000
Monitoring Loc Name:	CEMENT CR ABV S FORK CEMENT CR NR SILVERTON, CO		
Monitoring Loc Identifier:	USGS-375322107391101		
Monitoring Loc Type:	Stream		
Monitoring Loc Desc:			
HUC Eight Digit Code:	14080104		
Drainage Area:			
Drainage Area Unit:			
Contrib Drainage Area:			
Contrib Drainage Area Unit:			
Horizontal Accuracy:	1		
Horizontal Accuracy Unit:	minutes		
Horizontal Collection Mthd:	Interpolated from Digital MAP.		
Horiz Coord Refer System:	NAD83		
Vertical Measure:	10456		
Vertical Measure Unit:	feet		
Vertical Accuracy:	4.3		
Vertical Accuracy Unit:	feet		
Vertical Collection Mthd:	Interpolated from Digital Elevation Model		
Vert Coord Refer System:	NAVD88		

### Water Wells Permit Database

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	-	0.00	0.00	10,388.54	WATER WELLS

Receipt:	0358195	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	42803-F	City:	
Permit Issued:	09/28/1993	County:	SAN JUAN
Permit Expires:	09/28/1995	State:	
Permit Category:	General Purpose	Postal Code:	
Current Status:	Well Constructed	Township:	42.0 N
Special Use:		Range:	6.0 W
Associated Uses:	Commercial, Domestic	Section:	19
Permitted Area:		Q160:	NE
Permttd Area Unts:		Q40:	SW

## Wells and Additional Sources Detail Report

Annul Approp. (AF):	Q10:
Well Depth (Feet): 100	Coords E/W (Feet): 2300
Top Prf. Csng (ft): 75	Coords E/W Dir: E
Bot Prf. Csng (ft): 100	Coords N/S (Feet): 2300
Designated Basin:	Coords N/S Dir: N
Well Constructed: 08/19/1994	UTM x: 274167.9
Frst Bneficial Use:	UTM y: 4196077.2
Pump Installed:	Location: (37.884217, -107.567961)
Well Plugged:	Location Type: Well (Application/Permit)
Yield (GPM):	Location Accuracy: Spotted from section lines
Statc Wtr Lvl (ft): 12.00	Elevation: 9000
Denver Basn Aqufr: No	Latitude: 37.884217
Statc Watr Lvl Dt: 1994/08/19	Longitude: -107.567961
Modified: 03/15/1995 12:00:00 AM	Mangemnt District:
Associated Aqufrs: ALL UNNAMED AQUIFERS	Division: 7
Water District: 30	Principle Meridian: N
Contact Name: PADRICK, KEVIN D	ID Key: 0358195 330477
Counties:	
Well Name:	
Comment:	
Address:	
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/0358195">https://dwr.state.co.us/Tools/WellPermits/0358195</a>

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	-	0.00	0.00	9,336.51	WATER WELLS

Receipt: 10006168	Parcel Name:
WD ID:	Prcl Sze (Acres):
Associated Case No:	Lot:
County Parcel ID:	Block:
Permit: 318802-	City:
Permit Issued: 09/21/2020	County: SAN JUAN
Permit Expires: 09/21/2022	State:
Permit Category: Monitoring/Observation	Postal Code:
Current Status: Permit Issued	Township: 41.0 N
Special Use:	Range: 7.0 W
Associated Uses: Monitoring/Sampling	Section: 17
Permitted Area:	Q160: NE
Permtted Area Unts:	Q40: NE
Annul Approp. (AF):	Q10:
Well Depth (Feet):	Coords E/W (Feet):
Top Prf. Csng (ft):	Coords E/W Dir:
Bot Prf. Csng (ft):	Coords N/S (Feet):
Designated Basin:	Coords N/S Dir:
Well Constructed:	UTM x: 266592.0
Frst Bneficial Use:	UTM y: 4188863.0

## Wells and Additional Sources Detail Report

Pump Installed:		Location:	(37.817356, -107.651696)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	User supplied
Staic Wtr Lvl (ft):		Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.817356
Staic Wtr Lvl Dt:		Longitude:	-107.651696
Modified:	09/21/2020 10:58:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	SUNNYSIDE GOLD CORPORATION	ID Key:	10006168 296616
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/10006168">https://dwr.state.co.us/Tools/WellPermits/10006168</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	-	0.00	0.00	9,329.44	WATER WELLS

Receipt:	10006167	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	318801-	City:	
Permit Issued:	09/21/2020	County:	SAN JUAN
Permit Expires:	09/21/2022	State:	
Permit Category:	Monitoring/Observation	Postal Code:	
Current Status:	Permit Issued	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Monitoring/Sampling	Section:	16
Permitted Area:		Q160:	NW
Permtted Area Unts:		Q40:	NW
Annul Approp. (AF):		Q10:	
Well Depth (Feet):		Coords E/W (Feet):	
Top Prf. Csng (ft):		Coords E/W Dir:	
Bot Prf. Csng (ft):		Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:		UTM x:	266642.0
Frst Bneficial Use:		UTM y:	4188806.0
Pump Installed:		Location:	(37.816856, -107.65111)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	User supplied
Staic Wtr Lvl (ft):		Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.816856
Staic Wtr Lvl Dt:		Longitude:	-107.651110
Modified:	09/21/2020 10:53:00 AM	Mangemnt District:	

## Wells and Additional Sources Detail Report

Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	SUNNYSIDE GOLD CORPORATION	ID Key:	10006167 296616
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/10006167">https://dwr.state.co.us/Tools/WellPermits/10006167</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	-	0.00	0.00	9,329.35	WATER WELLS

Receipt:	10008344	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	321419-	City:	
Permit Issued:	04/19/2021	County:	SAN JUAN
Permit Expires:		State:	
Permit Category:	Monitoring/Observation	Postal Code:	
Current Status:	Well Constructed	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Monitoring/Sampling	Section:	16
Permitted Area:		Q160:	NW
Permtted Area Unts:		Q40:	NW
Annul Approp. (AF):		Q10:	
Well Depth (Feet):	20	Coords E/W (Feet):	
Top Prf. Csng (ft):		Coords E/W Dir:	
Bot Prf. Csng (ft):		Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:	10/17/2020	UTM x:	266677.0
Frst Bneficial Use:		UTM y:	4188777.0
Pump Installed:		Location:	(37.816604, -107.650703)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	User supplied
Statc Wtr Lvl (ft):		Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.816604
Statc Wtr Lvl Dt:		Longitude:	-107.650703
Modified:	04/19/2021 04:32:00 PM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	SUNNYSIDE GOLD CORPORATION	ID Key:	10008344 296616
Counties:			
Well Name:			
Comment:			
Address:			

## Wells and Additional Sources Detail Report

More Information: <https://dwr.state.co.us/Tools/WellPermits/10008344>

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	-	0.00	0.00	9,338.83	WATER WELLS

Receipt:	10008342	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	321417-	City:	
Permit Issued:	04/19/2021	County:	SAN JUAN
Permit Expires:		State:	
Permit Category:	Monitoring/Observation	Postal Code:	
Current Status:	Well Constructed	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Monitoring/Sampling	Section:	16
Permitted Area:		Q160:	NW
Permitted Area Unts:		Q40:	NW
Annul Approp. (AF):		Q10:	
Well Depth (Feet):	85	Coords E/W (Feet):	
Top Prf. Csng (ft):	70	Coords E/W Dir:	
Bot Prf. Csng (ft):	75	Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:	10/16/2020	UTM x:	266685.0
Frst Bneficial Use:		UTM y:	4188873.0
Pump Installed:		Location:	(37.81747, -107.650644)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	User supplied
Statc Wtr Lvl (ft):	0.00	Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.817470
Statc Wtr Lvl Dt:	2020/10/22	Longitude:	-107.650644
Modified:	04/19/2021 04:00:00 PM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	SUNNYSIDE GOLD CORPORATION	ID Key:	10008342 296616

Counties:

Well Name:

Comment:

Address:

More Information: <https://dwr.state.co.us/Tools/WellPermits/10008342>

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	-	0.00	0.00	9,332.60	WATER WELLS

Receipt:	0056964	Parcel Name:	
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## Wells and Additional Sources Detail Report

WD ID: Associated Case No: County Parcel ID: Permit: 56964-MH Permit Issued: 07/17/2017 Permit Expires: 10/15/2017 Permit Category: Monitoring Hole (Notice of Intent) Current Status: Well Constructed Special Use: Associated Uses: Monitoring/Sampling Permitted Area: Permitted Area Units: Annual Approp. (AF): Well Depth (Feet): 18 Top Prf. Casing (ft): Bot Prf. Casing (ft): Designated Basin: Well Constructed: 09/08/2017 First Beneficial Use: Pump Installed: Well Plugged: Yield (GPM): Static Wtr Lvl (ft): 5.80 Denver Basin Aquifer: No Static Wtr Lvl Date: 2017/09/08 Modified: 05/24/2022 08:45:00 AM Associated Aquifers: ALL UNNAMED AQUIFERS Water District: 30 Contact Name: SUNNYSIDE GOLD CORPORATION Counties: Well Name: Comment: Address: More Information: <a href="https://dwr.state.co.us/Tools/WellPermits/0056964">https://dwr.state.co.us/Tools/WellPermits/0056964</a>	Prcl Size (Acres): Lot: Block: City: County: SAN JUAN State: Postal Code: Township: 41.0 N Range: 7.0 W Section: 16 Q160: NW Q40: NW Q10: Coords E/W (Feet): Coords E/W Dir: Coords N/S (Feet): Coords N/S Dir: UTM x: 266703.1 UTM y: 4188818.5 Location: (37.81698, -107.650422) Location Type: Well (Construction Report) Location Accuracy: User supplied Elevation: Latitude: 37.816980 Longitude: -107.650422 Management District: Division: 7 Principle Meridian: N ID Key: 0056964 296616
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Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	-	0.00	0.00	9,342.23	WATER WELLS

Receipt: 10006165 WD ID: Associated Case No: County Parcel ID: Permit: 318797- Permit Issued: 09/21/2020 Permit Expires: 09/21/2022 Permit Category: Monitoring/Observation	Parcel Name: Prcl Size (Acres): Lot: Block: City: County: SAN JUAN State: Postal Code:
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## Wells and Additional Sources Detail Report

Current Status:	Permit Issued	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Monitoring/Sampling	Section:	16
Permitted Area:		Q160:	NW
Permitted Area Unts:		Q40:	NW
Annul Approp. (AF):		Q10:	
Well Depth (Feet):		Coords E/W (Feet):	
Top Prf. Csng (ft):		Coords E/W Dir:	
Bot Prf. Csng (ft):		Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:		UTM x:	266761.0
Frst Bneficial Use:		UTM y:	4188894.0
Pump Installed:		Location:	(37.817679, -107.649788)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	User supplied
Statc Wtr Lvl (ft):		Elevation:	
Denver Basn Aquifr:	No	Latitude:	37.817679
Statc Watr Lvl Dt:		Longitude:	-107.649788
Modified:	09/21/2020 10:43:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	SUNNYSIDE GOLD CORPORATION	ID Key:	10006165 296616
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/10006165">https://dwr.state.co.us/Tools/WellPermits/10006165</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	-	0.00	0.00	9,383.94	WATER WELLS

Receipt:	3676038B	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	302528-	City:	
Permit Issued:	08/26/2016	County:	SAN JUAN
Permit Expires:		State:	
Permit Category:	Monitoring/Observation	Postal Code:	
Current Status:	Well Constructed	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Monitoring/Sampling	Section:	9
Permitted Area:		Q160:	SW
Permitted Area Unts:		Q40:	SE
Annul Approp. (AF):		Q10:	
Well Depth (Feet):	57	Coords E/W (Feet):	

## Wells and Additional Sources Detail Report

Top Prf. Csng (ft):	47	Coords E/W Dir:	
Bot Prf. Csng (ft):	57	Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:	08/07/2015	UTM x:	267021.0
Frst Bneficial Use:		UTM y:	4189128.0
Pump Installed:		Location:	(37.819852, -107.646912)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	User supplied
Statc Wtr Lvl (ft):	56.00	Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.819852
Statc Watr Lvl Dt:	2015/08/07	Longitude:	-107.646912
Modified:	08/19/2016 12:00:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	SUNNYSIDE GOLD CORPORATION	ID Key:	3676038B 296616
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/3676038B">https://dwr.state.co.us/Tools/WellPermits/3676038B</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	-	0.00	0.00	9,441.60	WATER WELLS

Receipt:	3676038A	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	302527-	City:	
Permit Issued:	08/26/2016	County:	SAN JUAN
Permit Expires:		State:	
Permit Category:	Monitoring/Observation	Postal Code:	
Current Status:	Well Constructed	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Monitoring/Sampling	Section:	9
Permitted Area:		Q160:	SW
Permtted Area Unts:		Q40:	SE
Annul Approp. (AF):		Q10:	
Well Depth (Feet):	41	Coords E/W (Feet):	
Top Prf. Csng (ft):	29	Coords E/W Dir:	
Bot Prf. Csng (ft):	39	Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:	08/07/2015	UTM x:	267018.0
Frst Bneficial Use:		UTM y:	4189198.0
Pump Installed:		Location:	(37.820481, -107.646969)
Well Plugged:		Location Type:	Well (Application/Permit)

## Wells and Additional Sources Detail Report

Yield (GPM):		Location Accuracy:	User supplied
Statc Wtr Lvl (ft):	28.00	Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.820481
Statc Wtr Lvl Dt:	2015/08/07	Longitude:	-107.646969
Modified:	08/19/2016 12:00:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	SUNNYSIDE GOLD CORPORATION	ID Key:	3676038A 296616
Counties:			
Well Name:			
Comment:			
Address:			
More Information:		<a href="https://dwr.state.co.us/Tools/WellPermits/3676038A">https://dwr.state.co.us/Tools/WellPermits/3676038A</a>	

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	-	0.00	0.00	9,355.70	WATER WELLS

Receipt:	10006160	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	318792-	City:	
Permit Issued:	09/21/2020	County:	SAN JUAN
Permit Expires:	09/21/2022	State:	
Permit Category:	Monitoring/Observation	Postal Code:	
Current Status:	Permit Issued	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Monitoring/Sampling	Section:	9
Permitted Area:		Q160:	SW
Permtted Area Unts:		Q40:	SE
Annul Approp. (AF):		Q10:	
Well Depth (Feet):		Coords E/W (Feet):	
Top Prf. Csng (ft):		Coords E/W Dir:	
Bot Prf. Csng (ft):		Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:		UTM x:	267084.0
Frst Bneficial Use:		UTM y:	4188992.0
Pump Installed:		Location:	(37.818643, -107.646153)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	User supplied
Statc Wtr Lvl (ft):		Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.818643
Statc Wtr Lvl Dt:		Longitude:	-107.646153
Modified:	09/21/2020 10:03:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N

## Wells and Additional Sources Detail Report

Contact Name:	SUNNYSIDE GOLD CORPORATION	ID Key:	10006160 296616
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/10006160">https://dwr.state.co.us/Tools/WellPermits/10006160</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	-	0.00	0.00	9,377.14	WATER WELLS

Receipt:	10006155	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	318784-	City:	
Permit Issued:	09/21/2020	County:	SAN JUAN
Permit Expires:	09/21/2022	State:	
Permit Category:	Monitoring/Observation	Postal Code:	
Current Status:	Permit Issued	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Monitoring/Sampling	Section:	9
Permitted Area:		Q160:	SW
Permitted Area Unts:		Q40:	SE
Annul Approp. (AF):		Q10:	
Well Depth (Feet):		Coords E/W (Feet):	
Top Prf. Csng (ft):		Coords E/W Dir:	
Bot Prf. Csng (ft):		Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:		UTM x:	267102.0
Frst Bneficial Use:		UTM y:	4189118.0
Pump Installed:		Location:	(37.819782, -107.64599)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	User supplied
Statc Wtr Lvl (ft):		Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.819782
Statc Watr Lvl Dt:		Longitude:	-107.645990
Modified:	09/21/2020 09:08:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	SUNNYSIDE GOLD CORPORATION	ID Key:	10006155 296616
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/10006155">https://dwr.state.co.us/Tools/WellPermits/10006155</a>		



## Wells and Additional Sources Detail Report

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	-	0.00	0.00	9,377.14	WATER WELLS

Receipt:	10006156	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	318786-	City:	
Permit Issued:	09/21/2020	County:	SAN JUAN
Permit Expires:	09/21/2022	State:	
Permit Category:	Monitoring/Observation	Postal Code:	
Current Status:	Permit Issued	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Monitoring/Sampling	Section:	9
Permitted Area:		Q160:	SW
Permtted Area Unts:		Q40:	SE
Annul Approp. (AF):		Q10:	
Well Depth (Feet):		Coords E/W (Feet):	
Top Prf. Csng (ft):		Coords E/W Dir:	
Bot Prf. Csng (ft):		Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:		UTM x:	267102.0
Frst Bneficial Use:		UTM y:	4189118.0
Pump Installed:		Location:	(37.819782, -107.64599)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	User supplied
Statc Wtr Lvl (ft):		Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.819782
Statc Watr Lvl Dt:		Longitude:	-107.645990
Modified:	09/21/2020 09:13:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	SUNNYSIDE GOLD CORPORATION	ID Key:	10006156 296616
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/10006156">https://dwr.state.co.us/Tools/WellPermits/10006156</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	-	0.00	0.00	9,455.10	WATER WELLS

Receipt:	10008343	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	

## Wells and Additional Sources Detail Report

County Parcel ID:	Block:	
Permit: 321418-	City:	
Permit Issued: 04/19/2021	County:	SAN JUAN
Permit Expires:	State:	
Permit Category: Monitoring/Observation	Postal Code:	
Current Status: Well Constructed	Township:	41.0 N
Special Use:	Range:	7.0 W
Associated Uses: Monitoring/Sampling	Section:	9
Permitted Area:	Q160:	SW
Permitted Area Units:	Q40:	SE
Annul Approp. (AF):	Q10:	
Well Depth (Feet): 171	Coords E/W (Feet):	
Top Prf. Csng (ft):	Coords E/W Dir:	
Bot Prf. Csng (ft):	Coords N/S (Feet):	
Designated Basin:	Coords N/S Dir:	
Well Constructed: 10/22/2020	UTM x:	267108.0
Frst Bneficial Use:	UTM y:	4189299.0
Pump Installed:	Location:	(37.821414, -107.64598)
Well Plugged:	Location Type:	Well (Application/Permit)
Yield (GPM):	Location Accuracy:	User supplied
Statc Wtr Lvl (ft):	Elevation:	
Denver Basn Aqufr: No	Latitude:	37.821414
Statc Wtr Lvl Dt:	Longitude:	-107.645980
Modified: 04/19/2021 04:15:00 PM	Mangemnt District:	
Associated Aqufrs: ALL UNNAMED AQUIFERS	Division:	7
Water District: 30	Principle Meridian:	N
Contact Name: SUNNYSIDE GOLD CORPORATION	ID Key:	10008343 296616
Counties:		
Well Name:		
Comment:		
Address:		
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/10008343">https://dwr.state.co.us/Tools/WellPermits/10008343</a>	

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	-	0.00	0.00	9,370.21	WATER WELLS

Receipt: 3676038C	Parcel Name:	
WD ID:	Prcl Sze (Acres):	
Associated Case No:	Lot:	
County Parcel ID:	Block:	
Permit: 302529-	City:	
Permit Issued: 08/26/2016	County:	SAN JUAN
Permit Expires:	State:	
Permit Category: Monitoring/Observation	Postal Code:	
Current Status: Well Constructed	Township:	41.0 N
Special Use:	Range:	7.0 W

## Wells and Additional Sources Detail Report

Associated Uses:	Monitoring/Sampling	Section:	9
Permitted Area:		Q160:	SW
Permitted Area Units:		Q40:	SE
Annul Approp. (AF):		Q10:	
Well Depth (Feet):	97	Coords E/W (Feet):	
Top Prf. Csng (ft):	92	Coords E/W Dir:	
Bot Prf. Csng (ft):	97	Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:	08/08/2015	UTM x:	267195.0
First Beneficial Use:		UTM y:	4189117.0
Pump Installed:		Location:	(37.819797, -107.644934)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	User supplied
Static Water Level (ft):	82.00	Elevation:	
Denver Basin Aquifer:	No	Latitude:	37.819797
Static Water Level Date:	2015/08/08	Longitude:	-107.644934
Modified:	08/19/2016 12:00:00 AM	Management District:	
Associated Aquifers:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	SUNNYSIDE GOLD CORPORATION	ID Key:	3676038C 296616
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/3676038C">https://dwr.state.co.us/Tools/WellPermits/3676038C</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	-	0.00	0.00	9,371.58	WATER WELLS

Receipt:	10006154	Parcel Name:	
WD ID:		Parcel Size (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	318781-	City:	
Permit Issued:	09/21/2020	County:	SAN JUAN
Permit Expires:	09/21/2022	State:	
Permit Category:	Monitoring/Observation	Postal Code:	
Current Status:	Permit Issued	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Monitoring/Sampling	Section:	9
Permitted Area:		Q160:	SW
Permitted Area Units:		Q40:	SE
Annul Approp. (AF):		Q10:	
Well Depth (Feet):		Coords E/W (Feet):	
Top Prf. Csng (ft):		Coords E/W Dir:	
Bot Prf. Csng (ft):		Coords N/S (Feet):	

## Wells and Additional Sources Detail Report

Designated Basin:	Coords N/S Dir:
Well Constructed:	UTM x: 267198.0
Frst Bneficial Use:	UTM y: 4189118.0
Pump Installed:	Location: (37.819807, -107.6449)
Well Plugged:	Location Type: Well (Application/Permit)
Yield (GPM):	Location Accuracy: User supplied
Statc Wtr Lvl (ft):	Elevation:
Denver Basn Aqufr: No	Latitude: 37.819807
Statc Watr Lvl Dt:	Longitude: -107.644900
Modified: 09/21/2020 09:02:00 AM	Mangemnt District:
Associated Aqufrs: ALL UNNAMED AQUIFERS	Division: 7
Water District: 30	Principle Meridian: N
Contact Name: SUNNYSIDE GOLD CORPORATION	ID Key: 10006154 296616
Counties:	
Well Name:	
Comment:	
Address:	
More Information: <a href="https://dwr.state.co.us/Tools/WellPermits/10006154">https://dwr.state.co.us/Tools/WellPermits/10006154</a>	

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	-	0.00	0.00	9,438.44	WATER WELLS

Receipt: 3676038D	Parcel Name:
WD ID:	Prcl Sze (Acres):
Associated Case No:	Lot:
County Parcel ID:	Block:
Permit: 302530-	City:
Permit Issued: 08/26/2016	County: SAN JUAN
Permit Expires:	State:
Permit Category: Monitoring/Observation	Postal Code:
Current Status: Well Constructed	Township: 41.0 N
Special Use:	Range: 7.0 W
Associated Uses: Monitoring/Sampling	Section: 9
Permitted Area:	Q160: SW
Permtted Area Unts:	Q40: SE
Annul Approp. (AF):	Q10:
Well Depth (Feet): 60	Coords E/W (Feet):
Top Prf. Csng (ft): 50	Coords E/W Dir:
Bot Prf. Csng (ft): 60	Coords N/S (Feet):
Designated Basin:	Coords N/S Dir:
Well Constructed: 08/07/2015	UTM x: 267173.0
Frst Bneficial Use:	UTM y: 4189312.0
Pump Installed:	Location: (37.821547, -107.645246)
Well Plugged:	Location Type: Well (Application/Permit)
Yield (GPM):	Location Accuracy: User supplied
Statc Wtr Lvl (ft): 80.00	Elevation:

## Wells and Additional Sources Detail Report

Denver Basn Aqufr:	No	Latitude:	37.821547
Statc Watr Lvl Dt:	2015/08/07	Longitude:	-107.645246
Modified:	08/19/2016 12:00:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	SUNNYSIDE GOLD CORPORATION	ID Key:	3676038D 296616
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/3676038D">https://dwr.state.co.us/Tools/WellPermits/3676038D</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	-	0.00	0.00	9,398.58	WATER WELLS

Receipt:	3676038E	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	302531-	City:	
Permit Issued:	08/26/2016	County:	SAN JUAN
Permit Expires:		State:	
Permit Category:	Monitoring/Observation	Postal Code:	
Current Status:	Well Constructed	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Monitoring/Sampling	Section:	9
Permitted Area:		Q160:	SW
Permtted Area Unts:		Q40:	SE
Annul Approp. (AF):		Q10:	
Well Depth (Feet):	89	Coords E/W (Feet):	
Top Prf. Csng (ft):	79	Coords E/W Dir:	
Bot Prf. Csng (ft):	89	Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:	09/12/2015	UTM x:	267202.0
Frst Bneficial Use:		UTM y:	4189203.0
Pump Installed:		Location:	(37.820573, -107.644882)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	User supplied
Statc Wtr Lvl (ft):	69.00	Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.820573
Statc Watr Lvl Dt:	2015/09/12	Longitude:	-107.644882
Modified:	08/19/2016 12:00:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	SUNNYSIDE GOLD CORPORATION	ID Key:	3676038E 296616
Counties:			



## Wells and Additional Sources Detail Report

Well Name:

Comment:

Address:

More Information: <https://dwr.state.co.us/Tools/WellPermits/3676038E>

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	-	0.00	0.00	9,396.75	WATER WELLS

Receipt: 10006169 WD ID: Associated Case No: County Parcel ID: Permit: 318803- Permit Issued: 09/21/2020 Permit Expires: 09/21/2022 Permit Category: Monitoring/Observation Current Status: Permit Issued Special Use: Associated Uses: Monitoring/Sampling Permitted Area: Permitted Area Units: Annual Approp. (AF): Well Depth (Feet): Top Prf. Csng (ft): Bot Prf. Csng (ft): Designated Basin: Well Constructed: First Beneficial Use: Pump Installed: Well Plugged: Yield (GPM): Static Wtr Lvl (ft): Denver Basin Aquifer: No Static Wtr Lvl Dt: Modified: 09/21/2020 11:04:00 AM Associated Aquifers: ALL UNNAMED AQUIFERS Water District: 30 Contact Name: SUNNYSIDE GOLD CORPORATION	Parcel Name: Parcel Size (Acres): Lot: Block: City: County: SAN JUAN State: Postal Code: Township: 41.0 N Range: 7.0 W Section: 9 Q160: SW Q40: SE Q10: Coords E/W (Feet): Coords E/W Dir: Coords N/S (Feet): Coords N/S Dir: UTM x: 267204.0 UTM y: 4189197.0 Location: (37.82052, -107.644857) Location Type: Well (Application/Permit) Location Accuracy: User supplied Elevation: Latitude: 37.820520 Longitude: -107.644857 Management District: Division: 7 Principle Meridian: N ID Key: 10006169 296616
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Counties:

Well Name:

Comment:

Address:

More Information: <https://dwr.state.co.us/Tools/WellPermits/10006169>

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	-	0.00	0.00	9,402.18	WATER WELLS

## Wells and Additional Sources Detail Report

Receipt:	3676038G	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	302533-	City:	
Permit Issued:	08/26/2016	County:	SAN JUAN
Permit Expires:		State:	
Permit Category:	Monitoring/Observation	Postal Code:	
Current Status:	Well Constructed	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Monitoring/Sampling	Section:	9
Permitted Area:		Q160:	SW
Permitted Area Unts:		Q40:	SE
Annul Approp. (AF):		Q10:	
Well Depth (Feet):	110	Coords E/W (Feet):	
Top Prf. Csng (ft):	100	Coords E/W Dir:	
Bot Prf. Csng (ft):	110	Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:	09/16/2015	UTM x:	267230.0
Frst Bneficial Use:		UTM y:	4189252.0
Pump Installed:		Location:	(37.821022, -107.64458)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	User supplied
Statc Wtr Lvl (ft):	70.00	Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.821022
Statc Watr Lvl Dt:	2015/09/16	Longitude:	-107.644580
Modified:	08/19/2016 12:00:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	SUNNYSIDE GOLD CORPORATION	ID Key:	3676038G 296616
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/3676038G">https://dwr.state.co.us/Tools/WellPermits/3676038G</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	-	0.00	0.00	9,401.09	WATER WELLS

Receipt:	3676038F	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	302532-	City:	

## Wells and Additional Sources Detail Report

Permit Issued:	08/26/2016	County:	SAN JUAN
Permit Expires:		State:	
Permit Category:	Monitoring/Observation	Postal Code:	
Current Status:	Well Constructed	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Monitoring/Sampling	Section:	9
Permitted Area:		Q160:	SW
Permitted Area Unts:		Q40:	SE
Annul Approp. (AF):		Q10:	
Well Depth (Feet):	77	Coords E/W (Feet):	
Top Prf. Csng (ft):	67	Coords E/W Dir:	
Bot Prf. Csng (ft):	77	Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:	08/13/2015	UTM x:	267244.0
Frst Bneficial Use:		UTM y:	4189262.0
Pump Installed:		Location:	(37.821115, -107.644424)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	User supplied
Statc Wtr Lvl (ft):	71.00	Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.821115
Statc Wtr Lvl Dt:	2015/08/13	Longitude:	-107.644424
Modified:	08/19/2016 12:00:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	SUNNYSIDE GOLD CORPORATION	ID Key:	3676038F 296616
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/3676038F">https://dwr.state.co.us/Tools/WellPermits/3676038F</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	-	0.00	0.00	9,382.78	WATER WELLS

Receipt:	10006170	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	318804-	City:	
Permit Issued:	09/21/2020	County:	SAN JUAN
Permit Expires:	09/21/2022	State:	
Permit Category:	Monitoring/Observation	Postal Code:	
Current Status:	Permit Issued	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Monitoring/Sampling	Section:	9
Permitted Area:		Q160:	SW

## Wells and Additional Sources Detail Report

Permitted Area Units:	Q40:	SE
Annul Approp. (AF):	Q10:	
Well Depth (Feet):	Coords E/W (Feet):	
Top Prf. Csng (ft):	Coords E/W Dir:	
Bot Prf. Csng (ft):	Coords N/S (Feet):	
Designated Basin:	Coords N/S Dir:	
Well Constructed:	UTM x:	267305.0
Frst Bneficial Use:	UTM y:	4189208.0
Pump Installed:	Location:	(37.820645, -107.643714)
Well Plugged:	Location Type:	Well (Application/Permit)
Yield (GPM):	Location Accuracy:	User supplied
Statc Wtr Lvl (ft):	Elevation:	
Denver Basn Aqufr: No	Latitude:	37.820645
Statc Watr Lvl Dt:	Longitude:	-107.643714
Modified: 09/21/2020 11:10:00 AM	Mangemnt District:	
Associated Aqufrs: ALL UNNAMED AQUIFERS	Division:	7
Water District: 30	Principle Meridian:	N
Contact Name: SUNNYSIDE GOLD CORPORATION	ID Key:	10006170 296616
Counties:		
Well Name:		
Comment:		
Address:		
More Information: <a href="https://dwr.state.co.us/Tools/WellPermits/10006170">https://dwr.state.co.us/Tools/WellPermits/10006170</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	-	0.00	0.00	9,383.33	WATER WELLS

Receipt: 3676038H	Parcel Name:
WD ID:	Prcl Sze (Acres):
Associated Case No:	Lot:
County Parcel ID:	Block:
Permit: 302534-	City:
Permit Issued: 08/26/2016	County: SAN JUAN
Permit Expires:	State:
Permit Category: Monitoring/Observation	Postal Code:
Current Status: Well Constructed	Township: 41.0 N
Special Use:	Range: 7.0 W
Associated Uses: Monitoring/Sampling	Section: 9
Permitted Area:	Q160: SW
Permtted Area Units:	Q40: SE
Annul Approp. (AF):	Q10:
Well Depth (Feet): 96	Coords E/W (Feet):
Top Prf. Csng (ft): 86	Coords E/W Dir:
Bot Prf. Csng (ft): 96	Coords N/S (Feet):
Designated Basin:	Coords N/S Dir:
Well Constructed: 08/10/2015	UTM x: 267308.0

## Wells and Additional Sources Detail Report

First Beneficial Use:	UTM y:	4189211.0
Pump Installed:	Location:	(37.820672, -107.643681)
Well Plugged:	Location Type:	Well (Application/Permit)
Yield (GPM):	Location Accuracy:	User supplied
Static Water Level (ft): 76.00	Elevation:	
Denver Basin Aquifer: No	Latitude:	37.820672
Static Water Level Date: 2015/08/10	Longitude:	-107.643681
Modified: 08/19/2016 12:00:00 AM	Management District:	
Associated Aquifers: ALL UNNAMED AQUIFERS	Division:	7
Water District: 30	Principle Meridian:	N
Contact Name: SUNNYSIDE GOLD CORPORATION	ID Key:	3676038H 296616
Counties:		
Well Name:		
Comment:		
Address:		
More Information: <a href="https://dwr.state.co.us/Tools/WellPermits/3676038H">https://dwr.state.co.us/Tools/WellPermits/3676038H</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	-	0.00	0.00	9,396.03	WATER WELLS

Receipt: 3676038I	Parcel Name:
WD ID:	Parcel Size (Acres):
Associated Case No:	Lot:
County Parcel ID:	Block:
Permit: 302535-	City:
Permit Issued: 08/26/2016	County: SAN JUAN
Permit Expires:	State:
Permit Category: Monitoring/Observation	Postal Code:
Current Status: Well Constructed	Township: 41.0 N
Special Use:	Range: 7.0 W
Associated Uses: Monitoring/Sampling	Section: 9
Permitted Area:	Q160: SW
Permitted Area Units:	Q40: SE
Annual Approp. (AF):	Q10:
Well Depth (Feet): 79	Coords E/W (Feet):
Top Profile Casing (ft): 69	Coords E/W Dir:
Bottom Profile Casing (ft): 79	Coords N/S (Feet):
Designated Basin:	Coords N/S Dir:
Well Constructed: 08/11/2015	UTM x: 267334.0
First Beneficial Use:	UTM y: 4189304.0
Pump Installed:	Location: (37.821516, -107.643416)
Well Plugged:	Location Type: Well (Application/Permit)
Yield (GPM):	Location Accuracy: User supplied
Static Water Level (ft): 63.00	Elevation:
Denver Basin Aquifer: No	Latitude: 37.821516
Static Water Level Date: 2015/08/11	Longitude: -107.643416



## Wells and Additional Sources Detail Report

Modified:	08/19/2016 12:00:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	SUNNYSIDE GOLD CORPORATION	ID Key:	3676038I 296616
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/3676038I">https://dwr.state.co.us/Tools/WellPermits/3676038I</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	-	0.00	0.00	9,374.83	WATER WELLS

Receipt:	10006157	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	318787-	City:	
Permit Issued:	09/21/2020	County:	SAN JUAN
Permit Expires:	09/21/2022	State:	
Permit Category:	Monitoring/Observation	Postal Code:	
Current Status:	Permit Issued	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Monitoring/Sampling	Section:	9
Permitted Area:		Q160:	SW
Permtted Area Unts:		Q40:	SE
Annul Approp. (AF):		Q10:	
Well Depth (Feet):		Coords E/W (Feet):	
Top Prf. Csng (ft):		Coords E/W Dir:	
Bot Prf. Csng (ft):		Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:		UTM x:	267393.0
Frst Bneficial Use:		UTM y:	4189189.0
Pump Installed:		Location:	(37.820496, -107.64271)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	User supplied
Statc Wtr Lvl (ft):		Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.820496
Statc Watr Lvl Dt:		Longitude:	-107.642710
Modified:	09/21/2020 09:19:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	SUNNYSIDE GOLD CORPORATION	ID Key:	10006157 296616
Counties:			
Well Name:			
Comment:			

## Wells and Additional Sources Detail Report

Address:

More Information: <https://dwr.state.co.us/Tools/WellPermits/10006157>

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	-	0.00	0.00	9,393.88	WATER WELLS

Receipt:	10006153	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	318780-	City:	
Permit Issued:	09/21/2020	County:	SAN JUAN
Permit Expires:	09/21/2022	State:	
Permit Category:	Monitoring/Observation	Postal Code:	
Current Status:	Permit Issued	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Monitoring/Sampling	Section:	9
Permitted Area:		Q160:	SW
Permitted Area Unts:		Q40:	NE
Annul Approp. (AF):		Q10:	
Well Depth (Feet):		Coords E/W (Feet):	
Top Prf. Csng (ft):		Coords E/W Dir:	
Bot Prf. Csng (ft):		Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:		UTM x:	267400.0
Frst Bneficial Use:		UTM y:	4189327.0
Pump Installed:		Location:	(37.82174, -107.642674)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	User supplied
Statc Wtr Lvl (ft):		Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.821740
Statc Watr Lvl Dt:		Longitude:	-107.642674
Modified:	09/21/2020 08:54:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	SUNNYSIDE GOLD CORPORATION	ID Key:	10006153 296616
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/10006153">https://dwr.state.co.us/Tools/WellPermits/10006153</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	-	0.00	0.00	9,453.33	WATER WELLS

## Wells and Additional Sources Detail Report

Receipt:	3676038J	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	302536-	City:	
Permit Issued:	08/26/2016	County:	SAN JUAN
Permit Expires:		State:	
Permit Category:	Monitoring/Observation	Postal Code:	
Current Status:	Well Constructed	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Monitoring/Sampling	Section:	9
Permitted Area:		Q160:	SE
Permttd Area Unts:		Q40:	NW
Annul Approp. (AF):		Q10:	
Well Depth (Feet):	52	Coords E/W (Feet):	
Top Prf. Csng (ft):	41	Coords E/W Dir:	
Bot Prf. Csng (ft):	51	Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:	08/28/2015	UTM x:	267773.0
Frst Bneficial Use:		UTM y:	4189551.0
Pump Installed:		Location:	(37.823852, -107.638513)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	User supplied
Statc Wtr Lvl (ft):		Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.823852
Statc Watr Lvl Dt:		Longitude:	-107.638513
Modified:	08/19/2016 12:00:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	SUNNYSIDE GOLD CORPORATION	ID Key:	3676038J 296616
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/3676038J">https://dwr.state.co.us/Tools/WellPermits/3676038J</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	-	0.00	0.00	9,443.07	WATER WELLS

Receipt:	0056962	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	56962-MH	City:	
Permit Issued:	07/17/2017	County:	SAN JUAN
Permit Expires:	10/15/2017	State:	

## Wells and Additional Sources Detail Report

Permit Category:	Monitoring Hole (Notice of Intent)	Postal Code:	
Current Status:	Well Constructed	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Monitoring/Sampling	Section:	9
Permitted Area:		Q160:	SE
Permitted Area Unts:		Q40:	NW
Annul Approp. (AF):		Q10:	
Well Depth (Feet):	23	Coords E/W (Feet):	
Top Prf. Csng (ft):		Coords E/W Dir:	
Bot Prf. Csng (ft):		Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:	08/13/2017	UTM x:	267781.8
Frst Bneficial Use:		UTM y:	4189531.3
Pump Installed:		Location:	(37.823674, -107.638404)
Well Plugged:		Location Type:	Well (Construction Report)
Yield (GPM):		Location Accuracy:	User supplied
Statc Wtr Lvl (ft):	7.50	Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.823674
Statc Wtr Lvl Dt:	2017/08/13	Longitude:	-107.638404
Modified:	05/16/2018 08:22:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	SUNNYSIDE GOLD CORPORATION	ID Key:	0056962 296616
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/0056962">https://dwr.state.co.us/Tools/WellPermits/0056962</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	-	0.00	0.00	9,442.96	WATER WELLS

Receipt:	10006126	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	318777-	City:	
Permit Issued:	09/21/2020	County:	SAN JUAN
Permit Expires:	09/21/2022	State:	
Permit Category:	Monitoring/Observation	Postal Code:	
Current Status:	Permit Issued	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Monitoring/Sampling	Section:	9
Permitted Area:		Q160:	SE
Permitted Area Unts:		Q40:	NE
Annul Approp. (AF):		Q10:	

## Wells and Additional Sources Detail Report

Well Depth (Feet):	Coords E/W (Feet):
Top Prf. Csng (ft):	Coords E/W Dir:
Bot Prf. Csng (ft):	Coords N/S (Feet):
Designated Basin:	Coords N/S Dir:
Well Constructed:	UTM x: 267846.0
Frst Bneficial Use:	UTM y: 4189550.0
Pump Installed:	Location: (37.823862, -107.637684)
Well Plugged:	Location Type: Well (Application/Permit)
Yield (GPM):	Location Accuracy: User supplied
Statc Wtr Lvl (ft):	Elevation:
Denver Basn Aqufr: No	Latitude: 37.823862
Statc Watr Lvl Dt:	Longitude: -107.637684
Modified: 09/21/2020 08:39:00 AM	Mangemnt District:
Associated Aqufrs: ALL UNNAMED AQUIFERS	Division: 7
Water District: 30	Principle Meridian: N
Contact Name: SUNNYSIDE GOLD CORPORATION	ID Key: 10006126 296616
Counties:	
Well Name:	
Comment:	
Address:	
More Information: <a href="https://dwr.state.co.us/Tools/WellPermits/10006126">https://dwr.state.co.us/Tools/WellPermits/10006126</a>	

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	-	0.00	0.00	9,615.85	WATER WELLS

Receipt: 3676038K	Parcel Name:
WD ID:	Prcl Sze (Acres):
Associated Case No:	Lot:
County Parcel ID:	Block:
Permit: 302537-	City:
Permit Issued: 08/26/2016	County: SAN JUAN
Permit Expires:	State:
Permit Category: Monitoring/Observation	Postal Code:
Current Status: Well Constructed	Township: 41.0 N
Special Use:	Range: 7.0 W
Associated Uses: Monitoring/Sampling	Section: 9
Permitted Area:	Q160: NE
Permtted Area Unts:	Q40: SE
Annul Approp. (AF):	Q10:
Well Depth (Feet): 125	Coords E/W (Feet):
Top Prf. Csng (ft): 120	Coords E/W Dir:
Bot Prf. Csng (ft): 125	Coords N/S (Feet):
Designated Basin:	Coords N/S Dir:
Well Constructed: 08/26/2015	UTM x: 267916.0
Frst Bneficial Use:	UTM y: 4189745.0
Pump Installed:	Location: (37.825635, -107.636952)



## Wells and Additional Sources Detail Report

Well Plugged:	Location Type:	Well (Application/Permit)
Yield (GPM):	Location Accuracy:	User supplied
Statc Wtr Lvl (ft): 119.00	Elevation:	
Denver Basn Aqufr: No	Latitude:	37.825635
Statc Wtr Lvl Dt: 2015/08/26	Longitude:	-107.636952
Modified: 08/19/2016 12:00:00 AM	Mangemnt District:	
Associated Aqufrs: ALL UNNAMED AQUIFERS	Division:	7
Water District: 30	Principle Meridian:	N
Contact Name: SUNNYSIDE GOLD CORPORATION	ID Key:	3676038K 296616
Counties:		
Well Name:		
Comment:		
Address:		
More Information: <a href="https://dwr.state.co.us/Tools/WellPermits/3676038K">https://dwr.state.co.us/Tools/WellPermits/3676038K</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	-	0.00	0.00	9,622.53	WATER WELLS

Receipt: 3676038L	Parcel Name:
WD ID:	PrcL Sze (Acres):
Associated Case No:	Lot:
County Parcel ID:	Block:
Permit: 302538-	City:
Permit Issued: 08/26/2016	County: SAN JUAN
Permit Expires:	State:
Permit Category: Monitoring/Observation	Postal Code:
Current Status: Well Constructed	Township: 41.0 N
Special Use:	Range: 7.0 W
Associated Uses: Monitoring/Sampling	Section: 9
Permitted Area:	Q160: NE
Permtted Area Unts:	Q40: SE
Annul Approp. (AF):	Q10:
Well Depth (Feet): 109	Coords E/W (Feet):
Top Prf. Csng (ft): 104	Coords E/W Dir:
Bot Prf. Csng (ft): 109	Coords N/S (Feet):
Designated Basin:	Coords N/S Dir:
Well Constructed: 08/27/2015	UTM x: 267970.0
Frst Bneficial Use:	UTM y: 4189811.0
Pump Installed:	Location: (37.826243, -107.63636)
Well Plugged:	Location Type: Well (Application/Permit)
Yield (GPM):	Location Accuracy: User supplied
Statc Wtr Lvl (ft):	Elevation:
Denver Basn Aqufr: No	Latitude: 37.826243
Statc Wtr Lvl Dt:	Longitude: -107.636360
Modified: 08/19/2016 12:00:00 AM	Mangemnt District:
Associated Aqufrs: ALL UNNAMED AQUIFERS	Division: 7

## Wells and Additional Sources Detail Report

Water District:	30	Principle Meridian:	N
Contact Name:	SUNNYSIDE GOLD CORPORATION	ID Key:	3676038L 296616
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/3676038L">https://dwr.state.co.us/Tools/WellPermits/3676038L</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	-	0.00	0.00	9,635.94	WATER WELLS

Receipt:	3676038M	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	302539-	City:	
Permit Issued:	08/26/2016	County:	SAN JUAN
Permit Expires:		State:	
Permit Category:	Monitoring/Observation	Postal Code:	
Current Status:	Well Constructed	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Monitoring/Sampling	Section:	9
Permitted Area:		Q160:	NE
Permitted Area Unts:		Q40:	SE
Annul Approp. (AF):		Q10:	
Well Depth (Feet):	92	Coords E/W (Feet):	
Top Prf. Csng (ft):	82	Coords E/W Dir:	
Bot Prf. Csng (ft):	92	Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:	08/21/2015	UTM x:	268171.0
Frst Bneficial Use:		UTM y:	4189987.0
Pump Installed:		Location:	(37.827879, -107.634135)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	User supplied
Statc Wtr Lvl (ft):	85.00	Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.827879
Statc Watr Lvl Dt:	2015/08/21	Longitude:	-107.634135
Modified:	08/19/2016 12:00:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	SUNNYSIDE GOLD CORPORATION	ID Key:	3676038M 296616
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/3676038M">https://dwr.state.co.us/Tools/WellPermits/3676038M</a>		

## Wells and Additional Sources Detail Report

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	-	0.00	0.00	9,648.28	WATER WELLS

Receipt:	3676038N	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	302540-	City:	
Permit Issued:	08/26/2016	County:	SAN JUAN
Permit Expires:		State:	
Permit Category:	Monitoring/Observation	Postal Code:	
Current Status:	Well Constructed	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Monitoring/Sampling	Section:	10
Permitted Area:		Q160:	NW
Permttd Area Unts:		Q40:	SW
Annul Approp. (AF):		Q10:	
Well Depth (Feet):	117	Coords E/W (Feet):	
Top Prf. Csng (ft):	107	Coords E/W Dir:	
Bot Prf. Csng (ft):	117	Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:	08/23/2015	UTM x:	268375.0
Frst Bneficial Use:		UTM y:	4189963.0
Pump Installed:		Location:	(37.827714, -107.631811)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	User supplied
Statc Wtr Lvl (ft):		Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.827714
Statc Watr Lvl Dt:		Longitude:	-107.631811
Modified:	08/19/2016 12:00:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	SUNNYSIDE GOLD CORPORATION	ID Key:	3676038N 296616
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/3676038N">https://dwr.state.co.us/Tools/WellPermits/3676038N</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
1	-	0.00	0.00	9,687.27	WATER WELLS

Receipt:	3676038O	Parcel Name:	
WD ID:		Prcl Sze (Acres):	

## Wells and Additional Sources Detail Report

Associated Case No:	Lot:
County Parcel ID:	Block:
Permit: 302541-	City:
Permit Issued: 08/26/2016	County: SAN JUAN
Permit Expires:	State:
Permit Category: Monitoring/Observation	Postal Code:
Current Status: Well Constructed	Township: 41.0 N
Special Use:	Range: 7.0 W
Associated Uses: Monitoring/Sampling	Section: 10
Permitted Area:	Q160: NW
Permitted Area Units:	Q40: SW
Annul Approp. (AF):	Q10:
Well Depth (Feet): 80	Coords E/W (Feet):
Top Prf. Csng (ft): 70	Coords E/W Dir:
Bot Prf. Csng (ft): 80	Coords N/S (Feet):
Designated Basin:	Coords N/S Dir:
Well Constructed: 08/24/2015	UTM x: 268554.0
Frst Bneficial Use:	UTM y: 4190062.0
Pump Installed:	Location: (37.828651, -107.629811)
Well Plugged:	Location Type: Well (Application/Permit)
Yield (GPM):	Location Accuracy: User supplied
Statc Wtr Lvl (ft): 70.00	Elevation:
Denver Basn Aqufr: No	Latitude: 37.828651
Statc Wtr Lvl Dt: 2015/08/24	Longitude: -107.629811
Modified: 08/19/2016 12:00:00 AM	Mangemnt District:
Associated Aqufrs: ALL UNNAMED AQUIFERS	Division: 7
Water District: 30	Principle Meridian: N
Contact Name: SUNNYSIDE GOLD CORPORATION	ID Key: 3676038O 296616
Counties:	
Well Name:	
Comment:	
Address:	
More Information: <a href="https://dwr.state.co.us/Tools/WellPermits/3676038O">https://dwr.state.co.us/Tools/WellPermits/3676038O</a>	

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
2	SW	0.01	36.96	9,330.65	WATER WELLS

Receipt: 10006166	Parcel Name:
WD ID:	Prcl Sze (Acres):
Associated Case No:	Lot:
County Parcel ID:	Block:
Permit: 318800-	City:
Permit Issued: 09/21/2020	County: SAN JUAN
Permit Expires: 09/21/2022	State:
Permit Category: Monitoring/Observation	Postal Code:
Current Status: Permit Issued	Township: 41.0 N

## Wells and Additional Sources Detail Report

Special Use:	Range:	7.0 W
Associated Uses:            Monitoring/Sampling	Section:	16
Permitted Area:	Q160:	NW
Permitted Area Units:	Q40:	NW
Annual Approp. (AF):	Q10:	
Well Depth (Feet):	Coords E/W (Feet):	
Top Prf. Casing (ft):	Coords E/W Dir:	
Bot Prf. Casing (ft):	Coords N/S (Feet):	
Designated Basin:	Coords N/S Dir:	
Well Constructed:	UTM x:	266722.0
First Beneficial Use:	UTM y:	4188753.0
Pump Installed:	Location:	(37.816399, -107.650185)
Well Plugged:	Location Type:	Well (Application/Permit)
Yield (GPM):	Location Accuracy:	User supplied
Static Water Level (ft):	Elevation:	
Denver Basin Aquifer:            No	Latitude:	37.816399
Static Water Level Date:	Longitude:	-107.650185
Modified:                            09/21/2020 10:48:00 AM	Management District:	
Associated Aquifers:            ALL UNNAMED AQUIFERS	Division:	7
Water District:                    30	Principal Meridian:	N
Contact Name:                    SUNNYSIDE GOLD CORPORATION	ID Key:	10006166 296616
Counties:		
Well Name:		
Comment:		
Address:		
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/10006166">https://dwr.state.co.us/Tools/WellPermits/10006166</a>	

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
3	WSW	0.01	41.38	9,489.88	WATER WELLS

Receipt:                            0362522	Parcel Name:
WD ID:	Parcel Size (Acres):
Associated Case No:	Lot:
County Parcel ID:	Block:
Permit:                            43089-F	City:
Permit Issued:                    12/23/1993	County:                            SAN JUAN
Permit Expires:                   12/23/1994	State:
Permit Category:                General Purpose	Postal Code:
Current Status:                 Well Constructed	Township:                        41.0 N
Special Use:	Range:                            7.0 W
Associated Uses:                Other	Section:                           9
Permitted Area:	Q160:                              SW
Permitted Area Units:	Q40:                                SW
Annual Approp. (AF):	Q10:
Well Depth (Feet):	Coords E/W (Feet):            1200
Top Prf. Casing (ft):	Coords E/W Dir:                W



## Wells and Additional Sources Detail Report

Bot Prf. Csng (ft):	Coords N/S (Feet):	1110
Designated Basin:	Coords N/S Dir:	S
Well Constructed:	UTM x:	266977.0
Frst Bneficial Use:	UTM y:	4189269.5
Pump Installed:	Location:	(37.82111, -107.647457)
Well Plugged:	Location Type:	Well (Application/Permit)
Yield (GPM):	Location Accuracy:	Spotted from section lines
Statc Wtr Lvl (ft):	Elevation:	
Denver Basn Aqufr:	Latitude:	37.821110
Statc Wtr Lvl Dt:	Longitude:	-107.647457
Modified:	Mangemnt District:	
Associated Aqufrs:	Division:	7
Water District:	Principle Meridian:	N
Contact Name:	ID Key:	0362522 296616
SUNNYSIDE GOLD CORPORATION		
Counties:		
Well Name:		
Comment:		
Address:		
More Information: <a href="https://dwr.state.co.us/Tools/WellPermits/0362522">https://dwr.state.co.us/Tools/WellPermits/0362522</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
4	SW	0.01	68.38	9,335.12	WATER WELLS

Receipt:	Parcel Name:	
WD ID:	Prcl Sze (Acres):	
Associated Case No:	Lot:	
County Parcel ID:	Block:	
Permit:	City:	
Permit Issued:	County:	SAN JUAN
Permit Expires:	State:	
Permit Category:	Postal Code:	
Current Status:	Township:	41.0 N
Special Use:	Range:	7.0 W
Associated Uses:	Section:	16
Permitted Area:	Q160:	NW
Permtted Area Unts:	Q40:	NW
Annul Approp. (AF):	Q10:	
Well Depth (Feet):	Coords E/W (Feet):	
Top Prf. Csng (ft):	Coords E/W Dir:	
Bot Prf. Csng (ft):	Coords N/S (Feet):	
Designated Basin:	Coords N/S Dir:	
Well Constructed:	UTM x:	266811.0
Frst Bneficial Use:	UTM y:	4188784.0
Pump Installed:	Location:	(37.816701, -107.649185)
Well Plugged:	Location Type:	Well (Application/Permit)
Yield (GPM):	Location Accuracy:	User supplied

## Wells and Additional Sources Detail Report

Statc Wtr Lvl (ft):	Elevation:
Denver Basn Aqufr: No	Latitude: 37.816701
Statc Watr Lvl Dt:	Longitude: -107.649185
Modified: 09/21/2020 10:35:00 AM	Mangemnt District:
Associated Aqufrs: ALL UNNAMED AQUIFERS	Division: 7
Water District: 30	Principle Meridian: N
Contact Name: SUNNYSIDE GOLD CORPORATION	ID Key: 10006164 296616
Counties:	
Well Name:	
Comment:	
Address:	
More Information: <a href="https://dwr.state.co.us/Tools/WellPermits/10006164">https://dwr.state.co.us/Tools/WellPermits/10006164</a>	

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
5	SW	0.02	84.10	9,376.21	WATER WELLS

Receipt: 10006158	Parcel Name:
WD ID:	Prcl Sze (Acres):
Associated Case No:	Lot:
County Parcel ID:	Block:
Permit: 318789-	City:
Permit Issued: 09/21/2020	County: SAN JUAN
Permit Expires: 09/21/2022	State:
Permit Category: Monitoring/Observation	Postal Code:
Current Status: Permit Issued	Township: 41.0 N
Special Use:	Range: 7.0 W
Associated Uses: Monitoring/Sampling	Section: 9
Permitted Area:	Q160: SE
Permttd Area Unts:	Q40: SW
Annul Approp. (AF):	Q10:
Well Depth (Feet):	Coords E/W (Feet):
Top Prf. Csng (ft):	Coords E/W Dir:
Bot Prf. Csng (ft):	Coords N/S (Feet):
Designated Basin:	Coords N/S Dir:
Well Constructed:	UTM x: 267430.0
Frst Bneficial Use:	UTM y: 4189164.0
Pump Installed:	Location: (37.82028, -107.642282)
Well Plugged:	Location Type: Well (Application/Permit)
Yield (GPM):	Location Accuracy: User supplied
Statc Wtr Lvl (ft):	Elevation:
Denver Basn Aqufr: No	Latitude: 37.820280
Statc Watr Lvl Dt:	Longitude: -107.642282
Modified: 09/21/2020 09:24:00 AM	Mangemnt District:
Associated Aqufrs: ALL UNNAMED AQUIFERS	Division: 7
Water District: 30	Principle Meridian: N
Contact Name: SUNNYSIDE GOLD CORPORATION	ID Key: 10006158 296616

## Wells and Additional Sources Detail Report

Counties:

Well Name:

Comment:

Address:

More Information: <https://dwr.state.co.us/Tools/WellPermits/10006158>

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
5	SW	0.02	84.10	9,376.21	WATER WELLS

Receipt:	10006159	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	318791-	City:	
Permit Issued:	09/21/2020	County:	SAN JUAN
Permit Expires:	09/21/2022	State:	
Permit Category:	Monitoring/Observation	Postal Code:	
Current Status:	Permit Issued	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Monitoring/Sampling	Section:	9
Permitted Area:		Q160:	SE
Permitted Area Unts:		Q40:	SW
Annul Approp. (AF):		Q10:	
Well Depth (Feet):		Coords E/W (Feet):	
Top Prf. Csng (ft):		Coords E/W Dir:	
Bot Prf. Csng (ft):		Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:		UTM x:	267430.0
Frst Bneficial Use:		UTM y:	4189164.0
Pump Installed:		Location:	(37.82028, -107.642282)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	User supplied
Statc Wtr Lvl (ft):		Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.820280
Statc Watr Lvl Dt:		Longitude:	-107.642282
Modified:	09/21/2020 09:58:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	SUNNYSIDE GOLD CORPORATION	ID Key:	10006159 296616

Counties:

Well Name:

Comment:

Address:

More Information: <https://dwr.state.co.us/Tools/WellPermits/10006159>

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
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## Wells and Additional Sources Detail Report

6	NE	0.03	140.83	9,714.51	WATER WELLS
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Receipt:	0056963	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	56963-MH	City:	
Permit Issued:	07/17/2017	County:	SAN JUAN
Permit Expires:	10/15/2017	State:	
Permit Category:	Monitoring Hole (Notice of Intent)	Postal Code:	
Current Status:	Well Constructed	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Monitoring/Sampling	Section:	10
Permitted Area:		Q160:	NW
Permtted Area Unts:		Q40:	NE
Annul Approp. (AF):		Q10:	
Well Depth (Feet):	70	Coords E/W (Feet):	
Top Prf. Csng (ft):		Coords E/W Dir:	
Bot Prf. Csng (ft):		Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:	07/16/2017	UTM x:	268693.0
Frst Bneficial Use:		UTM y:	4190151.7
Pump Installed:		Location:	(37.829497, -107.628262)
Well Plugged:		Location Type:	Well (Construction Report)
Yield (GPM):		Location Accuracy:	User supplied
Statc Wtr Lvl (ft):	40.21	Elevation:	9698
Denver Basn Aqufr:	No	Latitude:	37.829497
Statc Watr Lvl Dt:	2017/07/15	Longitude:	-107.628262
Modified:	05/16/2018 08:28:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	SUNNYSIDE GOLD CORPORATION	ID Key:	0056963 296616
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/0056963">https://dwr.state.co.us/Tools/WellPermits/0056963</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
7	WSW	0.03	157.45	9,344.17	WATER WELLS

Receipt:	10006163	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	318795-	City:	

## Wells and Additional Sources Detail Report

Permit Issued:	09/21/2020	County:	SAN JUAN
Permit Expires:	09/21/2022	State:	
Permit Category:	Monitoring/Observation	Postal Code:	
Current Status:	Permit Issued	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Monitoring/Sampling	Section:	16
Permitted Area:		Q160:	NW
Permitted Area Units:		Q40:	NW
Annul Approp. (AF):		Q10:	
Well Depth (Feet):		Coords E/W (Feet):	
Top Prf. Csng (ft):		Coords E/W Dir:	
Bot Prf. Csng (ft):		Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:		UTM x:	266872.0
First Beneficial Use:		UTM y:	4188930.0
Pump Installed:		Location:	(37.818031, -107.64854)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	User supplied
Static Water Level (ft):		Elevation:	
Denver Basin Aquifer:	No	Latitude:	37.818031
Static Water Level Date:		Longitude:	-107.648540
Modified:	09/21/2020 10:25:00 AM	Management District:	
Associated Aquifers:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principal Meridian:	N
Contact Name:	SUNNYSIDE GOLD CORPORATION	ID Key:	10006163 296616
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/10006163">https://dwr.state.co.us/Tools/WellPermits/10006163</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
8	ENE	0.04	203.74	9,689.82	WATER WELLS

Receipt:	3676038R	Parcel Name:	
WD ID:		Parcel Size (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	302544-	City:	
Permit Issued:	08/26/2016	County:	SAN JUAN
Permit Expires:		State:	
Permit Category:	Monitoring/Observation	Postal Code:	
Current Status:	Well Constructed	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Monitoring/Sampling	Section:	10
Permitted Area:		Q160:	NW



## Wells and Additional Sources Detail Report

Permitted Area Units:	Q40:	NE
Annul Approp. (AF):	Q10:	
Well Depth (Feet): 80	Coords E/W (Feet):	
Top Prf. Csng (ft): 70	Coords E/W Dir:	
Bot Prf. Csng (ft): 80	Coords N/S (Feet):	
Designated Basin:	Coords N/S Dir:	
Well Constructed: 09/09/2015	UTM x:	268678.0
Frst Bneficial Use:	UTM y:	4190120.0
Pump Installed:	Location:	(37.829205, -107.628422)
Well Plugged:	Location Type:	Well (Application/Permit)
Yield (GPM):	Location Accuracy:	User supplied
Statc Wtr Lvl (ft): 48.00	Elevation:	
Denver Basn Aqufr:	Latitude:	37.829205
Statc Wtr Lvl Dt: 2015/09/09	Longitude:	-107.628422
Modified: 08/19/2016 12:00:00 AM	Mangemnt District:	
Associated Aqufrs: ALL UNNAMED AQUIFERS	Division:	7
Water District: 30	Principle Meridian:	N
Contact Name: SUNNYSIDE GOLD CORPORATION	ID Key:	3676038R 296616
Counties:		
Well Name:		
Comment:		
Address:		
More Information: <a href="https://dwr.state.co.us/Tools/WellPermits/3676038R">https://dwr.state.co.us/Tools/WellPermits/3676038R</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
10	SW	0.05	261.75	9,343.38	WATER WELLS

Receipt: 10006162	Parcel Name:
WD ID:	Prcl Sze (Acres):
Associated Case No:	Lot:
County Parcel ID:	Block:
Permit: 318794-	City:
Permit Issued: 09/21/2020	County: SAN JUAN
Permit Expires: 09/21/2022	State:
Permit Category: Monitoring/Observation	Postal Code:
Current Status: Permit Issued	Township: 41.0 N
Special Use:	Range: 7.0 W
Associated Uses: Monitoring/Sampling	Section: 16
Permitted Area:	Q160: NW
Permitted Area Units:	Q40: NW
Annul Approp. (AF):	Q10:
Well Depth (Feet):	Coords E/W (Feet):
Top Prf. Csng (ft):	Coords E/W Dir:
Bot Prf. Csng (ft):	Coords N/S (Feet):
Designated Basin:	Coords N/S Dir:
Well Constructed:	UTM x: 266911.0

## Wells and Additional Sources Detail Report

First Beneficial Use:	UTM y:	4188895.0
Pump Installed:	Location:	(37.817726, -107.648086)
Well Plugged:	Location Type:	Well (Application/Permit)
Yield (GPM):	Location Accuracy:	User supplied
Static Water Level (ft):	Elevation:	
Denver Basin Aquifer: No	Latitude:	37.817726
Static Water Level Date:	Longitude:	-107.648086
Modified: 09/21/2020 10:13:00 AM	Management District:	
Associated Aquifers: ALL UNNAMED AQUIFERS	Division:	7
Water District: 30	Principle Meridian:	N
Contact Name: SUNNYSIDE GOLD CORPORATION	ID Key:	10006162 296616
Counties:		
Well Name:		
Comment:		
Address:		
More Information: <a href="https://dwr.state.co.us/Tools/WellPermits/10006162">https://dwr.state.co.us/Tools/WellPermits/10006162</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
11	SW	0.06	308.78	9,384.49	WATER WELLS

Receipt: 10006147	Parcel Name:
WD ID:	Parcel Size (Acres):
Associated Case No:	Lot:
County Parcel ID:	Block:
Permit: 318779-	City:
Permit Issued: 09/21/2020	County: SAN JUAN
Permit Expires: 09/21/2022	State:
Permit Category: Monitoring/Observation	Postal Code:
Current Status: Permit Issued	Township: 41.0 N
Special Use:	Range: 7.0 W
Associated Uses: Monitoring/Sampling	Section: 9
Permitted Area:	Q160: SE
Permitted Area Units:	Q40: SW
Annual Approp. (AF):	Q10:
Well Depth (Feet):	Coords E/W (Feet):
Top Profile Casing (ft):	Coords E/W Dir:
Bottom Profile Casing (ft):	Coords N/S (Feet):
Designated Basin:	Coords N/S Dir:
Well Constructed:	UTM x: 267544.0
First Beneficial Use:	UTM y: 4189273.0
Pump Installed:	Location: (37.821291, -107.641023)
Well Plugged:	Location Type: Well (Application/Permit)
Yield (GPM):	Location Accuracy: User supplied
Static Water Level (ft):	Elevation:
Denver Basin Aquifer: No	Latitude: 37.821291
Static Water Level Date:	Longitude: -107.641023

## Wells and Additional Sources Detail Report

Modified:	09/21/2020 08:46:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	SUNNYSIDE GOLD CORPORATION	ID Key:	10006147 296616
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/10006147">https://dwr.state.co.us/Tools/WellPermits/10006147</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
12	SW	0.07	345.24	9,343.52	WATER WELLS

Receipt:	10006161	Parcel Name:	
WD ID:		PrcI Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	318793-	City:	
Permit Issued:	09/21/2020	County:	SAN JUAN
Permit Expires:	09/21/2022	State:	
Permit Category:	Monitoring/Observation	Postal Code:	
Current Status:	Permit Issued	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Monitoring/Sampling	Section:	16
Permitted Area:		Q160:	NW
Permtted Area Unts:		Q40:	NW
Annul Approp. (AF):		Q10:	
Well Depth (Feet):		Coords E/W (Feet):	
Top Prf. Csng (ft):		Coords E/W Dir:	
Bot Prf. Csng (ft):		Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:		UTM x:	266955.0
Frst Bneficial Use:		UTM y:	4188866.0
Pump Installed:		Location:	(37.817476, -107.647577)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	User supplied
Statc Wtr Lvl (ft):		Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.817476
Statc Watr Lvl Dt:		Longitude:	-107.647577
Modified:	09/21/2020 10:08:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	SUNNYSIDE GOLD CORPORATION	ID Key:	10006161 296616
Counties:			
Well Name:			
Comment:			

## Wells and Additional Sources Detail Report

Address:

More Information: <https://dwr.state.co.us/Tools/WellPermits/10006161>

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
14	WSW	0.08	435.25	9,442.81	WATER WELLS

Receipt:	0065093	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	81579-	City:	
Permit Issued:	10/31/1977	County:	SAN JUAN
Permit Expires:		State:	
Permit Category:	Residential	Postal Code:	
Current Status:	Permit Expired	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Domestic	Section:	8
Permitted Area:		Q160:	SE
Permitted Area Unts:		Q40:	SE
Annul Approp. (AF):		Q10:	
Well Depth (Feet):		Coords E/W (Feet):	200
Top Prf. Csng (ft):		Coords E/W Dir:	E
Bot Prf. Csng (ft):		Coords N/S (Feet):	250
Designated Basin:		Coords N/S Dir:	S
Well Constructed:		UTM x:	266541.6
Frst Bneficial Use:		UTM y:	4189020.3
Pump Installed:		Location:	(37.818757, -107.652314)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	Spotted from section lines
Statc Wtr Lvl (ft):		Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.818757
Statc Watr Lvl Dt:		Longitude:	-107.652314
Modified:	12/18/2006 12:00:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	LA, CHAPELLE	ID Key:	0065093 147190
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/0065093">https://dwr.state.co.us/Tools/WellPermits/0065093</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
15	ENE	0.08	445.77	9,695.56	WATER WELLS

Receipt:	3676038P	Parcel Name:	
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## Wells and Additional Sources Detail Report

WD ID: Associated Case No: County Parcel ID: Permit: 302542- Permit Issued: 08/26/2016 Permit Expires: Permit Category: Monitoring/Observation Current Status: Well Constructed Special Use: Associated Uses: Monitoring/Sampling Permitted Area: Permitted Area Units: Annual Approp. (AF): Well Depth (Feet): 92 Top Prf. Casing (ft): 82 Bot Prf. Casing (ft): 92 Designated Basin: Well Constructed: 09/10/2015 First Beneficial Use: Pump Installed: Well Plugged: Yield (GPM): Static Wtr Lvl (ft): 70.00 Denver Basin Aquifer: No Static Wtr Lvl Dt: 2015/09/10 Modified: 08/19/2016 12:00:00 AM Associated Aquifers: ALL UNNAMED AQUIFERS Water District: 30 Contact Name: SUNNYSIDE GOLD CORPORATION  Counties: Well Name: Comment: Address: More Information: <a href="https://dwr.state.co.us/Tools/WellPermits/3676038P">https://dwr.state.co.us/Tools/WellPermits/3676038P</a>	Prcl Size (Acres): Lot: Block: City: County: SAN JUAN State: Postal Code: Township: 41.0 N Range: 7.0 W Section: 10 Q160: NW Q40: NE Q10: Coords E/W (Feet): Coords E/W Dir: Coords N/S (Feet): Coords N/S Dir: UTM x: 268777.0 UTM y: 4190109.0 Location: (37.829131, -107.627295) Location Type: Well (Application/Permit) Location Accuracy: User supplied Elevation: Latitude: 37.829131 Longitude: -107.627295 Management District: Division: 7 Principle Meridian: N ID Key: 3676038P 296616
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Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
16	ENE	0.09	463.33	9,695.56	WATER WELLS

Receipt: 3676038Q WD ID: Associated Case No: County Parcel ID: Permit: 302543- Permit Issued: 08/26/2016 Permit Expires: Permit Category: Monitoring/Observation	Parcel Name: Prcl Size (Acres): Lot: Block: City: County: SAN JUAN State: Postal Code:
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## Wells and Additional Sources Detail Report

Current Status:	Well Constructed	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Monitoring/Sampling	Section:	10
Permitted Area:		Q160:	NW
Permitted Area Unts:		Q40:	NE
Annul Approp. (AF):		Q10:	
Well Depth (Feet):	132	Coords E/W (Feet):	
Top Prf. Csng (ft):	107	Coords E/W Dir:	
Bot Prf. Csng (ft):	123	Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:	09/11/2015	UTM x:	268782.0
Frst Bneficial Use:		UTM y:	4190107.0
Pump Installed:		Location:	(37.829114, -107.627237)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	User supplied
Statc Wtr Lvl (ft):	110.00	Elevation:	
Denver Basn Aquifr:	No	Latitude:	37.829114
Statc Wtr Lvl Dt:	2015/09/11	Longitude:	-107.627237
Modified:	08/19/2016 12:00:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	SUNNYSIDE GOLD CORPORATION	ID Key:	3676038Q 296616
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/3676038Q">https://dwr.state.co.us/Tools/WellPermits/3676038Q</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
18	ENE	0.16	819.44	9,919.05	WATER WELLS

Receipt:	10014092	Parcel Name:	COLE RANCH
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	323100-	City:	
Permit Issued:	08/02/2021	County:	SAN JUAN
Permit Expires:	08/02/2023	State:	
Permit Category:	Residential	Postal Code:	
Current Status:	Permit Issued	Township:	42.0 N
Special Use:		Range:	6.0 W
Associated Uses:	Household use only	Section:	30
Permitted Area:		Q160:	SE
Permitted Area Unts:		Q40:	SW
Annul Approp. (AF):		Q10:	
Well Depth (Feet):		Coords E/W (Feet):	

## Wells and Additional Sources Detail Report

Top Prf. Csng (ft):		Coords E/W Dir:	
Bot Prf. Csng (ft):		Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:		UTM x:	274197.0
Frst Bneficial Use:		UTM y:	4193747.8
Pump Installed:		Location:	(37.863252, -107.566904)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	Spotted from quarters
Statc Wtr Lvl (ft):		Elevation:	
Denver Basn Aquifr:	No	Latitude:	37.863252
Statc Wtr Lvl Dt:		Longitude:	-107.566904
Modified:	08/02/2021 10:40:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	RILEY III, GEORGE W.	ID Key:	10014092 421549
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/10014092">https://dwr.state.co.us/Tools/WellPermits/10014092</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
19	NE	0.16	838.22	9,810.24	WATER WELLS

Receipt:	10003282	Parcel Name:	COLE RANCH
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	317355-	City:	
Permit Issued:	05/14/2020	County:	SAN JUAN
Permit Expires:	05/14/2022	State:	
Permit Category:	Residential	Postal Code:	
Current Status:	Permit Issued	Township:	42.0 N
Special Use:		Range:	6.0 W
Associated Uses:	Domestic	Section:	30
Permitted Area:		Q160:	SW
Permttd Area Unts:		Q40:	SE
Annul Approp. (AF):		Q10:	
Well Depth (Feet):		Coords E/W (Feet):	
Top Prf. Csng (ft):		Coords E/W Dir:	
Bot Prf. Csng (ft):		Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:		UTM x:	273938.0
Frst Bneficial Use:		UTM y:	4193758.0
Pump Installed:		Location:	(37.86328, -107.569848)
Well Plugged:		Location Type:	Well (Application/Permit)

## Wells and Additional Sources Detail Report

Yield (GPM):		Location Accuracy:	User supplied
Statc Wtr Lvl (ft):		Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.863280
Statc Wtr Lvl Dt:		Longitude:	-107.569848
Modified:	05/14/2020 03:41:00 PM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	RILEY III, GEORGE W.	ID Key:	10003282 421549
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/10003282">https://dwr.state.co.us/Tools/WellPermits/10003282</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
20	ESE	0.16	841.95	9,461.64	WATER WELLS

Receipt:	9702273	Parcel Name:	TIGER MILL SITE
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	269929-	City:	
Permit Issued:	07/26/2006	County:	SAN JUAN
Permit Expires:	07/26/2008	State:	
Permit Category:	Residential	Postal Code:	
Current Status:	Well Constructed	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Domestic	Section:	10
Permitted Area:		Q160:	NW
Permtted Area Unts:		Q40:	SE
Annul Approp. (AF):		Q10:	
Well Depth (Feet):	205	Coords E/W (Feet):	
Top Prf. Csng (ft):	105	Coords E/W Dir:	
Bot Prf. Csng (ft):	205	Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:	06/21/2007	UTM x:	268851.4
Frst Bneficial Use:		UTM y:	4189878.8
Pump Installed:		Location:	(37.827079, -107.626381)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	User supplied
Statc Wtr Lvl (ft):	97.00	Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.827079
Statc Wtr Lvl Dt:	2007/06/21	Longitude:	-107.626381
Modified:	03/24/2009 12:00:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N

## Wells and Additional Sources Detail Report

Contact Name: DAVIS, ANTHONY W ID Key: 9702273 355057  
 Counties:  
 Well Name:  
 Comment:  
 Address:  
 More Information: <https://dwr.state.co.us/Tools/WellPermits/9702273>

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
23	NE	0.20	1,053.83	9,818.51	WATER WELLS

Receipt:	9700425	Parcel Name:	JOHN H FRENCH PLACER #45
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	232483-	City:	
Permit Issued:	05/15/2001	County:	SAN JUAN
Permit Expires:	05/15/2003	State:	
Permit Category:	Residential	Postal Code:	
Current Status:	Well Constructed	Township:	42.0 N
Special Use:		Range:	6.0 W
Associated Uses:	Domestic	Section:	30
Permitted Area:		Q160:	SW
Permtted Area Unts:		Q40:	SE
Annul Approp. (AF):		Q10:	
Well Depth (Feet):	80	Coords E/W (Feet):	2483
Top Prf. Csng (ft):		Coords E/W Dir:	W
Bot Prf. Csng (ft):		Coords N/S (Feet):	396
Designated Basin:		Coords N/S Dir:	S
Well Constructed:	04/30/2003	UTM x:	273960.4
Frst Bneficial Use:		UTM y:	4193674.4
Pump Installed:		Location:	(37.862529, -107.569572)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	Spotted from section lines
Statc Wtr Lvl (ft):		Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.862529
Statc Watr Lvl Dt:		Longitude:	-107.569572
Modified:	11/23/2009 12:00:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	SCHAEFER, MERLIN	ID Key:	9700425 59663
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/9700425">https://dwr.state.co.us/Tools/WellPermits/9700425</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
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## Wells and Additional Sources Detail Report

24 SW 0.21 1,091.35 9,773.31 WATER WELLS

Receipt:	0031288	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	31288-MH	City:	
Permit Issued:	07/25/1997	County:	SAN JUAN
Permit Expires:	10/25/1997	State:	
Permit Category:	Monitoring Hole (Notice of Intent)	Postal Code:	
Current Status:	Permit Issued	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Monitoring/Sampling	Section:	16
Permitted Area:		Q160:	NW
Permttd Area Unts:		Q40:	SW
Annul Approp. (AF):		Q10:	
Well Depth (Feet):		Coords E/W (Feet):	
Top Prf. Csng (ft):		Coords E/W Dir:	
Bot Prf. Csng (ft):		Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:		UTM x:	266993.7
Frst Bneficial Use:		UTM y:	4188526.5
Pump Installed:		Location:	(37.814429, -107.647029)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	Spotted from quarters
Statc Wtr Lvl (ft):		Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.814429
Statc Watr Lvl Dt:		Longitude:	-107.647029
Modified:	07/23/1997 12:00:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	US BUREAU OF RECLAMATION	ID Key:	0031288 308703
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/0031288">https://dwr.state.co.us/Tools/WellPermits/0031288</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
28	SW	0.28	1,478.50	9,908.31	WATER WELLS

Receipt:	0215401	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	



## Wells and Additional Sources Detail Report

Permit:	25713-F	City:	
Permit Issued:	04/07/1982	County:	SAN JUAN
Permit Expires:		State:	
Permit Category:	General Purpose	Postal Code:	
Current Status:	Permit Expired	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Industrial	Section:	16
Permitted Area:		Q160:	NE
Permitted Area Units:		Q40:	NW
Annual Approp. (AF):		Q10:	
Well Depth (Feet):		Coords E/W (Feet):	3300
Top Prf. Casing (ft):		Coords E/W Dir:	W
Bot Prf. Casing (ft):		Coords N/S (Feet):	780
Designated Basin:		Coords N/S Dir:	N
Well Constructed:		UTM x:	267598.3
First Beneficial Use:		UTM y:	4188675.0
Pump Installed:		Location:	(37.81592, -107.640218)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	Spotted from section lines
Static Water Level (ft):		Elevation:	
Denver Basin Aquifer:	No	Latitude:	37.815920
Static Water Level Date:		Longitude:	-107.640218
Modified:	03/03/2014 12:00:00 AM	Management District:	
Associated Aquifers:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	DURANGO GOLD CO INC	ID Key:	0215401 55362
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/0215401">https://dwr.state.co.us/Tools/WellPermits/0215401</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
31	WSW	0.31	1,620.11	9,310.41	WATER WELLS

Receipt:	0031287	Parcel Name:	
WD ID:		Parcel Size (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	31287-MH	City:	
Permit Issued:	07/25/1997	County:	SAN JUAN
Permit Expires:	10/25/1997	State:	
Permit Category:	Monitoring Hole (Notice of Intent)	Postal Code:	
Current Status:	Permit Issued	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Monitoring/Sampling	Section:	17

## Wells and Additional Sources Detail Report

Permitted Area:		Q160:	NE
Permitted Area Units:		Q40:	SE
Annul Approp. (AF):		Q10:	
Well Depth (Feet):		Coords E/W (Feet):	
Top Prf. Csng (ft):		Coords E/W Dir:	
Bot Prf. Csng (ft):		Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:		UTM x:	266186.1
First Beneficial Use:		UTM y:	4188555.4
Pump Installed:		Location:	(37.814483, -107.656203)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	Spotted from quarters
Static Wtr Lvl (ft):		Elevation:	
Denver Basin Aquifer:	No	Latitude:	37.814483
Static Wtr Lvl Dt:		Longitude:	-107.656203
Modified:	07/23/1997 12:00:00 AM	Management District:	
Associated Aquifers:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	US BUREAU OF RECLAMATION	ID Key:	0031287 308703
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/0031287">https://dwr.state.co.us/Tools/WellPermits/0031287</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
32	ESE	0.31	1,660.66	9,622.88	WATER WELLS

Receipt:	9703903	Parcel Name:	ALEXANDRIA LODGE, USMS NO. 14024
WD ID:		Parcel Size (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	302801-	City:	SILVERTON
Permit Issued:	09/14/2016	County:	SAN JUAN
Permit Expires:	09/14/2018	State:	CO
Permit Category:	Residential	Postal Code:	81433
Current Status:	Well Constructed	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Domestic	Section:	10
Permitted Area:		Q160:	NE
Permitted Area Units:		Q40:	SW
Annul Approp. (AF):		Q10:	
Well Depth (Feet):	200	Coords E/W (Feet):	
Top Prf. Csng (ft):		Coords E/W Dir:	
Bot Prf. Csng (ft):		Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	

## Wells and Additional Sources Detail Report

Well Constructed:	06/20/2017	UTM x:	269072.0
Frst Bneficial Use:		UTM y:	4189751.0
Pump Installed:	06/29/2017	Location:	(37.825982, -107.623832)
Well Plugged:		Location Type:	Well (Construction Report)
Yield (GPM):	2.00	Location Accuracy:	GPS
Statc Wtr Lvl (ft):	70.00	Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.825982
Statc Watr Lvl Dt:	2017/06/29	Longitude:	-107.623832
Modified:	07/24/2017 11:33:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	BRIDGEWATER VERNON & AMY	ID Key:	9703903 47036
Counties:			
Well Name:			
Comment:			
Address:	471 CR 52		
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/9703903">https://dwr.state.co.us/Tools/WellPermits/9703903</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
33	SW	0.32	1,679.81	9,405.78	WATER WELLS

Receipt:	9124716	Parcel Name:	
WD ID:	3005055	Prcl Sze (Acres):	
Associated Case No:	W0959	Lot:	
County Parcel ID:		Block:	
Permit:	6661-F	City:	
Permit Issued:		County:	SAN JUAN
Permit Expires:		State:	
Permit Category:	General Purpose	Postal Code:	
Current Status:	Well Constructed	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Municipal	Section:	17
Permitted Area:		Q160:	NE
Permttd Area Unts:		Q40:	SE
Annul Approp. (AF):		Q10:	
Well Depth (Feet):	122	Coords E/W (Feet):	
Top Prf. Csng (ft):		Coords E/W Dir:	
Bot Prf. Csng (ft):		Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:	10/01/1964	UTM x:	266381.1
Frst Bneficial Use:	10/01/1964	UTM y:	4188347.7
Pump Installed:		Location:	(37.812663, -107.653923)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	Spotted from quarters
Statc Wtr Lvl (ft):	42.00	Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.812663

## Wells and Additional Sources Detail Report

Statc Watr Lvl Dt:	2005/02/10	Longitude:	-107.653923
Modified:		Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	SILVERTON TOWN OF	ID Key:	9124716 129041
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/9124716">https://dwr.state.co.us/Tools/WellPermits/9124716</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
33	SW	0.32	1,679.81	9,405.78	WATER WELLS

Receipt:	9124717	Parcel Name:	
WD ID:	3005056	Prcl Sze (Acres):	
Associated Case No:	W0959	Lot:	
County Parcel ID:		Block:	
Permit:	6662-F	City:	
Permit Issued:		County:	SAN JUAN
Permit Expires:		State:	
Permit Category:	General Purpose	Postal Code:	
Current Status:	Well Constructed	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Municipal	Section:	17
Permitted Area:		Q160:	NE
Permtted Area Unts:		Q40:	SE
Annul Approp. (AF):		Q10:	
Well Depth (Feet):	97	Coords E/W (Feet):	
Top Prf. Csng (ft):		Coords E/W Dir:	
Bot Prf. Csng (ft):		Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:	11/08/1964	UTM x:	266381.1
Frst Bneficial Use:	11/08/1964	UTM y:	4188347.7
Pump Installed:		Location:	(37.812663, -107.653923)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	Spotted from quarters
Statc Wtr Lvl (ft):	20.00	Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.812663
Statc Watr Lvl Dt:	2005/02/10	Longitude:	-107.653923
Modified:		Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	SILVERTON TOWN OF	ID Key:	9124717 129041
Counties:			
Well Name:			

## Wells and Additional Sources Detail Report

Comment:

Address:

More Information: <https://dwr.state.co.us/Tools/WellPermits/9124717>

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
34	ENE	0.33	1,746.44	9,779.82	WATER WELLS

Receipt:	0451134	Parcel Name:	JOHN H FRENCH PLACER MS #45
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	220122-	City:	
Permit Issued:	09/14/1999	County:	SAN JUAN
Permit Expires:	09/14/2001	State:	
Permit Category:	Residential	Postal Code:	
Current Status:	Permit Expired	Township:	42.0 N
Special Use:		Range:	6.0 W
Associated Uses:	Domestic	Section:	31
Permitted Area:		Q160:	NW
Permtted Area Unts:		Q40:	NE
Annul Approp. (AF):		Q10:	
Well Depth (Feet):		Coords E/W (Feet):	1900
Top Prf. Csng (ft):		Coords E/W Dir:	W
Bot Prf. Csng (ft):		Coords N/S (Feet):	100
Designated Basin:		Coords N/S Dir:	N
Well Constructed:		UTM x:	273777.8
Frst Bneficial Use:		UTM y:	4193528.7
Pump Installed:		Location:	(37.861178, -107.571594)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	Spotted from section lines
Statc Wtr Lvl (ft):		Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.861178
Statc Watr Lvl Dt:		Longitude:	-107.571594
Modified:	09/08/1999 12:00:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	JEPSON A JOSEPH	ID Key:	0451134 363415
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/0451134">https://dwr.state.co.us/Tools/WellPermits/0451134</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
36	WSW	0.33	1,761.21	9,721.63	WATER WELLS



## Wells and Additional Sources Detail Report

Receipt:	9701750	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	258508-	City:	
Permit Issued:	08/04/2004	County:	SAN JUAN
Permit Expires:	08/04/2007	State:	
Permit Category:	Residential	Postal Code:	
Current Status:	Permit Issued	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Domestic	Section:	8
Permitted Area:		Q160:	SE
Permttd Area Unts:		Q40:	SW
Annul Approp. (AF):		Q10:	
Well Depth (Feet):		Coords E/W (Feet):	1400
Top Prf. Csng (ft):		Coords E/W Dir:	E
Bot Prf. Csng (ft):		Coords N/S (Feet):	1000
Designated Basin:		Coords N/S Dir:	S
Well Constructed:		UTM x:	266183.8
Frst Bneficial Use:		UTM y:	4189261.9
Pump Installed:		Location:	(37.820844, -107.656455)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	Spotted from section lines
Statc Wtr Lvl (ft):		Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.820844
Statc Watr Lvl Dt:		Longitude:	-107.656455
Modified:	07/17/2006 12:00:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	LEDY, DAVID	ID Key:	9701750 190182
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/9701750">https://dwr.state.co.us/Tools/WellPermits/9701750</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
38	ENE	0.35	1,871.42	9,955.31	WATER WELLS

Receipt:	0539706	Parcel Name:	FOREST QUEEN # 6 LODE # 18843
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	263671-	City:	
Permit Issued:	06/13/2005	County:	SAN JUAN

## Wells and Additional Sources Detail Report

Permit Expires:	06/13/2007	State:	
Permit Category:	Residential	Postal Code:	
Current Status:	Well Constructed	Township:	42.0 N
Special Use:		Range:	6.0 W
Associated Uses:	Domestic	Section:	31
Permitted Area:		Q160:	NE
Permitted Area Units:		Q40:	NW
Annual Approp. (AF):		Q10:	
Well Depth (Feet):	153	Coords E/W (Feet):	
Top Prf. Casing (ft):	73	Coords E/W Dir:	
Bot Prf. Casing (ft):	153	Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:	06/13/2007	UTM x:	274081.0
First Beneficial Use:		UTM y:	4193400.0
Pump Installed:	09/23/2008	Location:	(37.860092, -107.568112)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):	10.00	Location Accuracy:	User supplied
Static Wtr Lvl (ft):	29.00	Elevation:	
Denver Basin Aquifer:	No	Latitude:	37.860092
Static Wtr Lvl Dt:	2007/06/13	Longitude:	-107.568112
Modified:	02/13/2009 12:00:00 AM	Management District:	
Associated Aquifers:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	SCHERER JAY & JANET	ID Key:	0539706 65459
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/0539706">https://dwr.state.co.us/Tools/WellPermits/0539706</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
40	N	0.39	2,081.42	11,532.46	WATER WELLS

Receipt:	3634951	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	279290-	City:	
Permit Issued:	11/19/2008	County:	SAN JUAN
Permit Expires:	11/19/2010	State:	
Permit Category:	Residential	Postal Code:	
Current Status:	Well Constructed	Township:	42.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Domestic	Section:	21
Permitted Area:		Q160:	NE
Permitted Area Units:		Q40:	NW

## Wells and Additional Sources Detail Report

Annul Approp. (AF):	Q10:
Well Depth (Feet): 9	Coords E/W (Feet): 1535
Top Prf. Csng (ft): 5	Coords E/W Dir: E
Bot Prf. Csng (ft): 9	Coords N/S (Feet): 1270
Designated Basin:	Coords N/S Dir: N
Well Constructed: 09/15/2010	UTM x: 267967.2
Frst Bneficial Use:	UTM y: 4196579.4
Pump Installed: 09/18/2010	Location: (37.887178, -107.638567)
Well Plugged:	Location Type: Well (Application/Permit)
Yield (GPM): 15.00	Location Accuracy: Spotted from section lines
Statc Wtr Lvl (ft): 15.00	Elevation:
Denver Basn Aqufr: No	Latitude: 37.887178
Statc Wtr Lvl Dt: 2010/09/15	Longitude: -107.638567
Modified: 11/03/2010 12:00:00 AM	Managemnt District:
Associated Aqufrs: ALL UNNAMED AQUIFERS	Division: 7
Water District: 30	Principle Meridian: N
Contact Name: RENOUX EDWARD & CLARICE	ID Key: 3634951 204358
Counties:	
Well Name:	
Comment:	
Address:	
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/3634951">https://dwr.state.co.us/Tools/WellPermits/3634951</a>

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
41	ENE	0.40	2,104.72	9,956.36	WATER WELLS

Receipt: 0528424	Parcel Name:
WD ID:	Prcl Sze (Acres):
Associated Case No:	Lot:
County Parcel ID:	Block:
Permit: 61884-F	City:
Permit Issued: 10/26/2004	County: SAN JUAN
Permit Expires: 10/26/2005	State:
Permit Category: General Purpose	Postal Code:
Current Status: Well Constructed	Township: 42.0 N
Special Use:	Range: 6.0 W
Associated Uses: Commercial	Section: 31
Permitted Area:	Q160: NE
Permtted Area Unts:	Q40: NW
Annul Approp. (AF):	Q10:
Well Depth (Feet): 143	Coords E/W (Feet): 2436
Top Prf. Csng (ft): 83	Coords E/W Dir: E
Bot Prf. Csng (ft): 143	Coords N/S (Feet): 726
Designated Basin:	Coords N/S Dir: N
Well Constructed: 04/28/2005	UTM x: 274045.8
Frst Bneficial Use:	UTM y: 4193329.6

## Wells and Additional Sources Detail Report

Pump Installed:	05/10/2005	Location:	(37.859453, -107.568488)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):	10.00	Location Accuracy:	Spotted from section lines
Statc Wtr Lvl (ft):	42.00	Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.859453
Statc Wtr Lvl Dt:	2005/04/28	Longitude:	-107.568488
Modified:	05/23/2005 12:00:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	FISHER, MICHAEL E	ID Key:	0528424 62847
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/0528424">https://dwr.state.co.us/Tools/WellPermits/0528424</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
42	ENE	0.41	2,182.06	9,764.82	WATER WELLS

Receipt:	0056196D	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	303932-	City:	
Permit Issued:	12/15/2016	County:	SAN JUAN
Permit Expires:		State:	
Permit Category:	Monitoring/Observation	Postal Code:	
Current Status:	Well Constructed	Township:	42.0 N
Special Use:		Range:	6.0 W
Associated Uses:	Monitoring/Sampling	Section:	31
Permitted Area:		Q160:	NW
Permttd Area Unts:		Q40:	NE
Annul Approp. (AF):		Q10:	
Well Depth (Feet):	15	Coords E/W (Feet):	
Top Prf. Csng (ft):		Coords E/W Dir:	
Bot Prf. Csng (ft):		Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:	10/11/2016	UTM x:	273760.0
Frst Bneficial Use:		UTM y:	4193389.0
Pump Installed:		Location:	(37.859913, -107.571754)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	User supplied
Statc Wtr Lvl (ft):		Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.859913
Statc Wtr Lvl Dt:		Longitude:	-107.571754
Modified:	12/15/2016 12:00:00 AM	Mangemnt District:	

## Wells and Additional Sources Detail Report

Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	US BUREAU OF LAND MANAGEMENT	ID Key:	0056196D 78644
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/0056196D">https://dwr.state.co.us/Tools/WellPermits/0056196D</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
43	ENE	0.43	2,248.30	9,763.34	WATER WELLS

Receipt:	0056010	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	56010-MH	City:	
Permit Issued:	10/04/2016	County:	SAN JUAN
Permit Expires:	01/02/2017	State:	
Permit Category:	Monitoring Hole (Notice of Intent)	Postal Code:	
Current Status:	Permit Issued	Township:	42.0 N
Special Use:		Range:	6.0 W
Associated Uses:	Monitoring/Sampling	Section:	31
Permitted Area:		Q160:	NW
Permtted Area Unts:		Q40:	NE
Annul Approp. (AF):		Q10:	
Well Depth (Feet):		Coords E/W (Feet):	
Top Prf. Csng (ft):		Coords E/W Dir:	
Bot Prf. Csng (ft):		Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:		UTM x:	273782.7
Frst Bneficial Use:		UTM y:	4193354.8
Pump Installed:		Location:	(37.859611, -107.571486)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	Spotted from quarters
Statc Wtr Lvl (ft):		Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.859611
Statc Watr Lvl Dt:		Longitude:	-107.571486
Modified:	10/05/2016 12:00:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	US BUREAU OF LAND MANAGEMENT	ID Key:	0056010 298953
Counties:			
Well Name:			
Comment:			
Address:			



## Wells and Additional Sources Detail Report

More Information: <https://dwr.state.co.us/Tools/WellPermits/0056010>

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
43	ENE	0.43	2,248.30	9,763.34	WATER WELLS

Receipt:	10020432	Parcel Name:	FOREST QUEEN NO. 9
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	326290-	City:	ANIMAS FORKS
Permit Issued:	04/11/2022	County:	SAN JUAN
Permit Expires:	04/11/2024	State:	CO
Permit Category:	Residential	Postal Code:	81433
Current Status:	Permit Issued	Township:	42.0 N
Special Use:		Range:	6.0 W
Associated Uses:	Domestic	Section:	31
Permitted Area:		Q160:	NW
Permtted Area Unts:		Q40:	NE
Annul Approp. (AF):		Q10:	
Well Depth (Feet):		Coords E/W (Feet):	
Top Prf. Csng (ft):		Coords E/W Dir:	
Bot Prf. Csng (ft):		Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:		UTM x:	273782.7
Frst Bneficial Use:		UTM y:	4193354.8
Pump Installed:		Location:	(37.859611, -107.571486)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	Spotted from quarters
Stata Wtr Lvl (ft):		Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.859611
Stata Wtr Lvl Dt:		Longitude:	-107.571486
Modified:	04/11/2022 01:21:00 PM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	STALZER, STEVE	ID Key:	10020432 459697
Counties:			
Well Name:			
Comment:			
Address:	CR 23		
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/10020432">https://dwr.state.co.us/Tools/WellPermits/10020432</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
43	ENE	0.43	2,248.30	9,763.34	WATER WELLS

Receipt:	10020432	Parcel Name:	FOREST QUEEN NO. 9
WD ID:		Prcl Sze (Acres):	

## Wells and Additional Sources Detail Report

Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	326290-	City:	ANIMAS FORKS
Permit Issued:	04/11/2022	County:	SAN JUAN
Permit Expires:	04/11/2024	State:	CO
Permit Category:	Residential	Postal Code:	81433
Current Status:	Permit Issued	Township:	42.0 N
Special Use:		Range:	6.0 W
Associated Uses:	Domestic	Section:	31
Permitted Area:		Q160:	NW
Permitted Area Units:		Q40:	NE
Annual Approp. (AF):		Q10:	
Well Depth (Feet):		Coords E/W (Feet):	
Top Prf. Csng (ft):		Coords E/W Dir:	
Bot Prf. Csng (ft):		Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:		UTM x:	273782.7
First Beneficial Use:		UTM y:	4193354.8
Pump Installed:		Location:	(37.859611, -107.571486)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	Spotted from quarters
Static Water Level (ft):		Elevation:	
Denver Basin Aquifer:	No	Latitude:	37.859611
Static Water Level Date:		Longitude:	-107.571486
Modified:	04/11/2022 01:21:00 PM	Management District:	
Associated Aquifers:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principal Meridian:	N
Contact Name:	STALZER, MELANIE	ID Key:	10020432 459698
Counties:			
Well Name:			
Comment:			
Address:	CR 23		
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/10020432">https://dwr.state.co.us/Tools/WellPermits/10020432</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
45	WSW	0.48	2,550.03	9,316.53	WATER WELLS

Receipt:	10014694	Parcel Name:	
WD ID:		Parcel Size (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	323296-	City:	SILVERTON
Permit Issued:	08/18/2021	County:	SAN JUAN
Permit Expires:	08/18/2023	State:	CO
Permit Category:	Monitoring/Observation	Postal Code:	81433
Current Status:	Permit Issued	Township:	41.0 N

## Wells and Additional Sources Detail Report

Special Use:	Range: 7.0 W
Associated Uses: Monitoring/Sampling	Section: 17
Permitted Area:	Q160: NE
Permitted Area Units:	Q40: SW
Annual Approp. (AF):	Q10:
Well Depth (Feet):	Coords E/W (Feet):
Top Prf. Casing (ft):	Coords E/W Dir:
Bot Prf. Casing (ft):	Coords N/S (Feet):
Designated Basin:	Coords N/S Dir:
Well Constructed:	UTM x: 265979.0
First Beneficial Use:	UTM y: 4188361.7
Pump Installed:	Location: (37.812686, -107.658491)
Well Plugged:	Location Type: Well (Application/Permit)
Yield (GPM):	Location Accuracy: Spotted from quarters
Static Water Level (ft):	Elevation:
Denver Basin Aquifer: No	Latitude: 37.812686
Static Water Level Date:	Longitude: -107.658491
Modified: 08/18/2021 08:27:00 AM	Management District:
Associated Aquifers: ALLUVIAL	Division: 7
Water District: 30	Principal Meridian: N
Contact Name: SILVERTON TOWN OF	ID Key: 10014694 448872
Counties:	
Well Name:	
Comment:	
Address: 57 CR 33B	
More Information: <a href="https://dwr.state.co.us/Tools/WellPermits/10014694">https://dwr.state.co.us/Tools/WellPermits/10014694</a>	

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
45	WSW	0.48	2,550.03	9,316.53	WATER WELLS

Receipt: 10014693	Parcel Name:
WD ID:	Parcel Size (Acres):
Associated Case No:	Lot:
County Parcel ID:	Block:
Permit: 323294-	City: SILVERTON
Permit Issued: 08/18/2021	County: SAN JUAN
Permit Expires: 08/18/2023	State: CO
Permit Category: Monitoring/Observation	Postal Code: 81433
Current Status: Permit Issued	Township: 41.0 N
Special Use:	Range: 7.0 W
Associated Uses: Monitoring/Sampling	Section: 17
Permitted Area:	Q160: NE
Permitted Area Units:	Q40: SW
Annual Approp. (AF):	Q10:
Well Depth (Feet):	Coords E/W (Feet):
Top Prf. Casing (ft):	Coords E/W Dir:

## Wells and Additional Sources Detail Report

Bot Prf. Csng (ft):	Coords N/S (Feet):
Designated Basin:	Coords N/S Dir:
Well Constructed:	UTM x: 265979.0
Frst Bneficial Use:	UTM y: 4188361.7
Pump Installed:	Location: (37.812686, -107.658491)
Well Plugged:	Location Type: Well (Application/Permit)
Yield (GPM):	Location Accuracy: Spotted from quarters
Statc Wtr Lvl (ft):	Elevation:
Denver Basn Aqufr: No	Latitude: 37.812686
Statc Watr Lvl Dt:	Longitude: -107.658491
Modified: 08/18/2021 08:20:00 AM	Mangemnt District:
Associated Aqufrs: ALLUVIAL	Division: 7
Water District: 30	Principle Meridian: N
Contact Name: SILVERTON TOWN OF	ID Key: 10014693 448872
Counties:	
Well Name:	
Comment:	
Address: 57 CR 33B	
More Information: <a href="https://dwr.state.co.us/Tools/WellPermits/10014693">https://dwr.state.co.us/Tools/WellPermits/10014693</a>	

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
47	ENE	0.51	2,706.97	9,755.14	WATER WELLS

Receipt: 0056196C	Parcel Name:
WD ID:	Prcl Sze (Acres):
Associated Case No:	Lot:
County Parcel ID:	Block:
Permit: 303933-	City:
Permit Issued: 12/15/2016	County: SAN JUAN
Permit Expires:	State:
Permit Category: Monitoring/Observation	Postal Code:
Current Status: Well Constructed	Township: 42.0 N
Special Use:	Range: 6.0 W
Associated Uses: Monitoring/Sampling	Section: 31
Permitted Area:	Q160: NW
Permtted Area Unts:	Q40: NE
Annul Approp. (AF):	Q10:
Well Depth (Feet): 10	Coords E/W (Feet):
Top Prf. Csng (ft):	Coords E/W Dir:
Bot Prf. Csng (ft):	Coords N/S (Feet):
Designated Basin:	Coords N/S Dir:
Well Constructed: 10/11/2016	UTM x: 273657.0
Frst Bneficial Use:	UTM y: 4193262.0
Pump Installed:	Location: (37.858744, -107.572884)
Well Plugged:	Location Type: Well (Application/Permit)
Yield (GPM):	Location Accuracy: User supplied

## Wells and Additional Sources Detail Report

Statc Wtr Lvl (ft):		Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.858744
Statc Watr Lvl Dt:		Longitude:	-107.572884
Modified:	12/15/2016 12:00:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	US BUREAU OF LAND MANAGEMENT	ID Key:	0056196C 78644
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/0056196C">https://dwr.state.co.us/Tools/WellPermits/0056196C</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
48	WSW	0.52	2,739.01	9,357.25	WATER WELLS

Receipt:	9701454	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	249968-	City:	
Permit Issued:	05/06/2003	County:	SAN JUAN
Permit Expires:	05/06/2005	State:	
Permit Category:	Residential	Postal Code:	
Current Status:	Permit Expired	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Domestic	Section:	8
Permitted Area:		Q160:	SW
Permttd Area Unts:		Q40:	SE
Annul Approp. (AF):		Q10:	
Well Depth (Feet):		Coords E/W (Feet):	2850
Top Prf. Csng (ft):		Coords E/W Dir:	E
Bot Prf. Csng (ft):		Coords N/S (Feet):	50
Designated Basin:		Coords N/S Dir:	S
Well Constructed:		UTM x:	265732.4
Frst Bneficial Use:		UTM y:	4188988.3
Pump Installed:		Location:	(37.818261, -107.661497)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	Spotted from section lines
Statc Wtr Lvl (ft):		Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.818261
Statc Watr Lvl Dt:		Longitude:	-107.661497
Modified:	05/02/2003 12:00:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	FIELDS, BETSY	ID Key:	9701454 179694



## Wells and Additional Sources Detail Report

Counties:

Well Name:

Comment:

Address:

More Information: <https://dwr.state.co.us/Tools/WellPermits/9701454>

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
49	ENE	0.54	2,829.33	9,759.60	WATER WELLS

Receipt:	0056196A	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	303936-	City:	
Permit Issued:	12/15/2016	County:	SAN JUAN
Permit Expires:		State:	
Permit Category:	Monitoring/Observation	Postal Code:	
Current Status:	Well Constructed	Township:	42.0 N
Special Use:		Range:	6.0 W
Associated Uses:	Monitoring/Sampling	Section:	31
Permitted Area:		Q160:	NW
Permtted Area Unts:		Q40:	NE
Annul Approp. (AF):		Q10:	
Well Depth (Feet):	13	Coords E/W (Feet):	
Top Prf. Csng (ft):		Coords E/W Dir:	
Bot Prf. Csng (ft):		Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:	10/11/2016	UTM x:	273721.0
Frst Bneficial Use:		UTM y:	4193188.0
Pump Installed:		Location:	(37.858094, -107.572134)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	User supplied
Statc Wtr Lvl (ft):		Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.858094
Statc Watr Lvl Dt:		Longitude:	-107.572134
Modified:	12/15/2016 12:00:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	US BUREAU OF LAND MANAGEMENT	ID Key:	0056196A 78644

Counties:

Well Name:

Comment:

Address:

More Information: <https://dwr.state.co.us/Tools/WellPermits/0056196A>

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
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## Wells and Additional Sources Detail Report

50	NE	0.54	2,842.19	9,746.17	WATER WELLS
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Receipt:	0056009	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	56009-MH	City:	
Permit Issued:	10/04/2016	County:	SAN JUAN
Permit Expires:	01/02/2017	State:	
Permit Category:	Monitoring Hole (Notice of Intent)	Postal Code:	
Current Status:	Permit Issued	Township:	42.0 N
Special Use:		Range:	6.0 W
Associated Uses:	Monitoring/Sampling	Section:	31
Permitted Area:		Q160:	NW
Permttd Area Unts:		Q40:	NW
Annul Approp. (AF):		Q10:	
Well Depth (Feet):		Coords E/W (Feet):	
Top Prf. Csng (ft):		Coords E/W Dir:	
Bot Prf. Csng (ft):		Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:		UTM x:	273386.9
Frst Bneficial Use:		UTM y:	4193365.7
Pump Installed:		Location:	(37.85961, -107.575984)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	Spotted from quarters
Statc Wtr Lvl (ft):		Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.859610
Statc Watr Lvl Dt:		Longitude:	-107.575984
Modified:	12/14/2016 12:00:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	US BUREAU OF LAND MANAGEMENT	ID Key:	0056009 298953
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/0056009">https://dwr.state.co.us/Tools/WellPermits/0056009</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
52	ENE	0.54	2,863.06	9,968.03	WATER WELLS

Receipt:	9701655	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	256546-	City:	

## Wells and Additional Sources Detail Report

Permit Issued:	04/20/2004	County:	SAN JUAN
Permit Expires:	04/20/2006	State:	
Permit Category:	Residential	Postal Code:	
Current Status:	Well Constructed	Township:	42.0 N
Special Use:		Range:	6.0 W
Associated Uses:	Domestic	Section:	31
Permitted Area:		Q160:	NW
Permitted Area Units:		Q40:	SE
Annul Approp. (AF):		Q10:	
Well Depth (Feet):	282	Coords E/W (Feet):	
Top Prf. Csng (ft):	202	Coords E/W Dir:	
Bot Prf. Csng (ft):	282	Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:	06/06/2004	UTM x:	273916.5
First Beneficial Use:		UTM y:	4193113.6
Pump Installed:	06/06/2004	Location:	(37.857476, -107.569896)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):	6.00	Location Accuracy:	User supplied
Static Wtr Lvl (ft):	125.00	Elevation:	
Denver Basin Aquifer:	No	Latitude:	37.857476
Static Wtr Lvl Dt:	2004/06/06	Longitude:	-107.569896
Modified:	08/11/2004 12:00:00 AM	Management District:	
Associated Aquifers:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	WERNER, KIMBERLY	ID Key:	9701655 30603
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/9701655">https://dwr.state.co.us/Tools/WellPermits/9701655</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
53	ENE	0.56	2,937.45	9,753.55	WATER WELLS

Receipt:	0056196B	Parcel Name:	
WD ID:		Parcel Size (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	303935-	City:	
Permit Issued:	12/15/2016	County:	SAN JUAN
Permit Expires:		State:	
Permit Category:	Monitoring/Observation	Postal Code:	
Current Status:	Well Constructed	Township:	42.0 N
Special Use:		Range:	6.0 W
Associated Uses:	Monitoring/Sampling	Section:	31
Permitted Area:		Q160:	NW

## Wells and Additional Sources Detail Report

Permitted Area Units:	Q40:	NE
Annul Approp. (AF):	Q10:	
Well Depth (Feet): 15	Coords E/W (Feet):	
Top Prf. Csng (ft):	Coords E/W Dir:	
Bot Prf. Csng (ft):	Coords N/S (Feet):	
Designated Basin:	Coords N/S Dir:	
Well Constructed: 10/11/2016	UTM x:	273620.0
Frst Bneficial Use:	UTM y:	4193202.0
Pump Installed:	Location:	(37.858195, -107.573286)
Well Plugged:	Location Type:	Well (Application/Permit)
Yield (GPM):	Location Accuracy:	User supplied
Statc Wtr Lvl (ft):	Elevation:	
Denver Basn Aqufr: No	Latitude:	37.858195
Statc Watr Lvl Dt:	Longitude:	-107.573286
Modified: 12/15/2016 12:00:00 AM	Mangemnt District:	
Associated Aqufrs: ALL UNNAMED AQUIFERS	Division:	7
Water District: 30	Principle Meridian:	N
Contact Name: US BUREAU OF LAND MANAGEMENT	ID Key:	0056196B 78644

Counties:

Well Name:

Comment:

Address:

More Information: <https://dwr.state.co.us/Tools/WellPermits/0056196B>

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
54	ENE	0.56	2,958.93	10,237.26	WATER WELLS

Receipt: 3615082	Parcel Name:
WD ID:	Prcl Sze (Acres):
Associated Case No:	Lot:
County Parcel ID:	Block:
Permit: 273248-	City:
Permit Issued: 04/06/2007	County: SAN JUAN
Permit Expires: 04/06/2009	State:
Permit Category: Residential	Postal Code:
Current Status: Permit Issued	Township: 42.0 N
Special Use:	Range: 6.0 W
Associated Uses: Domestic	Section: 31
Permitted Area:	Q160: NE
Permtted Area Units:	Q40: SW
Annul Approp. (AF):	Q10:
Well Depth (Feet):	Coords E/W (Feet): 2195
Top Prf. Csng (ft):	Coords E/W Dir: E
Bot Prf. Csng (ft):	Coords N/S (Feet): 1575
Designated Basin:	Coords N/S Dir: N
Well Constructed:	UTM x: 274112.1

## Wells and Additional Sources Detail Report

First Beneficial Use:	UTM y:	4193068.7
Pump Installed:	Location:	(37.857119, -107.567657)
Well Plugged:	Location Type:	Well (Application/Permit)
Yield (GPM):	Location Accuracy:	Spotted from section lines
Static Water Level (ft):	Elevation:	
Denver Basin Aquifer: No	Latitude:	37.857119
Static Water Level Date:	Longitude:	-107.567657
Modified: 04/05/2007 12:00:00 AM	Management District:	
Associated Aquifers: ALL UNNAMED AQUIFERS	Division:	7
Water District: 30	Principal Meridian:	N
Contact Name: LAPPIN, STEVE	ID Key:	3615082 235506
Counties:		
Well Name:		
Comment:		
Address:		
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/3615082">https://dwr.state.co.us/Tools/WellPermits/3615082</a>	

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
55	S	0.57	2,987.50	10,550.70	WATER WELLS

Receipt: 0540814	Parcel Name: BIG BULL LODGE MS 18708
WD ID:	Parcel Size (Acres):
Associated Case No:	Lot:
County Parcel ID:	Block:
Permit: 264283-	City:
Permit Issued: 07/11/2005	County: SAN JUAN
Permit Expires: 07/11/2007	State:
Permit Category: Residential	Postal Code:
Current Status: Permit Issued	Township: 41.0 N
Special Use:	Range: 7.0 W
Associated Uses: Domestic	Section: 15
Permitted Area:	Q160: NW
Permitted Area Units:	Q40: NW
Annual Approp. (AF):	Q10:
Well Depth (Feet):	Coords E/W (Feet): 595
Top Prof. Casing (ft):	Coords E/W Dir: W
Bottom Prof. Casing (ft):	Coords N/S (Feet): 765
Designated Basin:	Coords N/S Dir: N
Well Constructed:	UTM x: 268387.1
First Beneficial Use:	UTM y: 4188655.6
Pump Installed:	Location: (37.81595, -107.631257)
Well Plugged:	Location Type: Well (Application/Permit)
Yield (GPM):	Location Accuracy: Spotted from section lines
Static Water Level (ft):	Elevation:
Denver Basin Aquifer: No	Latitude: 37.815950
Static Water Level Date:	Longitude: -107.631257



## Wells and Additional Sources Detail Report

Modified:	07/11/2005 12:00:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	MARSH, GEORGE	ID Key:	0540814 57914
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/0540814">https://dwr.state.co.us/Tools/WellPermits/0540814</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
57	SSW	0.64	3,393.28	10,710.00	WATER WELLS

Receipt:	0546567	Parcel Name:	PANIC LODE MS 13322A
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:		City:	
Permit Issued:		County:	SAN JUAN
Permit Expires:		State:	
Permit Category:	Unknown	Postal Code:	
Current Status:	Application Received	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Domestic	Section:	16
Permitted Area:		Q160:	NE
Permtted Area Unts:		Q40:	SE
Annul Approp. (AF):		Q10:	
Well Depth (Feet):		Coords E/W (Feet):	280
Top Prf. Csng (ft):		Coords E/W Dir:	E
Bot Prf. Csng (ft):		Coords N/S (Feet):	1836
Designated Basin:		Coords N/S Dir:	N
Well Constructed:		UTM x:	268113.2
Frst Bneficial Use:		UTM y:	4188338.0
Pump Installed:		Location:	(37.813017, -107.634265)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	Spotted from section lines
Statc Wtr Lvl (ft):		Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.813017
Statc Watr Lvl Dt:		Longitude:	-107.634265
Modified:	12/09/2005 12:00:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	MACKIE, MARK	ID Key:	0546567 188540
Counties:			
Well Name:			
Comment:			

## Wells and Additional Sources Detail Report

Address:

More Information: <https://dwr.state.co.us/Tools/WellPermits/0546567>

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
58	ENE	0.64	3,399.17	9,743.38	WATER WELLS

Receipt:	0357659	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	42698-F	City:	
Permit Issued:	08/30/1993	County:	SAN JUAN
Permit Expires:	08/30/1994	State:	
Permit Category:	General Purpose	Postal Code:	
Current Status:	Well Constructed	Township:	42.0 N
Special Use:		Range:	6.0 W
Associated Uses:	Commercial, Domestic	Section:	31
Permitted Area:		Q160:	NW
Permitted Area Unts:		Q40:	SW
Annul Approp. (AF):		Q10:	
Well Depth (Feet):	70	Coords E/W (Feet):	1000
Top Prf. Csng (ft):	50	Coords E/W Dir:	W
Bot Prf. Csng (ft):	70	Coords N/S (Feet):	1500
Designated Basin:		Coords N/S Dir:	N
Well Constructed:	08/15/1994	UTM x:	273489.4
Frst Bneficial Use:		UTM y:	4193110.7
Pump Installed:		Location:	(37.857343, -107.574745)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	Spotted from section lines
Statc Wtr Lvl (ft):	4.00	Elevation:	9800
Denver Basn Aqufr:	No	Latitude:	37.857343
Statc Watr Lvl Dt:	1994/08/15	Longitude:	-107.574745
Modified:	11/03/1994 12:00:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	PADRICK, KEVIN D	ID Key:	0357659 330477
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/0357659">https://dwr.state.co.us/Tools/WellPermits/0357659</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
61	SW	0.65	3,458.30	9,303.74	WATER WELLS

Receipt:	0062682	Parcel Name:	
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## Wells and Additional Sources Detail Report

WD ID:	Prcl Size (Acres):
Associated Case No:	Lot:
County Parcel ID:	Block:
Permit: 62682-MH	City: SILVERTON
Permit Issued: 12/08/2021	County: SAN JUAN
Permit Expires: 03/08/2022	State: CO
Permit Category: Monitoring Hole (Notice of Intent)	Postal Code: 81433
Current Status: Permit Issued	Township: 41.0 N
Special Use:	Range: 7.0 W
Associated Uses: Monitoring/Sampling	Section: 17
Permitted Area:	Q160:
Permitted Area Unts:	Q40:
Annul Approp. (AF):	Q10:
Well Depth (Feet):	Coords E/W (Feet):
Top Prf. Csng (ft):	Coords E/W Dir:
Bot Prf. Csng (ft):	Coords N/S (Feet):
Designated Basin:	Coords N/S Dir:
Well Constructed:	UTM x: 265781.5
Frst Bneficial Use:	UTM y: 4188167.3
Pump Installed:	Location: (37.810885, -107.660669)
Well Plugged:	Location Type: Well (Application/Permit)
Yield (GPM):	Location Accuracy: Spotted from quarters
Statc Wtr Lvl (ft):	Elevation:
Denver Basn Aqufr: No	Latitude: 37.810885
Statc Wtr Lvl Dt:	Longitude: -107.660669
Modified: 01/06/2022 03:04:00 PM	Mangemnt District:
Associated Aqufrs: ALLUVIAL	Division: 7
Water District: 30	Principle Meridian: N
Contact Name: STEVENS, HEIDI	ID Key: 0062682 455398
Counties:	
Well Name:	
Comment:	
Address: 2100 KENDALL ST 1401 MINERAL ST	
More Information: <a href="https://dwr.state.co.us/Tools/WellPermits/0062682">https://dwr.state.co.us/Tools/WellPermits/0062682</a>	

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
62	ENE	0.66	3,502.82	9,819.01	WATER WELLS

Receipt: 0056007	Parcel Name:
WD ID:	Prcl Size (Acres):
Associated Case No:	Lot:
County Parcel ID:	Block:
Permit: 56007-MH	City:
Permit Issued: 10/04/2016	County: SAN JUAN
Permit Expires: 01/02/2017	State:
Permit Category: Monitoring Hole (Notice of Intent)	Postal Code:

## Wells and Additional Sources Detail Report

Current Status:	Permit Issued	Township:	42.0 N
Special Use:		Range:	6.0 W
Associated Uses:	Monitoring/Sampling	Section:	31
Permitted Area:		Q160:	NW
Permitted Area Unts:		Q40:	SE
Annul Approp. (AF):		Q10:	
Well Depth (Feet):		Coords E/W (Feet):	
Top Prf. Csng (ft):		Coords E/W Dir:	
Bot Prf. Csng (ft):		Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:		UTM x:	273771.6
Frst Bneficial Use:		UTM y:	4192949.4
Pump Installed:		Location:	(37.855958, -107.571485)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	Spotted from quarters
Statc Wtr Lvl (ft):		Elevation:	
Denver Basn Aquifr:	No	Latitude:	37.855958
Statc Watr Lvl Dt:		Longitude:	-107.571485
Modified:	12/14/2016 12:00:00 AM	Managemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	US BUREAU OF LAND MANAGEMENT	ID Key:	0056007 298953
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/0056007">https://dwr.state.co.us/Tools/WellPermits/0056007</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
65	N	0.69	3,638.35	11,294.82	WATER WELLS

Receipt:	3668288	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:	06CW115, 15CW3002	Lot:	
County Parcel ID:		Block:	
Permit:	78906-F	City:	
Permit Issued:	03/19/2015	County:	SAN JUAN
Permit Expires:	03/19/2016	State:	
Permit Category:	General Purpose	Postal Code:	
Current Status:	Permit Issued	Township:	42.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Commercial	Section:	21
Permitted Area:		Q160:	NW
Permitted Area Unts:		Q40:	NE
Annul Approp. (AF):		Q10:	
Well Depth (Feet):		Coords E/W (Feet):	

## Wells and Additional Sources Detail Report

Top Prf. Csng (ft):	Coords E/W Dir:
Bot Prf. Csng (ft):	Coords N/S (Feet):
Designated Basin:	Coords N/S Dir:
Well Constructed:	UTM x: 267537.0
Frst Bneficial Use:	UTM y: 4196855.0
Pump Installed:	Location: (37.889554, -107.64354)
Well Plugged:	Location Type: Well (Application/Permit)
Yield (GPM):	Location Accuracy: User supplied
Statc Wtr Lvl (ft):	Elevation:
Denver Basn Aquifr: No	Latitude: 37.889554
Statc Wtr Lvl Dt:	Longitude: -107.643540
Modified: 03/19/2015 12:00:00 AM	Mangemnt District:
Associated Aqufrs: ALL UNNAMED AQUIFERS	Division: 7
Water District: 30	Principle Meridian: N
Contact Name: HIGH MOUNTAIN PROPERTIES LLC	ID Key: 3668288 282474
Counties:	
Well Name:	
Comment:	
Address:	
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/3668288">https://dwr.state.co.us/Tools/WellPermits/3668288</a>

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
69	ENE	0.76	4,013.88	9,731.14	WATER WELLS

Receipt: 0056008	Parcel Name:
WD ID:	Prcl Sze (Acres):
Associated Case No:	Lot:
County Parcel ID:	Block:
Permit: 56008-MH	City:
Permit Issued: 10/04/2016	County: SAN JUAN
Permit Expires: 01/02/2017	State:
Permit Category: Monitoring Hole (Notice of Intent)	Postal Code:
Current Status: Permit Issued	Township: 42.0 N
Special Use:	Range: 6.0 W
Associated Uses: Monitoring/Sampling	Section: 31
Permitted Area:	Q160: NW
Permtted Area Unts:	Q40: SW
Annul Approp. (AF):	Q10:
Well Depth (Feet):	Coords E/W (Feet):
Top Prf. Csng (ft):	Coords E/W Dir:
Bot Prf. Csng (ft):	Coords N/S (Feet):
Designated Basin:	Coords N/S Dir:
Well Constructed:	UTM x: 273374.5
Frst Bneficial Use:	UTM y: 4192959.1
Pump Installed:	Location: (37.855947, -107.575997)
Well Plugged:	Location Type: Well (Application/Permit)



## Wells and Additional Sources Detail Report

Yield (GPM):		Location Accuracy:	Spotted from quarters
Statc Wtr Lvl (ft):		Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.855947
Statc Wtr Lvl Dt:		Longitude:	-107.575997
Modified:	12/14/2016 12:00:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	US BUREAU OF LAND MANAGEMENT	ID Key:	0056008 298953
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/0056008">https://dwr.state.co.us/Tools/WellPermits/0056008</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
70	ENE	0.76	4,034.67	9,942.44	WATER WELLS

Receipt:	9701902	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:		City:	
Permit Issued:		County:	SAN JUAN
Permit Expires:		State:	
Permit Category:	Unknown	Postal Code:	
Current Status:	Application Withdrawn	Township:	42.0 N
Special Use:		Range:	6.0 W
Associated Uses:	Household use only	Section:	31
Permitted Area:		Q160:	NE
Permtted Area Unts:		Q40:	SW
Annul Approp. (AF):		Q10:	
Well Depth (Feet):		Coords E/W (Feet):	
Top Prf. Csng (ft):		Coords E/W Dir:	
Bot Prf. Csng (ft):		Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:		UTM x:	273970.0
Frst Bneficial Use:		UTM y:	4192745.9
Pump Installed:		Location:	(37.854175, -107.569168)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	Spotted from quarters
Statc Wtr Lvl (ft):		Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.854175
Statc Wtr Lvl Dt:		Longitude:	-107.569168
Modified:	06/30/2005 12:00:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N

## Wells and Additional Sources Detail Report

Contact Name: SPEED DON AND DAVID AND WILMA ID Key: 9701902 9358  
 Counties:  
 Well Name:  
 Comment:  
 Address:  
 More Information: <https://dwr.state.co.us/Tools/WellPermits/9701902>

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
71	E	0.82	4,348.01	10,110.81	WATER WELLS

Receipt:	9124722	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	101895-	City:	
Permit Issued:	09/13/1980	County:	SAN JUAN
Permit Expires:		State:	
Permit Category:	Residential	Postal Code:	
Current Status:	Well Constructed	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Domestic	Section:	11
Permitted Area:		Q160:	NW
Permitted Area Unts:		Q40:	NW
Annul Approp. (AF):		Q10:	
Well Depth (Feet):	10	Coords E/W (Feet):	330
Top Prf. Csng (ft):		Coords E/W Dir:	W
Bot Prf. Csng (ft):		Coords N/S (Feet):	660
Designated Basin:		Coords N/S Dir:	N
Well Constructed:	09/30/1978	UTM x:	269985.6
Frst Bneficial Use:	09/30/1978	UTM y:	4190251.7
Pump Installed:	09/30/1978	Location:	(37.830724, -107.613616)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):	15.00	Location Accuracy:	Spotted from section lines
Statc Wtr Lvl (ft):		Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.830724
Statc Watr Lvl Dt:		Longitude:	-107.613616
Modified:	08/29/1990 12:00:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	BRIDGEWATER F L	ID Key:	9124722 201875
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/9124722">https://dwr.state.co.us/Tools/WellPermits/9124722</a>		

## Wells and Additional Sources Detail Report

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
75	WSW	0.87	4,571.74	9,315.95	WATER WELLS

Receipt:	3646427	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	
County Parcel ID:		Block:	
Permit:	531-G	City:	
Permit Issued:	09/07/2010	County:	SAN JUAN
Permit Expires:	09/07/2011	State:	
Permit Category:	General Purpose	Postal Code:	
Current Status:	Permit Issued	Township:	41.0 N
Special Use:		Range:	7.0 W
Associated Uses:	Geothermal	Section:	17
Permitted Area:		Q160:	NW
Permitted Area Unts:		Q40:	SW
Annul Approp. (AF):		Q10:	
Well Depth (Feet):		Coords E/W (Feet):	
Top Prf. Csng (ft):		Coords E/W Dir:	
Bot Prf. Csng (ft):		Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:		UTM x:	265296.0
Frst Bneficial Use:		UTM y:	4188291.0
Pump Installed:		Location:	(37.811874, -107.666219)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):		Location Accuracy:	User supplied
Statc Wtr Lvl (ft):		Elevation:	
Denver Basn Aqufr:	No	Latitude:	37.811874
Statc Watr Lvl Dt:		Longitude:	-107.666219
Modified:	07/15/2010 12:00:00 AM	Mangemnt District:	
Associated Aqufrs:	ALL UNNAMED AQUIFERS	Division:	7
Water District:	30	Principle Meridian:	N
Contact Name:	SAN JUAN SCHOOL DISTRICT #1	ID Key:	3646427 141007
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/3646427">https://dwr.state.co.us/Tools/WellPermits/3646427</a>		

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
76	WSW	0.88	4,650.74	9,315.04	WATER WELLS

Receipt:	3646428	Parcel Name:	
WD ID:		Prcl Sze (Acres):	
Associated Case No:		Lot:	

## Wells and Additional Sources Detail Report

County Parcel ID:	Block:
Permit: 532-G	City:
Permit Issued: 09/07/2010	County: SAN JUAN
Permit Expires: 09/07/2011	State:
Permit Category: General Purpose	Postal Code:
Current Status: Permit Issued	Township: 41.0 N
Special Use:	Range: 7.0 W
Associated Uses: Geothermal	Section: 17
Permitted Area:	Q160: NW
Permitted Area Unts:	Q40: SW
Annul Approp. (AF):	Q10:
Well Depth (Feet):	Coords E/W (Feet):
Top Prf. Csng (ft):	Coords E/W Dir:
Bot Prf. Csng (ft):	Coords N/S (Feet):
Designated Basin:	Coords N/S Dir:
Well Constructed:	UTM x: 265276.0
Frst Bneficial Use:	UTM y: 4188277.0
Pump Installed:	Location: (37.811743, -107.666442)
Well Plugged:	Location Type: Well (Application/Permit)
Yield (GPM):	Location Accuracy: User supplied
Statc Wtr Lvl (ft):	Elevation:
Denver Basn Aqufr: No	Latitude: 37.811743
Statc Wtr Lvl Dt:	Longitude: -107.666442
Modified: 09/07/2010 12:00:00 AM	Mangemnt District:
Associated Aqufrs: ALL UNNAMED AQUIFERS	Division: 7
Water District: 30	Principle Meridian: N
Contact Name: SAN JUAN SCHOOL DISTRICT #1	ID Key: 3646428 141007
Counties:	
Well Name:	
Comment:	
Address:	
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/3646428">https://dwr.state.co.us/Tools/WellPermits/3646428</a>

Map Key	Direction	Distance (mi)	Distance (ft)	Elevation (ft)	DB
79	ENE	0.94	4,936.81	9,728.72	WATER WELLS

Receipt: 0543225	Parcel Name:
WD ID: 3005298	Prcl Sze (Acres):
Associated Case No:	Lot:
County Parcel ID:	Block:
Permit: 63417-F	City:
Permit Issued: 10/13/2005	County: SAN JUAN
Permit Expires: 10/13/2006	State:
Permit Category: Gravel Pit	Postal Code:
Current Status: Well Constructed	Township: 42.0 N
Special Use:	Range: 6.0 W

## Wells and Additional Sources Detail Report

Associated Uses:	Other	Section:	31
Permitted Area:		Q160:	SW
Permitted Area Units:		Q40:	NW
Annul Approp. (AF):		Q10:	
Well Depth (Feet):	12	Coords E/W (Feet):	
Top Prf. Csng (ft):		Coords E/W Dir:	
Bot Prf. Csng (ft):		Coords N/S (Feet):	
Designated Basin:		Coords N/S Dir:	
Well Constructed:	06/01/2006	UTM x:	273361.0
First Beneficial Use:		UTM y:	4192650.0
Pump Installed:	06/15/2006	Location:	(37.85316, -107.576054)
Well Plugged:		Location Type:	Well (Application/Permit)
Yield (GPM):	15.00	Location Accuracy:	User supplied
Static Water Level (ft):	6.00	Elevation:	
Denver Basin Aquifer:	No	Latitude:	37.853160
Static Water Level Date:	2006/06/01	Longitude:	-107.576054
Modified:	02/24/2011 12:00:00 AM	Management District:	
Associated Aquifers:	QUATERNARY ALLUVIUM	Division:	7
Water District:	30	Principal Meridian:	N
Contact Name:	CLARK JACK JR & BARBARA	ID Key:	0543225 221325
Counties:			
Well Name:			
Comment:			
Address:			
More Information:	<a href="https://dwr.state.co.us/Tools/WellPermits/0543225">https://dwr.state.co.us/Tools/WellPermits/0543225</a>		



## Radon Information

This section lists any relevant radon information found for the target property.

Federal EPA Radon Zone for *OURAY* County: **1**

Federal EPA Radon Zone for *SAN JUAN* County: **2**

*Zone 1: Counties with predicted average indoor radon screening levels greater than 4 pCi/L*

*Zone 2: Counties with predicted average indoor radon screening levels from 2 to 4 pCi/L*

*Zone 3: Counties with predicted average indoor radon screening levels less than 2 pCi/L*

---

### Federal Area Radon Information for *OURAY* County

No Measures/Homes:	2
Geometric Mean:	2
Arithmetic Mean:	2.8
Median:	2.8
Standard Deviation:	2.8
Maximum:	4.8
% >4 pCi/L:	50
% >20 pCi/L:	0
Notes on Data Table:	TABLE 1. Screening indoor radon data from the EPA/State Residential Radon Survey of Colorado conducted during 1986-87. Data represent 2-7 day charcoal canister measurements from the lowest level of each home tested.

## Federal Sources

### FEMA National Flood Hazard Layer

FEMA FLOOD

The National Flood Hazard Layer (NFHL) data incorporates Flood Insurance Rate Map (FIRM) databases published by the Federal Emergency Management Agency (FEMA), and any Letters Of Map Revision (LOMRs) that have been issued against those databases since their publication date. The FIRM Database is the digital, geospatial version of the flood hazard information shown on the published paper FIRMs. The FIRM Database depicts flood risk information and supporting data used to develop the risk data. The FIRM Database is derived from Flood Insurance Studies (FISs), previously published FIRMs, flood hazard analyses performed in support of the FISs and FIRMs, and new mapping data, where available.

### Indoor Radon Data

INDOOR RADON

Indoor radon measurements tracked by the Environmental Protection Agency(EPA) and the State Residential Radon Survey.

### Public Water Systems Violations and Enforcement Data

PWSV

List of drinking water violations and enforcement actions from the Safe Drinking Water Information System (SDWIS) made available by the Drinking Water Protection Division of the US EPA's Office of Groundwater and Drinking Water. Enforcement sensitive actions are not included in the data released by the EPA. Address information provided in SWDIS may correspond either with the physical location of the water system, or with a contact address.

### Radon Zone Level

RADON ZONE

Areas showing the level of Radon Zones (level 1, 2 or 3) by county. This data is maintained by the Environmental Protection Agency (EPA).

### Safe Drinking Water Information System (SDWIS)

SDWIS

The Safe Drinking Water Information System (SDWIS) contains information about public water systems as reported to US Environmental Protection Agency (EPA) by the states. Addresses may correspond with the location of the water system, or with a contact address.

### Soil Survey Geographic database

SSURGO

The Soil Survey Geographic database (SSURGO) contains information about soil as collected by the National Cooperative Soil Survey at the Natural Resources Conservation Service (NRCS). Soil maps outline areas called map units. The map units are linked to soil properties in a database. Each map unit may contain one to three major components and some minor components.

### U.S. Fish & Wildlife Service Wetland Data

US WETLAND

The U.S. Fish & Wildlife Service Wetland layer represents the approximate location and type of wetlands and deepwater habitats in the United States.

### USGS Current Topo

US TOPO

US Topo topographic maps are produced by the National Geospatial Program of the U.S. Geological Survey (USGS). The project was launched in late 2009, and the term "US Topo" refers specifically to quadrangle topographic maps published in 2009 and later.

### USGS Geology

US GEOLOGY

Seamless maps depicting geological information provided by the United States Geological Survey (USGS).

### USGS National Water Information System

FED USGS

The U.S. Geological Survey (USGS)'s National Water Information System (NWIS) is the nation's principal repository of water resources data. This database includes comprehensive information of well-construction details, time-series data for gage height, streamflow, groundwater level, and precipitation and water use data.

### Wells from NWIS

FED USGS

The U.S. Geological Survey's National Water Information System (NWIS) is the nation's principal repository of water resources data. The NWIS includes comprehensive information of well-construction details, time-series data for gage height, streamflow, groundwater level, and precipitation and water use data. This NWIS dataset contains select Site Types from the overall NWIS Sites data, limited to the following Group Site Types only: Groundwater Group Site Types: Well, Collector or Ranney type well, Hyporheic-zone well,

## Appendix

Interconnected Wells, Multiple wells; Spring Group Site Type: Spring; and Other Group Site Types: Aggregate groundwater use, Cistern.

### **State Sources**

#### **Oil and Gas Pit Locations**

**PITS**

The Colorado Oil and Gas Conservation Commission (COGCC) maintains this list of oil and gas pit locations within Colorado. This data contains over 10,000 oil and gas related pit locations. The Colorado Department of Natural Resources (DNR) notes that data and information provided by the DNR is provided as is without warranty of any kind, and that DNR is not responsible and shall not be liable for damages of any kind arising out of the use of data or information provided herein.

#### **Oil and Gas Wells**

**OGW**

A list of active and plugged wells - including active and expired well permits provided by Department of Natural Resources, Oil & Gas Conservation Commission.

#### **Public Water Wells**

**WATER WELLS**

The statewide water wells data consists of water levels information for each well. The data was made available by Colorado Decision Supports System under the development and improvement by the Colorado Water Conservation Board (CWCB) and the Colorado Division of Water Resources (DWR). The well latitude and longitude information represents physical location of the wells.

#### **Water Wells Permit Database**

**WATER WELLS**

Water wells application and permit database maintained by the Colorado Department of Natural Resources' Division of Water Resources. This database includes statewide well applications and permits issued by the department.

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## Appendix F

### User Questionnaire



## ASTME2247-16 USER QUESTIONNAIRE

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In order to qualify for one of the Landowner Liability Protections (LLPs) offered by the Small Business Relief and Brownfields Revitalization Act of 2001, the user must respond to the following questions. Failure to provide this information to the environmental professional may result in significant data gaps, which may limit our ability to identify recognized environmental conditions resulting in a determination that "all appropriate inquiry" is not complete. This form represents a type of interview and as such, the user has an obligation to answer all questions in good faith, to the extent of their actual knowledge.

Site Name: Sunnyside Gold Corporation Mining Claims

Site Address: San Juan County

1) Are you aware of any environmental cleanup liens against the property that are filed or recorded under federal, tribal, state, or local law (40 CFR 312.25)?    No X Yes If yes, please explain.

The area reviewed is included in a CERCLA designated site on the National Priority Listing. In addition, San Juan County is aware the property is subject to environmental covenants. In regards to local law, the property is subject to the institutional controls.

2) Are you aware of any activity and use limitations (AULs), such as engineering controls, land use restrictions, or institutional controls that are in place at the property and/or have been filed or recorded in a registry under federal, tribal, state, or local law (40 CFR 312.26)?    No X Yes If yes, please explain.

San Juan County is aware of use limitations set forth in the institutional controls, land use restrictions and covenants required for property within designated Superfund Sites.

3) As the user of this ESA, do you have any specialized knowledge or experience related to the property or nearby properties? For example, are you involved in the same line of business as the current or former occupants of the property or an adjoining property so that you would have specialized knowledge of the chemicals and processes used by this type of business (40 CFR 312.28)? X No    Yes If yes, please explain.

4) Does the purchase price being paid for this property reasonably reflect the fair market value of the property (40 CFR 312.29)? X No    Yes

If no, have you considered whether the lower purchase price is because contamination is known or believed to be present at the property (40 CFR 312.29)?    No    Yes If yes, please explain.

5) Are you aware of commonly known or reasonably ascertainable information about the property that would help the environmental professional to identify conditions indicative of releases or threatened releases (40 CFR 312.30)?    No X Yes If yes, please explain.

San Juan County is aware of the documentation, research and sampling the Animas River Stakeholders, the State of Colorado, USGS, the Owner and EPA have gathered and/or prepared over the decades.

6) As the user of this ESA, based on your knowledge and experience related to the property, are there any obvious indicators that point to the presence or likely presence of contamination at the property (40 CFR 312.31)?    No X Yes If yes, please explain.

Yes, some areas within the property boundaries include the remnants of historic mining activity. In regards to the tailings ponds (1-4) those areas contain waste rock and other contamination based on historic activity.

ASTM E2247-16 USER QUESTIONNAIRE  
Page 2 of 3

**Request for Information and Documentation**

In addition to the specific questions above, the user is requested to provide the following information and documentation, as available. ASTM requires that this information, if available, be provided to the environmental professional prior to the property visit.

Included "X"	Not Available or Not Known "X"	Requested Information	Contact Information
X		Point of Contact (Access) Dennis McHarness Ryan Bensing	Name/Phone Dennis McHarness 1 (775) 200-4811 Ryan Bensing
X		Current Site Owner Sunnyside Gold Corporation	Name/Phone: Dennis McHarness 1 (775) 200-4811 Ryan Bensing
X		Current Facility Operator Sunnyside Gold Corporation	Name/Phone Dennis McHarness 1 (775) 200-4811 Ryan Bensing
	X	Prior Owners	Name/Phone
	X	Prior Occupants	Name/Phone
	X	Access Restrictions	Comments -
	X	Special Requirements/Confidentiality	Comments -
	X	Site Diagram or Legal Description	Attach -
	X	Chain of Title (back to 1940 or first developed use)	Attach -
X		Reason for conducting Phase I ESA	Comments - The purpose for conducting a Phase I ESA is to qualify San Juan County as a BFPP under CERCLA prior to the the property transfer. SJC has commissioned this process in order to comply with the performance of "all appropriate inquiries" (AAI) before acquiring the property.

### Helpful Documents Checklist

Per ASTM E1527-13/E1537-21 Section 10.8, do you know if any of the following documents exist for this property and if so, are copies of the documents available for review by the environmental professional? Check all that apply.

- |  |   |
|--|---|
| <input checked="" type="checkbox"/> Environmental property assessment reports                                      | <input type="checkbox"/> Environmental compliance audit reports                               |
| <input checked="" type="checkbox"/> Geotechnical reports   | <input type="checkbox"/> Registrations for aboveground or underground tanks                   |
| <input type="checkbox"/> Environmental property permits<br>(e.g., solid waste or hazardous waste disposal permits) | <input type="checkbox"/> Registrations for underground injection systems                      |
| <input type="checkbox"/> Hazardous waste manifests   | <input checked="" type="checkbox"/> Recorded environmental covenants or land use restrictions |

Anthony D. Edwards

---

Name (Authorized Client Representative)

San Juan County, BPMD Communications Liaison

---

Title

s/ Anthony D. Edwards

---

Signature

October 17, 2022

---

Date

# Appendix G

## Database Report



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# DATABASE REPORT

<b>Project Property:</b>	<i>San Juan County Mining Parcels Phase I ESA San Juan County Silverton CO</i>
<b>Project No:</b>	<i>900.B11</i>
<b>Report Type:</b>	<i>Database Report</i>
<b>Order No:</b>	<i>22100605183</i>
<b>Requested by:</b>	<i>Iron Woman Construction and Environmental Services LLC</i>
<b>Date Completed:</b>	<i>October 12, 2022</i>

## Environmental Risk Information Services

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# Executive Summary

## Property Information:

**Project Property:** *San Juan County Mining Parcels Phase I ESA  
San Juan County Silverton CO*

**Project No:** *900.B11*

### **Coordinates:**

**Latitude:** *37.88390697*  
**Longitude:** *-107.60897426*  
**UTM Northing:** *4,190,055.20*  
**UTM Easting:** *268,560.61*  
**UTM Zone:** *UTM Zone 13S*

**Elevation:** *12,124 FT*

## Order Information:

**Order No:** *22100605183*  
**Date Requested:** *October 6, 2022*  
**Requested by:** *Iron Woman Construction and Environmental Services LLC*  
**Report Type:** *Database Report*

## Historicals/Products:

<b>Aerial Photographs</b>	<i>GIS Ready Aerials</i>
<b>ERIS Xplorer</b>	<a href="#"><i>ERIS Xplorer</i></a>
<b>Excel Add-On</b>	<i>Excel Add-On</i>
<b>KML File</b>	<i>Project Boundary file (KML File format)</i>
<b>Physical Setting Report (PSR)</b>	<i>Physical Setting Report (PSR)</i>
<b>Topographic Map</b>	<i>Topographic Maps</i>

## Executive Summary: Report Summary

Database	Searched	Search Radius	Project Property	Within 0.12mi	0.125mi to 0.25mi	0.25mi to 0.50mi	0.50mi to 1.00mi	Total
<b><u>Standard Environmental Records</u></b>								
<b>Federal</b>								
DOE FUSRAP	Y	1	0	0	0	0	0	0
NPL	Y	1	1	0	0	0	0	1
PROPOSED NPL	Y	1	0	0	0	0	0	0
DELETED NPL	Y	0.5	0	0	0	0	-	0
SEMS	Y	0.5	1	0	0	0	-	1
ODI	Y	0.5	0	0	0	0	-	0
SEMS ARCHIVE	Y	0.5	0	0	0	0	-	0
CERCLIS	Y	0.5	0	0	0	2	-	2
IODI	Y	0.5	0	0	0	0	-	0
CERCLIS NFRAP	Y	0.5	0	0	0	0	-	0
CERCLIS LIENS	Y	PO	0	-	-	-	-	0
RCRA CORRACTS	Y	1	0	0	0	0	0	0
RCRA TSD	Y	0.5	0	0	0	0	-	0
RCRA LQG	Y	0.25	0	0	0	-	-	0
RCRA SQG	Y	0.25	0	0	0	-	-	0
RCRA VSQG	Y	0.25	0	0	0	-	-	0
RCRA NON GEN	Y	0.25	0	0	0	-	-	0
RCRA CONTROLS	Y	0.5	0	0	0	0	-	0
FED ENG	Y	0.5	1	0	0	0	-	1
FED INST	Y	0.5	1	0	0	0	-	1
LUCIS	Y	0.5	0	0	0	0	-	0
NPL IC	Y	0.5	0	0	0	0	-	0
ERNS 1982 TO 1986	Y	PO	0	-	-	-	-	0
ERNS 1987 TO 1989	Y	PO	0	-	-	-	-	0
ERNS	Y	PO	0	-	-	-	-	0
FED BROWNFIELDS	Y	0.5	0	0	0	0	-	0
FEMA UST	Y	0.25	0	0	0	-	-	0

<b>Database</b>	<b>Searched</b>	<b>Search Radius</b>	<b>Project Property</b>	<b>Within 0.12mi</b>	<b>0.125mi to 0.25mi</b>	<b>0.25mi to 0.50mi</b>	<b>0.50mi to 1.00mi</b>	<b>Total</b>
FRP	Y	0.25	0	0	0	-	-	0
DELISTED FRP	Y	0.25	0	0	0	-	-	0
HIST GAS STATIONS	Y	0.25	0	0	0	-	-	0
REFN	Y	0.25	0	0	0	-	-	0
BULK TERMINAL	Y	0.25	0	0	0	-	-	0
SEMS LIEN	Y	PO	0	-	-	-	-	0
SUPERFUND ROD	Y	1	1	0	0	0	0	1

#### State

COVENANTS	Y	0.5	0	0	0	0	-	0
SUPERFUND NRD	Y	1	1	0	0	0	1	2
LANDFILL METHANE	Y	0.5	0	0	0	0	-	0
SHWS	Y	1	0	0	0	0	0	0
DELISTED SHWS	Y	1	0	0	0	0	0	0
SWF/LF	Y	0.5	1	1	0	0	-	2
HIST LF	Y	0.5	0	0	0	0	-	0
HIST LANDFILLS	Y	0.5	0	0	0	0	-	0
RECYCLING	Y	0.5	0	0	0	0	-	0
LST	Y	0.5	0	0	0	0	-	0
LUST TRUST	Y	0.5	0	0	0	0	-	0
DELISTED LST	Y	0.5	0	0	0	0	-	0
UST	Y	0.25	0	0	0	-	-	0
AST	Y	0.25	0	0	0	-	-	0
TANKS	Y	0.25	0	0	0	-	-	0
DTNK	Y	0.25	0	0	0	-	-	0
AUL	Y	0.5	0	0	0	0	-	0
VCP	Y	0.5	0	0	0	0	-	0
BROWNFIELDS	Y	0.5	0	0	0	1	-	1

#### Tribal

INDIAN LUST	Y	0.5	0	0	0	0	-	0
INDIAN UST	Y	0.25	0	0	0	-	-	0
DELISTED ILST	Y	0.5	0	0	0	0	-	0
DELISTED IUST	Y	0.25	0	0	0	-	-	0

#### County

**No County databases were selected to be included in the search.**

Database	Searched	Search Radius	Project Property	Within 0.12mi	0.125mi to 0.25mi	0.25mi to 0.50mi	0.50mi to 1.00mi	Total
<b><u>Additional Environmental Records</u></b>								
<b>Federal</b>								
FINDS/FRS	Y	PO	1	-	-	-	-	1
TRIS	Y	PO	0	-	-	-	-	0
PFAS TRI	Y	0.5	0	0	0	0	-	0
PFAS NPL	Y	0.5	0	0	0	0	-	0
PFAS WATER	Y	0.5	0	0	0	0	-	0
PFAS SSEHRI	Y	0.5	0	0	0	0	-	0
ERNS PFAS	Y	0.5	0	0	0	0	-	0
HMIRS	Y	0.125	0	0	-	-	-	0
NCDL	Y	0.125	0	0	-	-	-	0
TSCA	Y	0.125	0	0	-	-	-	0
HIST TSCA	Y	0.125	0	0	-	-	-	0
FTTS ADMIN	Y	PO	0	-	-	-	-	0
FTTS INSP	Y	PO	0	-	-	-	-	0
PRP	Y	PO	0	-	-	-	-	0
SCRD DRYCLEANER	Y	0.5	0	0	0	0	-	0
ICIS	Y	PO	0	-	-	-	-	0
FED DRYCLEANERS	Y	0.25	0	0	0	-	-	0
DELISTED FED DRY	Y	0.25	0	0	0	-	-	0
FUDS	Y	1	0	0	0	0	0	0
FORMER NIKE	Y	1	0	0	0	0	0	0
PIPELINE INCIDENT	Y	PO	0	-	-	-	-	0
MLTS	Y	PO	0	-	-	-	-	0
HIST MLTS	Y	PO	0	-	-	-	-	0
MINES	Y	0.25	0	0	0	-	-	0
SMCRA	Y	1	0	0	0	0	0	0
MRDS	Y	1	157	0	0	0	5	162
URANIUM	Y	1	0	0	0	0	0	0
ALT FUELS	Y	0.25	0	0	0	-	-	0
AFS	Y	PO	0	-	-	-	-	0
CONSENT DECREES	Y	0.25	0	0	0	-	-	0
SSTS	Y	0.25	0	0	0	-	-	0
PCBT	Y	0.5	0	0	0	0	-	0
PCB	Y	0.5	0	0	0	0	-	0



Database	Searched	Search Radius	Project Property	Within 0.12mi	0.125mi to 0.25mi	0.25mi to 0.50mi	0.50mi to 1.00mi	Total
<b>State</b>								
SPILLS	Y	0.125	0	0	-	-	-	0
OG SPILLS	Y	0.125	0	0	-	-	-	0
DRYCLEANERS	Y	0.25	0	0	0	-	-	0
DELISTED DRYCLEANERS	Y	0.25	0	0	0	-	-	0
AIR PERMITS	Y	0.125	0	0	-	-	-	0
PFAS	Y	0.5	0	0	0	0	-	0
ASBESTOS	Y	0.125	0	0	-	-	-	0
HAZ GEN	Y	0.125	0	0	-	-	-	0
PDES	Y	PO	2	-	-	-	-	2
HAZ TSD	Y	0.5	0	0	0	0	-	0
HAZ CORRACT	Y	1	0	0	0	0	0	0
UMTRA	Y	0.5	0	0	0	0	-	0
<b>Tribal</b> <i>No Tribal additional environmental record sources available for this State.</i>								
<b>County</b> <i>No County additional environmental databases were selected to be included in the search.</i>								
<b>Total:</b>			<b>167</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>6</b>	<b>177</b>

\* PO – Property Only

\* 'Property and adjoining properties' database search radii are set at 0.25 miles.

## Executive Summary: Site Report Summary - Project Property

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
<a href="#">1</a>	SUPERFUND NRD	BONITA PEAK MINING DISTRICT	CO	ESE	0.00 / 0.00	118	<a href="#">42</a>
<a href="#">2</a>	MRDS	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10119165</i>	E	0.15 / 813.34	-550	<a href="#">42</a>
<a href="#">3</a>	MRDS	BLACK HAWK ET AL	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10107815</i>	W	0.13 / 700.30	511	<a href="#">42</a>
<a href="#">4</a>	MRDS	AZTEC	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10167745</i>	W	0.12 / 658.03	530	<a href="#">43</a>
<a href="#">4</a>	MRDS	BARNES TUN	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10265002</i>	W	0.12 / 658.03	530	<a href="#">44</a>
<a href="#">5</a>	MRDS	TERRY TUNNEL	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10191718</i>	NNE	0.00 / 0.00	-562	<a href="#">45</a>
<a href="#">6</a>	PDES	Terry Tunnel	CR 25 Silverton CO 81433	NE	0.00 / 0.00	-694	<a href="#">45</a>
<a href="#">7</a>	MRDS	BEN FRANKLIN	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10018672</i>	NNW	0.01 / 27.73	-93	<a href="#">47</a>
<a href="#">7</a>	MRDS	BEN FRANKLIN	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10143362</i>	NNW	0.01 / 27.73	-93	<a href="#">48</a>
<a href="#">8</a>	MRDS	SUNNYSIDE	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10167210</i>	NNW	0.01 / 77.87	-100	<a href="#">49</a>
<a href="#">9</a>	MRDS	LEAD CARBONATE	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10018661</i>	WSW	0.00 / 0.00	1024	<a href="#">52</a>
<a href="#">10</a>	MRDS	GRIVITZA, MOUNTAIN EAGLE, NORMAN	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10108456</i>	WNW	0.11 / 606.11	695	<a href="#">53</a>
<a href="#">10</a>	MRDS	GOLD KING	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10018670</i>	WNW	0.11 / 606.11	695	<a href="#">53</a>

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
<a href="#">11</a>	MRDS	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10288829</i>	ENE	0.00 / 7.88	-735	<a href="#">54</a>
<a href="#">12</a>	MRDS	GEORGE WASHINGTON	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10264377</i>	NNW	0.02 / 96.96	168	<a href="#">55</a>
<a href="#">12</a>	MRDS	GEORGE WASHINGTON	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10018671</i>	NNW	0.02 / 96.96	168	<a href="#">55</a>
<a href="#">13</a>	MRDS	SILVER QUEEN MINE	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10107848</i>	NNE	0.09 / 475.86	825	<a href="#">55</a>
<a href="#">14</a>	MRDS	NATALIE	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10143070</i>	SW	0.06 / 335.76	-41	<a href="#">56</a>
<a href="#">15</a>	MRDS	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10289291</i>	WSW	0.20 / 1,069.51	437	<a href="#">57</a>
<a href="#">16</a>	MRDS	MINNEHAHA	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10143192</i>	W	0.09 / 461.30	-120	<a href="#">57</a>
<a href="#">17</a>	MRDS	GRIVITZA,MOUNTAIN EAGLE	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10143319</i>	NNW	0.03 / 158.15	160	<a href="#">58</a>
<a href="#">18</a>	MRDS	KITTIMAC MINE	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10018545</i>	SW	0.03 / 166.25	59	<a href="#">59</a>
<a href="#">19</a>	MRDS	SILVER BAY MINE	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10009691</i>	W	0.15 / 790.43	-59	<a href="#">59</a>
<a href="#">19</a>	MRDS	BLACK HAWK, OCCIDENTAL	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10107859</i>	W	0.15 / 790.43	-59	<a href="#">60</a>
<a href="#">19</a>	MRDS	BLACK HAWK	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10018662</i>	W	0.15 / 790.43	-59	<a href="#">61</a>
<a href="#">19</a>	MRDS	MINNEHAHA MINE	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10107856</i>	W	0.15 / 790.43	-59	<a href="#">62</a>
<a href="#">20</a>	MRDS	MINNEHAHA MINE	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10018663</i>	W	0.14 / 760.91	-339	<a href="#">63</a>
<a href="#">21</a>	MRDS	TREASURE MTN. GOLD MINING CO.	SAN JUAN COUNTY SILVERTON CO 81433	WNW	0.23 / 1,224.15	-322	<a href="#">63</a>

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
			<i>Dep ID: 10108249</i>				
<a href="#">21</a>	MRDS	PRIDE OF BONITA GROUP	SAN JUAN COUNTY SILVERTON CO 81433	WNW	0.23 / 1,224.15	-322	<a href="#">65</a>
			<i>Dep ID: 10018647</i>				
<a href="#">21</a>	MRDS	BURROWS - LITTLE IOLA	SAN JUAN COUNTY SILVERTON CO 81433	WNW	0.23 / 1,224.15	-322	<a href="#">65</a>
			<i>Dep ID: 10108450</i>				
<a href="#">22</a>	PDES	Sunnyside Basin	CR 9 Silverton CO 81433	N	0.00 / 0.00	1045	<a href="#">66</a>
<a href="#">23</a>	MRDS	GOLD PRINCE	SAN JUAN COUNTY SILVERTON CO 81433	N	0.00 / 0.00	946	<a href="#">68</a>
			<i>Dep ID: 10289152</i>				
<a href="#">24</a>	MRDS	NO NAME	SAN JUAN COUNTY SILVERTON CO 81433	N	0.00 / 0.00	590	<a href="#">68</a>
			<i>Dep ID: 10167197</i>				
<a href="#">25</a>	NPL	BONITA PEAK MINING DISTRICT; BONITA PEAK MINING DISTRICT	Multiple sources near Animas River headwaters; Multiple sources near Animas River headwaters UNINCORPORATED CO 81433 <i>EPA ID: CON000802497</i>	ESE	0.00 / 0.00	118	<a href="#">69</a>
<a href="#">26</a>	SEMS	BONITA PEAK MINING DISTRICT	Multiple sources near Animas River headwaters UNINCORPORATED CO 81433 <i>EPA ID: CON000802497</i>	NNW	0.00 / 0.00	195	<a href="#">104</a>
<a href="#">26</a>	FINDS/FRS	BONITA PEAK MINING DISTRICT	MULTIPLE SOURCES NEAR ANIMAS RIVER HEADWATERS UNINCORPORATED CO 81433 <i>Registry ID: 110070058573</i>	NNW	0.00 / 0.00	195	<a href="#">107</a>
<a href="#">26</a>	SUPERFUND ROD	BONITA PEAK MINING DISTRICT	Multiple sources near Animas River headwaters UNINCORPORATED CO 81433	NNW	0.00 / 0.00	195	<a href="#">107</a>
<a href="#">26</a>	FED INST	BONITA PEAK MINING DISTRICT	Multiple sources near Animas River headwaters UNINCORPORATED CO 81433 <i>EPA ID: CON000802497</i>	NNW	0.00 / 0.00	195	<a href="#">108</a>
<a href="#">26</a>	FED ENG	BONITA PEAK MINING DISTRICT	Multiple sources near Animas River headwaters UNINCORPORATED CO 81433 <i>EPA ID: CON000802497</i>	NNW	0.00 / 0.00	195	<a href="#">109</a>
<a href="#">27</a>	MRDS	LEAD CARBONATE MINE	SAN JUAN COUNTY SILVERTON CO 81433	WNW	0.37 / 1,939.07	-217	<a href="#">112</a>

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
			<i>Dep ID: 10264986</i>				
<a href="#">28</a>	MRDS	BLACK HAWK	SAN JUAN COUNTY SILVERTON CO 81433	W	0.27 / 1,418.07	-500	<a href="#">113</a>
			<i>Dep ID: 10265018</i>				
<a href="#">29</a>	MRDS	MIDWAY	SAN JUAN COUNTY SILVERTON CO 81433	N	0.00 / 0.00	779	<a href="#">114</a>
			<i>Dep ID: 10167630</i>				
<a href="#">30</a>	MRDS	BENITOITE	SAN JUAN COUNTY SILVERTON CO 81433	WNW	0.39 / 2,052.17	-139	<a href="#">114</a>
			<i>Dep ID: 10119446</i>				
<a href="#">31</a>	MRDS	BELLE CREOLE	SAN JUAN COUNTY SILVERTON CO 81433	NNW	0.00 / 0.00	307	<a href="#">115</a>
			<i>Dep ID: 10264607</i>				
<a href="#">32</a>	MRDS	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	E	0.03 / 149.60	-1536	<a href="#">116</a>
			<i>Dep ID: 10167148</i>				
<a href="#">33</a>	MRDS	MOCKING BIRD	SAN JUAN COUNTY SILVERTON CO 81433	WNW	0.40 / 2,121.03	-314	<a href="#">116</a>
			<i>Dep ID: 10167595</i>				
<a href="#">34</a>	MRDS	WASHINGTON	SAN JUAN COUNTY SILVERTON CO 81433	NNW	0.00 / 0.00	278	<a href="#">117</a>
			<i>Dep ID: 10216227</i>				
<a href="#">35</a>	MRDS	HIDDEN TREASURE	SAN JUAN COUNTY SILVERTON CO 81433	NNE	0.03 / 170.38	513	<a href="#">118</a>
			<i>Dep ID: 10108457</i>				
<a href="#">35</a>	MRDS	HIDDEN TREASURE	SAN JUAN COUNTY SILVERTON CO 81433	NNE	0.03 / 170.38	513	<a href="#">118</a>
			<i>Dep ID: 10240501</i>				
<a href="#">36</a>	MRDS	SILVER QUEEN	SAN JUAN COUNTY SILVERTON CO 81433	NNE	0.31 / 1,643.07	501	<a href="#">119</a>
			<i>Dep ID: 10018674</i>				
<a href="#">37</a>	MRDS	BLACK HAWK MINE	SAN JUAN COUNTY SILVERTON CO 81433	WNW	0.38 / 1,988.59	-233	<a href="#">119</a>
			<i>Dep ID: 10119261</i>				
<a href="#">38</a>	MRDS	MONTEZUMA NO. 1 AND PLAIN STREAK	SAN JUAN COUNTY SILVERTON CO 81433	SE	0.64 / 3,395.65	-177	<a href="#">120</a>
			<i>Dep ID: 10018648</i>				
<a href="#">39</a>	MRDS	MAGNOLIA	SAN JUAN COUNTY SILVERTON CO 81433	SW	0.08 / 429.88	666	<a href="#">121</a>
			<i>Dep ID: 10018507</i>				
<a href="#">39</a>	MRDS	NATALIE	SAN JUAN COUNTY SILVERTON CO 81433	SW	0.08 / 429.88	666	<a href="#">121</a>
			<i>Dep ID: 10016737</i>				



Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
<a href="#">39</a>	MRDS	SILVER LEDGE	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10108454</i>	SW	0.08 / 429.88	666	<a href="#">122</a>
<a href="#">40</a>	MRDS	ROSS BASIN	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10289028</i>	NW	0.10 / 541.58	231	<a href="#">122</a>
<a href="#">41</a>	MRDS	MASTODON	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10018673</i>	NNE	0.00 / 0.00	426	<a href="#">123</a>
<a href="#">41</a>	MRDS	MASTODON	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10118758</i>	NNE	0.00 / 0.00	426	<a href="#">124</a>
<a href="#">42</a>	MRDS	UNKNOWN GROUP	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10240592</i>	E	0.00 / 23.43	-1487	<a href="#">124</a>
<a href="#">43</a>	MRDS	SILVER QUEEN	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10018675</i>	NNE	0.38 / 2,026.05	501	<a href="#">125</a>
<a href="#">44</a>	MRDS	GOLD PRINCE, MASTEDON	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10009757</i>	NNE	0.06 / 342.08	231	<a href="#">126</a>
<a href="#">44</a>	MRDS	SILVER QUEEN MINE	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10107900</i>	NNE	0.06 / 342.08	231	<a href="#">127</a>
<a href="#">44</a>	MRDS	GOLD PRINCE	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10281398</i>	NNE	0.06 / 342.08	231	<a href="#">128</a>
<a href="#">45</a>	MRDS	LEAD CARBONATE	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10240085</i>	WNW	0.45 / 2,360.98	-588	<a href="#">128</a>
<a href="#">46</a>	MRDS	SILVER QUEEN LEAD ZINC GR	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10142879</i>	NNE	0.27 / 1,408.19	311	<a href="#">129</a>
<a href="#">47</a>	MRDS	PRIDE OF BONITA	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10107846</i>	WNW	0.05 / 273.91	122	<a href="#">130</a>
<a href="#">47</a>	MRDS	EAGLE MOUNTAIN	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10009762</i>	WNW	0.05 / 273.91	122	<a href="#">130</a>
<a href="#">48</a>	MRDS	ROSE	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10108299</i>	NNW	0.11 / 577.93	333	<a href="#">131</a>
<a href="#">49</a>	MRDS	GOLD KING	SAN JUAN COUNTY SILVERTON CO 81433	WNW	0.34 / 1,774.12	-692	<a href="#">132</a>

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
			<i>Dep ID: 10167198</i>				
<a href="#">50</a>	MRDS	GOLD KING	SAN JUAN COUNTY SILVERTON CO 81433	WNW	0.29 / 1,555.65	-602	<a href="#">133</a>
			<i>Dep ID: 10215736</i>				
<a href="#">51</a>	MRDS	SILVER WING PROPERTY	SAN JUAN COUNTY SILVERTON CO 81433	SE	0.65 / 3,456.93	-671	<a href="#">134</a>
			<i>Dep ID: 10018649</i>				
<a href="#">52</a>	MRDS	RANSOME LODE	SAN JUAN COUNTY SILVERTON CO 81433	E	0.01 / 61.97	-1323	<a href="#">135</a>
			<i>Dep ID: 10009487</i>				
<a href="#">53</a>	MRDS	INDEPENDENCE	SAN JUAN COUNTY SILVERTON CO 81433	NNE	0.09 / 500.19	383	<a href="#">136</a>
			<i>Dep ID: 10264760</i>				
<a href="#">54</a>	MRDS	ADELPHIN	SAN JUAN COUNTY SILVERTON CO 81433	NW	0.09 / 478.27	212	<a href="#">136</a>
			<i>Dep ID: 10167141</i>				
<a href="#">55</a>	MRDS	SOUND DEMOCRAT	SAN JUAN COUNTY SILVERTON CO 81433	NNE	0.38 / 1,985.50	293	<a href="#">137</a>
			<i>Dep ID: 10018556</i>				
<a href="#">55</a>	MRDS	SOUND DEMOCRAT	SAN JUAN COUNTY SILVERTON CO 81433	NNE	0.38 / 1,985.50	293	<a href="#">138</a>
			<i>Dep ID: 10143010</i>				
<a href="#">56</a>	MRDS	GLADSTONE	SAN JUAN COUNTY SILVERTON CO 81433	W	0.64 / 3,398.74	-1192	<a href="#">139</a>
			<i>Dep ID: 10142997</i>				
<a href="#">57</a>	MRDS	PLAIN STREAK	SAN JUAN COUNTY SILVERTON CO 81433	E	0.12 / 632.53	-1496	<a href="#">139</a>
			<i>Dep ID: 10191688</i>				
<a href="#">58</a>	MRDS	RED AND BONITA	SAN JUAN COUNTY SILVERTON CO 81433	WNW	0.52 / 2,723.28	-541	<a href="#">140</a>
			<i>Dep ID: 10018669</i>				
<a href="#">58</a>	MRDS	BISMARCK	SAN JUAN COUNTY SILVERTON CO 81433	WNW	0.52 / 2,723.28	-541	<a href="#">141</a>
			<i>Dep ID: 10018668</i>				
<a href="#">59</a>	MRDS	SILVER LEDGE	SAN JUAN COUNTY SILVERTON CO 81433	WSW	0.81 / 4,259.81	-930	<a href="#">141</a>
			<i>Dep ID: 10119122</i>				
<a href="#">60</a>	MRDS	MONTEZUMA #1	SAN JUAN COUNTY SILVERTON CO 81433	E	0.00 / 9.88	-1638	<a href="#">142</a>
			<i>Dep ID: 10143533</i>				
<a href="#">61</a>	MRDS	SILVER QUEEN LEAD ZINC GROUP	SAN JUAN COUNTY SILVERTON CO 81433	NE	0.73 / 3,861.96	303	<a href="#">143</a>
			<i>Dep ID: 10108298</i>				

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
<a href="#">62</a>	MRDS	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10215720</i>	ENE	0.65 / 3,446.70	228	<a href="#">143</a>
<a href="#">63</a>	MRDS	RED & BONITA	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10264483</i>	WNW	0.26 / 1,371.56	-1128	<a href="#">144</a>
<a href="#">64</a>	MRDS	BIG COLORADO	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10240500</i>	W	0.98 / 5,185.84	-1069	<a href="#">145</a>
<a href="#">65</a>	MRDS	ADAMS	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10108455</i>	WNW	0.12 / 642.39	-946	<a href="#">145</a>
<a href="#">66</a>	MRDS	EARLY BIRD	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10017829</i>	ENE	0.73 / 3,836.13	486	<a href="#">145</a>
<a href="#">67</a>	MRDS	ADAMS LODE - BISMARCK	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10119011</i>	WNW	0.12 / 631.98	-931	<a href="#">146</a>
<a href="#">68</a>	MRDS	UNKNOWN GROUP	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10216117</i>	WSW	0.96 / 5,043.47	-789	<a href="#">146</a>
<a href="#">69</a>	MRDS	MOUNTAIN QUEEN	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10119275</i>	NNW	0.01 / 54.03	642	<a href="#">147</a>
<a href="#">70</a>	MRDS	STANDARD MILL	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10240259</i>	W	0.78 / 4,107.74	-1513	<a href="#">148</a>
<a href="#">70</a>	MRDS	AMERICAN TUNNEL	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10265079</i>	W	0.78 / 4,107.74	-1513	<a href="#">149</a>
<a href="#">71</a>	MRDS	PRIDE OF BONITA	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10143474</i>	WNW	0.22 / 1,157.63	-725	<a href="#">149</a>
<a href="#">72</a>	MRDS	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10118706</i>	NE	0.85 / 4,483.39	205	<a href="#">150</a>
<a href="#">73</a>	MRDS	GOLD KING MILL PLACER	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10018664</i>	W	0.78 / 4,116.77	-1579	<a href="#">151</a>
<a href="#">74</a>	MRDS	PITTSBURGH	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10191550</i>	WNW	0.26 / 1,377.10	-1198	<a href="#">151</a>
<a href="#">75</a>	MRDS	BIG COLORADO	SAN JUAN COUNTY SILVERTON CO 81433	WSW	0.90 / 4,762.88	-135	<a href="#">152</a>

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
			<i>Dep ID: 10018659</i>				
<a href="#">75</a>	MRDS	GOLD THREAD	SAN JUAN COUNTY SILVERTON CO 81433	WSW	0.90 / 4,762.88	-135	<a href="#">152</a>
			<i>Dep ID: 10018660</i>				
<a href="#">76</a>	MRDS	BLACK DIAMOND	SAN JUAN COUNTY SILVERTON CO 81433	NNE	0.00 / 0.00	705	<a href="#">153</a>
			<i>Dep ID: 10017770</i>				
<a href="#">77</a>	MRDS	EZRA R	SAN JUAN COUNTY SILVERTON CO 81433	E	0.01 / 69.34	-2267	<a href="#">154</a>
			<i>Dep ID: 10119212</i>				
<a href="#">78</a>	MRDS	GOLD KING	SAN JUAN COUNTY SILVERTON CO 81433	NW	0.12 / 621.06	-196	<a href="#">154</a>
			<i>Dep ID: 10017775</i>				
<a href="#">79</a>	MRDS	MOGUL	SAN JUAN COUNTY SILVERTON CO 81433	NW	0.26 / 1,355.70	-630	<a href="#">155</a>
			<i>Dep ID: 10118864</i>				
<a href="#">80</a>	MRDS	EVENING STAR	SAN JUAN COUNTY SILVERTON CO 81433	NNE	0.25 / 1,298.83	-326	<a href="#">156</a>
			<i>Dep ID: 10167415</i>				
<a href="#">80</a>	MRDS	EVENING STAR	SAN JUAN COUNTY SILVERTON CO 81433	NNE	0.25 / 1,298.83	-326	<a href="#">157</a>
			<i>Dep ID: 10017769</i>				
<a href="#">81</a>	MRDS	QUEEN ANNE	SAN JUAN COUNTY SILVERTON CO 81433	NW	0.00 / 0.00	301	<a href="#">158</a>
			<i>Dep ID: 10017771</i>				
<a href="#">82</a>	MRDS	COLUMBIA	SAN JUAN COUNTY SILVERTON CO 81433	NW	0.00 / 5.14	377	<a href="#">158</a>
			<i>Dep ID: 10017776</i>				
<a href="#">82</a>	MRDS	COLUMBIA	SAN JUAN COUNTY SILVERTON CO 81433	NW	0.00 / 5.14	377	<a href="#">159</a>
			<i>Dep ID: 10264880</i>				
<a href="#">83</a>	MRDS	CUSTER	SAN JUAN COUNTY SILVERTON CO 81433	N	0.21 / 1,095.54	579	<a href="#">159</a>
			<i>Dep ID: 10289358</i>				
<a href="#">83</a>	MRDS	CUSTER	SAN JUAN COUNTY SILVERTON CO 81433	N	0.21 / 1,095.54	579	<a href="#">160</a>
			<i>Dep ID: 10017768</i>				
<a href="#">84</a>	MRDS	QUEEN ANNE	SAN JUAN COUNTY SILVERTON CO 81433	NW	0.01 / 36.74	-90	<a href="#">160</a>
			<i>Dep ID: 10142939</i>				
<a href="#">85</a>	MRDS	INDIAN CHIEF	SAN JUAN COUNTY SILVERTON CO 81433	N	0.42 / 2,227.97	185	<a href="#">161</a>
			<i>Dep ID: 10119458</i>				

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
<a href="#">86</a>	MRDS	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10119404</i>	E	0.24 / 1,279.26	-2087	<a href="#">161</a>
<a href="#">87</a>	MRDS	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10158833</i>	E	0.20 / 1,042.92	-2078	<a href="#">162</a>
<a href="#">88</a>	MRDS	COMO CONSOLIDATED	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10191907</i>	NNW	0.27 / 1,446.44	427	<a href="#">163</a>
<a href="#">89</a>	MRDS	ENDLESS CHAIN	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10167378</i>	E	0.29 / 1,557.00	-1537	<a href="#">164</a>
<a href="#">90</a>	MRDS	AUBURN GROUP	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10167186</i>	E	0.55 / 2,897.17	-1642	<a href="#">164</a>
<a href="#">91</a>	MRDS	ROLLO	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10216484</i>	NNW	0.35 / 1,860.42	310	<a href="#">165</a>
<a href="#">91</a>	MRDS	ROLLO	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10091010</i>	NNW	0.35 / 1,860.42	310	<a href="#">166</a>
<a href="#">92</a>	MRDS	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10191938</i>	SW	0.50 / 2,640.94	-71	<a href="#">166</a>
<a href="#">93</a>	MRDS	DAKOTA	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10018599</i>	SSW	0.14 / 741.57	-331	<a href="#">167</a>
<a href="#">94</a>	MRDS	SILVER CHORD	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10240212</i>	N	0.58 / 3,071.55	507	<a href="#">167</a>
<a href="#">95</a>	MRDS	BELCHER	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10018641</i>	N	0.53 / 2,792.24	522	<a href="#">168</a>
<a href="#">95</a>	MRDS	BELCHER TUN NO.1	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10191916</i>	N	0.53 / 2,792.24	522	<a href="#">168</a>
<a href="#">96</a>	MRDS	BONANZA	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10240027</i>	NNW	0.43 / 2,294.56	164	<a href="#">169</a>
<a href="#">96</a>	MRDS	BONANZA	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10016736</i>	NNW	0.43 / 2,294.56	164	<a href="#">170</a>
<a href="#">97</a>	MRDS	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	SE	0.97 / 5,112.03	-2221	<a href="#">171</a>



Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
			<i>Dep ID: 10215850</i>				
<a href="#">98</a>	MRDS	SEVEN-THIRTY	SAN JUAN COUNTY SILVERTON CO 81433	NNW	0.45 / 2,394.61	135	<a href="#">172</a>
			<i>Dep ID: 10017789</i>				
<a href="#">99</a>	MRDS	RED ROGERS	SAN JUAN COUNTY SILVERTON CO 81433	NNW	0.30 / 1,590.82	417	<a href="#">172</a>
			<i>Dep ID: 10143492</i>				
<a href="#">99</a>	MRDS	RED ROGERS	SAN JUAN COUNTY SILVERTON CO 81433	NNW	0.30 / 1,590.82	417	<a href="#">173</a>
			<i>Dep ID: 10017774</i>				
<a href="#">100</a>	MRDS	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	SW	0.61 / 3,243.12	-348	<a href="#">173</a>
			<i>Dep ID: 10264862</i>				
<a href="#">101</a>	MRDS	SILVER CLOUD	SAN JUAN COUNTY SILVERTON CO 81433	N	0.80 / 4,246.69	618	<a href="#">174</a>
			<i>Dep ID: 10018642</i>				
<a href="#">102</a>	MRDS	HESPERIAN	SAN JUAN COUNTY SILVERTON CO 81433	NNW	0.42 / 2,216.44	277	<a href="#">175</a>
			<i>Dep ID: 10216263</i>				
<a href="#">102</a>	MRDS	SERRANO	SAN JUAN COUNTY SILVERTON CO 81433	NNW	0.42 / 2,216.44	277	<a href="#">176</a>
			<i>Dep ID: 10143330</i>				
<a href="#">103</a>	MRDS	PICKET	SAN JUAN COUNTY SILVERTON CO 81433	NNW	0.55 / 2,923.72	-79	<a href="#">176</a>
			<i>Dep ID: 10118789</i>				
<a href="#">104</a>	MRDS	UNKNOWN GROUP	SAN JUAN COUNTY SILVERTON CO 81433	SW	0.60 / 3,166.06	-97	<a href="#">177</a>
			<i>Dep ID: 10216002</i>				
<a href="#">105</a>	MRDS	BURROWS	SAN JUAN COUNTY SILVERTON CO 81433	N	0.86 / 4,525.12	-263	<a href="#">178</a>
			<i>Dep ID: 10018643</i>				
<a href="#">106</a>	MRDS	EVENING STAR	SAN JUAN COUNTY SILVERTON CO 81433	NNW	0.57 / 3,006.81	-39	<a href="#">178</a>
			<i>Dep ID: 10167581</i>				
<a href="#">107</a>	MRDS	LITTLE IDA	SAN JUAN COUNTY SILVERTON CO 81433	NNE	0.92 / 4,834.87	-150	<a href="#">179</a>
			<i>Dep ID: 10119036</i>				
<a href="#">108</a>	MRDS	CALEDONIAN	SAN JUAN COUNTY SILVERTON CO 81433	ESE	0.76 / 4,010.79	-78	<a href="#">180</a>
			<i>Dep ID: 10017777</i>				
<a href="#">109</a>	MRDS	ACAPULCA	SAN JUAN COUNTY SILVERTON CO 81433	NNW	0.70 / 3,673.23	142	<a href="#">180</a>
			<i>Dep ID: 10167815</i>				

<b>Map Key</b>	<b>DB</b>	<b>Company/Site Name</b>	<b>Address</b>	<b>Direction</b>	<b>Distance (mi/ft)</b>	<b>Elev Diff (ft)</b>	<b>Page Number</b>
<a href="#"><u>110</u></a>	MRDS	ACAPULCA	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10018637</i>	NNW	0.75 / 3,961.52	92	<a href="#"><u>181</u></a>
<a href="#"><u>111</u></a>	MRDS	ALASKA	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10108449</i>	NNW	0.71 / 3,763.56	294	<a href="#"><u>182</u></a>
<a href="#"><u>112</u></a>	MRDS	VALLEY FORGE MINE	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10288746</i>	SSW	0.48 / 2,542.72	-1176	<a href="#"><u>182</u></a>
<a href="#"><u>113</u></a>	MRDS	OCCIDENT TUN	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10192209</i>	ESE	0.88 / 4,663.94	-457	<a href="#"><u>183</u></a>
<a href="#"><u>114</u></a>	MRDS	STAR OF THE WEST	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10264573</i>	NNW	0.96 / 5,043.51	-391	<a href="#"><u>184</u></a>
<a href="#"><u>115</u></a>	MRDS	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10192286</i>	ESE	0.99 / 5,222.79	-1052	<a href="#"><u>185</u></a>
<a href="#"><u>116</u></a>	MRDS	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10191931</i>	SSW	0.10 / 553.66	-1610	<a href="#"><u>185</u></a>
<a href="#"><u>117</u></a>	MRDS	ALASKA	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10288721</i>	NNW	0.97 / 5,134.05	1	<a href="#"><u>186</u></a>
<a href="#"><u>118</u></a>	MRDS	SAXON	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10018639</i>	NNW	1.00 / 5,271.42	-81	<a href="#"><u>187</u></a>
<a href="#"><u>119</u></a>	MRDS	MAXWELL	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10118765</i>	SSW	0.25 / 1,319.08	-1927	<a href="#"><u>188</u></a>
<a href="#"><u>120</u></a>	MRDS	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10288905</i>	SSW	0.27 / 1,430.71	-2014	<a href="#"><u>188</u></a>
<a href="#"><u>121</u></a>	MRDS	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10143041</i>	S	0.59 / 3,127.81	-2550	<a href="#"><u>189</u></a>
<a href="#"><u>122</u></a>	MRDS	MAYFLOWER MILL	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10288826</i>	SSW	0.07 / 352.14	-2537	<a href="#"><u>190</u></a>
<a href="#"><u>123</u></a>	MRDS	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10289254</i>	SSW	0.55 / 2,913.82	-2209	<a href="#"><u>191</u></a>
<a href="#"><u>124</u></a>	MRDS	VALLEY FORGE GROUP	SAN JUAN COUNTY SILVERTON CO 81433	SSW	0.57 / 2,999.16	-2230	<a href="#"><u>191</u></a>

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
			<i>Dep ID: 10018502</i>				
<a href="#">125</a>	MRDS	ASPEN MINE	SAN JUAN COUNTY SILVERTON CO 81433	SSW	0.24 / 1,245.62	-2361	<a href="#">192</a>
			<i>Dep ID: 10215928</i>				
<a href="#">126</a>	MRDS	ASPEN	SAN JUAN COUNTY SILVERTON CO 81433	SSW	0.27 / 1,435.91	-2210	<a href="#">193</a>
			<i>Dep ID: 10108415</i>				
<a href="#">127</a>	SWF/LF	CLOSED SILVERTON LANDFILL	APPROXIMATELY 1 MILE EAST OF TOWN SILVERTON CO	SSW	0.00 / 0.00	-2723	<a href="#">194</a>
<a href="#">128</a>	MRDS	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	SSW	0.18 / 957.08	-2384	<a href="#">195</a>
			<i>Dep ID: 10240506</i>				
<a href="#">129</a>	MRDS	UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	SSW	0.36 / 1,901.81	-1948	<a href="#">196</a>
			<i>Dep ID: 10281162</i>				
<a href="#">130</a>	MRDS	LACKAWANNA MINE	SAN JUAN COUNTY SILVERTON CO 81433	SSW	0.55 / 2,900.72	-1503	<a href="#">197</a>
			<i>Dep ID: 10108414</i>				
<a href="#">131</a>	MRDS	LACKAWANNA MINE	SAN JUAN COUNTY SILVERTON CO 81433	SSW	0.47 / 2,481.01	-2099	<a href="#">198</a>
			<i>Dep ID: 10118703</i>				
<a href="#">132</a>	MRDS	SILVERTON RESERVOIR BOG IRON DEPOSIT	SAN JUAN COUNTY SILVERTON CO 81433	SW	0.65 / 3,433.35	-2821	<a href="#">199</a>
			<i>Dep ID: 10018500</i>				
<a href="#">133</a>	MRDS	DORA	SAN JUAN COUNTY SILVERTON CO 81433	SW	0.81 / 4,278.26	-2823	<a href="#">199</a>
			<i>Dep ID: 10143211</i>				
<a href="#">134</a>	MRDS	LITTLE DORA	SAN JUAN COUNTY SILVERTON CO 81433	SSW	0.92 / 4,875.94	-2718	<a href="#">200</a>
			<i>Dep ID: 10018497</i>				
<a href="#">134</a>	MRDS	CORNING WONDER MINE	SAN JUAN COUNTY SILVERTON CO 81433	SSW	0.92 / 4,875.94	-2718	<a href="#">201</a>
			<i>Dep ID: 10108413</i>				

## Executive Summary: Site Report Summary - Surrounding Properties

Map Key	DB	Company/Site Name	Address	Direction	Distance (mi/ft)	Elev Diff (ft)	Page Number
<a href="#">135</a>	SWF/LF	NEW SILVERTON TRANSFER STATION	Silverton CO	SSW	0.01 / 51.03	-2771	<a href="#">202</a>
<a href="#">136</a>	CERCLIS	RED AND BONITA MINE	COUNTY ROAD 52 SILVERTON CO 81433 <i>Site EPA ID: CON000802811</i>	WNW	0.26 / 1,381.07	-1128	<a href="#">203</a>
<a href="#">137</a>	CERCLIS	MOGUL/GRAND MOGUL MINE(S)	CEMENT CREEK SILVERTON CO 81433 <i>Site EPA ID: CON000802803</i>	NW	0.28 / 1,469.25	-716	<a href="#">204</a>
<a href="#">138</a>	BROWNFIELDS	Lackawanna Mill Site	468 County Road 20 Silverton CO 81433	SSW	0.47 / 2,506.64	-1772	<a href="#">205</a>
<a href="#">139</a>	MRDS	UNKNOWN	OURAY COUNTY OURAY CO 81427 <i>Dep ID: 10143374</i>	NW	0.51 / 2,670.63	-522	<a href="#">205</a>
<a href="#">140</a>	SUPERFUND NRD	IDARADO MINE	TELLURIDE CO	WNW	0.54 / 2,859.93	-528	<a href="#">206</a>
<a href="#">141</a>	MRDS	VERNON MINE	OURAY COUNTY OURAY CO 81427 <i>Dep ID: 10215673</i>	NW	0.62 / 3,291.38	-709	<a href="#">206</a>
<a href="#">142</a>	MRDS	UNKNOWN	OURAY COUNTY OURAY CO 81427 <i>Dep ID: 10287962</i>	NW	0.79 / 4,170.73	-1021	<a href="#">207</a>
<a href="#">143</a>	MRDS	UNKNOWN	OURAY COUNTY OURAY CO 81427 <i>Dep ID: 10118530</i>	NW	0.83 / 4,373.39	-1370	<a href="#">207</a>
<a href="#">144</a>	MRDS	UNKNOWN	OURAY COUNTY OURAY CO 81427 <i>Dep ID: 10143073</i>	WNW	0.87 / 4,592.48	-218	<a href="#">208</a>

## Executive Summary: Summary by Data Source

### Standard

#### Federal

##### NPL - National Priority List

A search of the NPL database, dated May 25, 2022 has found that there are 1 NPL site(s) within approximately 1.00 miles of the project property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (mi/ft)</u>	<u>Map Key</u>
BONITA PEAK MINING DISTRICT; BONITA PEAK MINING DISTRICT	Multiple sources near Animas River headwaters; Multiple sources near Animas River headwaters UNINCORPORATED CO 81433 <i>EPA ID: CON000802497</i>	ESE	0.00 / 0.00	<a href="#">25</a>

##### SEMS - SEMS List 8R Active Site Inventory

A search of the SEMS database, dated Jun 30, 2022 has found that there are 1 SEMS site(s) within approximately 0.50 miles of the project property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (mi/ft)</u>	<u>Map Key</u>
BONITA PEAK MINING DISTRICT	Multiple sources near Animas River headwaters UNINCORPORATED CO 81433 <i>EPA ID: CON000802497</i>	NNW	0.00 / 0.00	<a href="#">26</a>

##### CERCLIS - Comprehensive Environmental Response, Compensation and Liability Information System - CERCLIS

A search of the CERCLIS database, dated Oct 25, 2013 has found that there are 2 CERCLIS site(s) within approximately 0.50 miles of the project property.

<u>Lower Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (mi/ft)</u>	<u>Map Key</u>
RED AND BONITA MINE	COUNTY ROAD 52 SILVERTON CO 81433  <i>Site EPA ID: CON000802811</i>	WNW	0.26 / 1,381.07	<a href="#">136</a>
MOGUL/GRAND MOGUL MINE (S)	CEMENT CREEK SILVERTON CO 81433  <i>Site EPA ID: CON000802803</i>	NW	0.28 / 1,469.25	<a href="#">137</a>

##### FED ENG - Federal Engineering Controls-ECs

A search of the FED ENG database, dated May 25, 2022 has found that there are 1 FED ENG site(s) within approximately 0.50 miles of the project property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (mi/ft)</u>	<u>Map Key</u>
BONITA PEAK MINING DISTRICT	Multiple sources near Animas River headwaters UNINCORPORATED CO 81433	NNW	0.00 / 0.00	<a href="#">26</a>



<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (mi/ft)</u>	<u>Map Key</u>
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*EPA ID: CON000802497*

### **FED INST - Federal Institutional Controls- ICs**

A search of the FED INST database, dated May 25, 2022 has found that there are 1 FED INST site(s) within approximately 0.50 miles of the project property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (mi/ft)</u>	<u>Map Key</u>
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BONITA PEAK MINING DISTRICT	Multiple sources near Animas River headwaters UNINCORPORATED CO 81433 <i>EPA ID: CON000802497</i>	NNW	0.00 / 0.00	<a href="#">26</a>
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### **SUPERFUND ROD - Superfund Decision Documents**

A search of the SUPERFUND ROD database, dated Jul 26, 2022 has found that there are 1 SUPERFUND ROD site(s) within approximately 1.00 miles of the project property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (mi/ft)</u>	<u>Map Key</u>
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BONITA PEAK MINING DISTRICT	Multiple sources near Animas River headwaters UNINCORPORATED CO 81433	NNW	0.00 / 0.00	<a href="#">26</a>
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### **State**

### **SWF/LF - Solid Waste Facilities and Landfills**

A search of the SWF/LF database, dated May 3, 2022 has found that there are 2 SWF/LF site(s) within approximately 0.50 miles of the project property.

<u>Lower Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (mi/ft)</u>	<u>Map Key</u>
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CLOSED SILVERTON LANDFILL	APPROXIMATELY 1 MILE EAST OF TOWN SILVERTON CO	SSW	0.00 / 0.00	<a href="#">127</a>
NEW SILVERTON TRANSFER STATION	Silverton CO	SSW	0.01 / 51.03	<a href="#">135</a>

### **BROWNFIELDS - Brownfield Sites**

A search of the BROWNFIELDS database, dated Aug 1, 2022 has found that there are 1 BROWNFIELDS site(s) within approximately 0.50 miles of the project property.

<u>Lower Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (mi/ft)</u>	<u>Map Key</u>
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Lackawanna Mill Site	468 County Road 20 Silverton CO 81433	SSW	0.47 / 2,506.64	<a href="#">138</a>
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### **SUPERFUND NRD - Superfund National Priorities List and Natural Resource Damages sites**

A search of the SUPERFUND NRD database, dated Jun 16, 2021 has found that there are 2 SUPERFUND NRD site(s) within approximately 1.00 miles of the project property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (mi/ft)</u>	<u>Map Key</u>
BONITA PEAK MINING DISTRICT	CO	ESE	0.00 / 0.00	<a href="#"><u>1</u></a>

<u>Lower Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (mi/ft)</u>	<u>Map Key</u>
IDARADO MINE	TELLURIDE CO	WNW	0.54 / 2,859.93	<a href="#"><u>140</u></a>

## **Non Standard**

### **Federal**

#### **FINDS/FRS - Facility Registry Service/Facility Index**

A search of the FINDS/FRS database, dated Nov 2, 2020 has found that there are 1 FINDS/FRS site(s) within approximately 0.02 miles of the project property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (mi/ft)</u>	<u>Map Key</u>
BONITA PEAK MINING DISTRICT	MULTIPLE SOURCES NEAR ANIMAS RIVER HEADWATERS UNINCORPORATED CO 81433 <i>Registry ID: 110070058573</i>	NNW	0.00 / 0.00	<a href="#"><u>26</u></a>

#### **MRDS - Mineral Resource Data System**

A search of the MRDS database, dated Mar 15, 2016 has found that there are 162 MRDS site(s) within approximately 1.00 miles of the project property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (mi/ft)</u>	<u>Map Key</u>
BLACK HAWK ET AL	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10107815</i>	W	0.13 / 700.30	<a href="#"><u>3</u></a>
AZTEC	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10167745</i>	W	0.12 / 658.03	<a href="#"><u>4</u></a>
BARNES TUN	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10265002</i>	W	0.12 / 658.03	<a href="#"><u>4</u></a>
LEAD CARBONATE	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10018661</i>	WSW	0.00 / 0.00	<a href="#"><u>9</u></a>
GRIVITZA, MOUNTAIN EAGLE, NORMAN	SAN JUAN COUNTY SILVERTON CO 81433 <i>Dep ID: 10108456</i>	WNW	0.11 / 606.11	<a href="#"><u>10</u></a>

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (mi/ft)</u>	<u>Map Key</u>
GOLD KING	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10018670</i>	WNW	0.11 / 606.11	<a href="#"><u>10</u></a>
GEORGE WASHINGTON	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10264377</i>	NNW	0.02 / 96.96	<a href="#"><u>12</u></a>
GEORGE WASHINGTON	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10018671</i>	NNW	0.02 / 96.96	<a href="#"><u>12</u></a>
SILVER QUEEN MINE	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10107848</i>	NNE	0.09 / 475.86	<a href="#"><u>13</u></a>
UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10289291</i>	WSW	0.20 / 1,069.51	<a href="#"><u>15</u></a>
GRIVITZA,MOUNTAIN EAGLE	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10143319</i>	NNW	0.03 / 158.15	<a href="#"><u>17</u></a>
KITTIMAC MINE	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10018545</i>	SW	0.03 / 166.25	<a href="#"><u>18</u></a>
GOLD PRINCE	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10289152</i>	N	0.00 / 0.00	<a href="#"><u>23</u></a>
NO NAME	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10167197</i>	N	0.00 / 0.00	<a href="#"><u>24</u></a>
MIDWAY	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10167630</i>	N	0.00 / 0.00	<a href="#"><u>29</u></a>
BELLE CREOLE	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10264607</i>	NNW	0.00 / 0.00	<a href="#"><u>31</u></a>
WASHINGTON	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10216227</i>	NNW	0.00 / 0.00	<a href="#"><u>34</u></a>
HIDDEN TREASURE	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10108457</i>	NNE	0.03 / 170.38	<a href="#"><u>35</u></a>

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (mi/ft)</u>	<u>Map Key</u>
HIDDEN TREASURE	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10240501</i>	NNE	0.03 / 170.38	<a href="#"><u>35</u></a>
SILVER QUEEN	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10018674</i>	NNE	0.31 / 1,643.07	<a href="#"><u>36</u></a>
MAGNOLIA	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10018507</i>	SW	0.08 / 429.88	<a href="#"><u>39</u></a>
NATALIE	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10016737</i>	SW	0.08 / 429.88	<a href="#"><u>39</u></a>
SILVER LEDGE	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10108454</i>	SW	0.08 / 429.88	<a href="#"><u>39</u></a>
ROSS BASIN	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10289028</i>	NW	0.10 / 541.58	<a href="#"><u>40</u></a>
MASTODON	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10018673</i>	NNE	0.00 / 0.00	<a href="#"><u>41</u></a>
MASTODON	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10118758</i>	NNE	0.00 / 0.00	<a href="#"><u>41</u></a>
SILVER QUEEN	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10018675</i>	NNE	0.38 / 2,026.05	<a href="#"><u>43</u></a>
GOLD PRINCE, MASTEDON	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10009757</i>	NNE	0.06 / 342.08	<a href="#"><u>44</u></a>
SILVER QUEEN MINE	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10107900</i>	NNE	0.06 / 342.08	<a href="#"><u>44</u></a>
GOLD PRINCE	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10281398</i>	NNE	0.06 / 342.08	<a href="#"><u>44</u></a>
SILVER QUEEN LEAD ZINC GR	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10142879</i>	NNE	0.27 / 1,408.19	<a href="#"><u>46</u></a>

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (mi/ft)</u>	<u>Map Key</u>
PRIDE OF BONITA	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10107846</i>	WNW	0.05 / 273.91	<a href="#">47</a>
EAGLE MOUNTAIN	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10009762</i>	WNW	0.05 / 273.91	<a href="#">47</a>
ROSE	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10108299</i>	NNW	0.11 / 577.93	<a href="#">48</a>
INDEPENDENCE	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10264760</i>	NNE	0.09 / 500.19	<a href="#">53</a>
ADELPHIN	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10167141</i>	NW	0.09 / 478.27	<a href="#">54</a>
SOUND DEMOCRAT	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10018556</i>	NNE	0.38 / 1,985.50	<a href="#">55</a>
SOUND DEMOCRAT	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10143010</i>	NNE	0.38 / 1,985.50	<a href="#">55</a>
SILVER QUEEN LEAD ZINC GROUP	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10108298</i>	NE	0.73 / 3,861.96	<a href="#">61</a>
UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10215720</i>	ENE	0.65 / 3,446.70	<a href="#">62</a>
EARLY BIRD	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10017829</i>	ENE	0.73 / 3,836.13	<a href="#">66</a>
MOUNTAIN QUEEN	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10119275</i>	NNW	0.01 / 54.03	<a href="#">69</a>
UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10118706</i>	NE	0.85 / 4,483.39	<a href="#">72</a>
BLACK DIAMOND	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10017770</i>	NNE	0.00 / 0.00	<a href="#">76</a>



<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (mi/ft)</u>	<u>Map Key</u>
QUEEN ANNE	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10017771</i>	NW	0.00 / 0.00	<a href="#"><u>81</u></a>
COLUMBIA	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10017776</i>	NW	0.00 / 5.14	<a href="#"><u>82</u></a>
COLUMBIA	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10264880</i>	NW	0.00 / 5.14	<a href="#"><u>82</u></a>
CUSTER	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10289358</i>	N	0.21 / 1,095.54	<a href="#"><u>83</u></a>
CUSTER	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10017768</i>	N	0.21 / 1,095.54	<a href="#"><u>83</u></a>
INDIAN CHIEF	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10119458</i>	N	0.42 / 2,227.97	<a href="#"><u>85</u></a>
COMO CONSOLIDATED	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10191907</i>	NNW	0.27 / 1,446.44	<a href="#"><u>88</u></a>
ROLLO	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10216484</i>	NNW	0.35 / 1,860.42	<a href="#"><u>91</u></a>
ROLLO	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10091010</i>	NNW	0.35 / 1,860.42	<a href="#"><u>91</u></a>
SILVER CHORD	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10240212</i>	N	0.58 / 3,071.55	<a href="#"><u>94</u></a>
BELCHER	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10018641</i>	N	0.53 / 2,792.24	<a href="#"><u>95</u></a>
BELCHER TUN NO.1	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10191916</i>	N	0.53 / 2,792.24	<a href="#"><u>95</u></a>
BONANZA	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10240027</i>	NNW	0.43 / 2,294.56	<a href="#"><u>96</u></a>

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (mi/ft)</u>	<u>Map Key</u>
BONANZA	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10016736</i>	NNW	0.43 / 2,294.56	<a href="#"><u>96</u></a>
SEVEN-THIRTY	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10017789</i>	NNW	0.45 / 2,394.61	<a href="#"><u>98</u></a>
RED ROGERS	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10143492</i>	NNW	0.30 / 1,590.82	<a href="#"><u>99</u></a>
RED ROGERS	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10017774</i>	NNW	0.30 / 1,590.82	<a href="#"><u>99</u></a>
SILVER CLOUD	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10018642</i>	N	0.80 / 4,246.69	<a href="#"><u>101</u></a>
HESPERIAN	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10216263</i>	NNW	0.42 / 2,216.44	<a href="#"><u>102</u></a>
SERRANO	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10143330</i>	NNW	0.42 / 2,216.44	<a href="#"><u>102</u></a>
ACAPULCA	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10167815</i>	NNW	0.70 / 3,673.23	<a href="#"><u>109</u></a>
ACAPULCA	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10018637</i>	NNW	0.75 / 3,961.52	<a href="#"><u>110</u></a>
ALASKA	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10108449</i>	NNW	0.71 / 3,763.56	<a href="#"><u>111</u></a>
ALASKA	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10288721</i>	NNW	0.97 / 5,134.05	<a href="#"><u>117</u></a>
<u>Lower Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (mi/ft)</u>	<u>Map Key</u>
UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433  <i>Dep ID: 10119165</i>	E	0.15 / 813.34	<a href="#"><u>2</u></a>
TERRY TUNNEL	SAN JUAN COUNTY SILVERTON CO 81433	NNE	0.00 / 0.00	<a href="#"><u>5</u></a>

<u>Lower Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (mi/ft)</u>	<u>Map Key</u>
	<i>Dep ID: 10191718</i>			
BEN FRANKLIN	SAN JUAN COUNTY SILVERTON CO 81433	NNW	0.01 / 27.73	<a href="#"><u>7</u></a>
	<i>Dep ID: 10018672</i>			
BEN FRANKLIN	SAN JUAN COUNTY SILVERTON CO 81433	NNW	0.01 / 27.73	<a href="#"><u>7</u></a>
	<i>Dep ID: 10143362</i>			
SUNNYSIDE	SAN JUAN COUNTY SILVERTON CO 81433	NNW	0.01 / 77.87	<a href="#"><u>8</u></a>
	<i>Dep ID: 10167210</i>			
UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	ENE	0.00 / 7.88	<a href="#"><u>11</u></a>
	<i>Dep ID: 10288829</i>			
NATALIE	SAN JUAN COUNTY SILVERTON CO 81433	SW	0.06 / 335.76	<a href="#"><u>14</u></a>
	<i>Dep ID: 10143070</i>			
MINNEHAHA	SAN JUAN COUNTY SILVERTON CO 81433	W	0.09 / 461.30	<a href="#"><u>16</u></a>
	<i>Dep ID: 10143192</i>			
SILVER BAY MINE	SAN JUAN COUNTY SILVERTON CO 81433	W	0.15 / 790.43	<a href="#"><u>19</u></a>
	<i>Dep ID: 10009691</i>			
BLACK HAWK, OCCIDENTAL	SAN JUAN COUNTY SILVERTON CO 81433	W	0.15 / 790.43	<a href="#"><u>19</u></a>
	<i>Dep ID: 10107859</i>			
BLACK HAWK	SAN JUAN COUNTY SILVERTON CO 81433	W	0.15 / 790.43	<a href="#"><u>19</u></a>
	<i>Dep ID: 10018662</i>			
MINNEHAHA MINE	SAN JUAN COUNTY SILVERTON CO 81433	W	0.15 / 790.43	<a href="#"><u>19</u></a>
	<i>Dep ID: 10107856</i>			
MINNEHAHA MINE	SAN JUAN COUNTY SILVERTON CO 81433	W	0.14 / 760.91	<a href="#"><u>20</u></a>
	<i>Dep ID: 10018663</i>			
TREASURE MTN. GOLD MINING CO.	SAN JUAN COUNTY SILVERTON CO 81433	WNW	0.23 / 1,224.15	<a href="#"><u>21</u></a>
	<i>Dep ID: 10108249</i>			
PRIDE OF BONITA GROUP	SAN JUAN COUNTY SILVERTON CO 81433	WNW	0.23 / 1,224.15	<a href="#"><u>21</u></a>

<u>Lower Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (mi/ft)</u>	<u>Map Key</u>
	<i>Dep ID: 10018647</i>			
BURROWS - LITTLE IOLA	SAN JUAN COUNTY SILVERTON CO 81433	WNW	0.23 / 1,224.15	<a href="#">21</a>
	<i>Dep ID: 10108450</i>			
LEAD CARBONATE MINE	SAN JUAN COUNTY SILVERTON CO 81433	WNW	0.37 / 1,939.07	<a href="#">27</a>
	<i>Dep ID: 10264986</i>			
BLACK HAWK	SAN JUAN COUNTY SILVERTON CO 81433	W	0.27 / 1,418.07	<a href="#">28</a>
	<i>Dep ID: 10265018</i>			
BENITOITE	SAN JUAN COUNTY SILVERTON CO 81433	WNW	0.39 / 2,052.17	<a href="#">30</a>
	<i>Dep ID: 10119446</i>			
UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	E	0.03 / 149.60	<a href="#">32</a>
	<i>Dep ID: 10167148</i>			
MOCKING BIRD	SAN JUAN COUNTY SILVERTON CO 81433	WNW	0.40 / 2,121.03	<a href="#">33</a>
	<i>Dep ID: 10167595</i>			
BLACK HAWK MINE	SAN JUAN COUNTY SILVERTON CO 81433	WNW	0.38 / 1,988.59	<a href="#">37</a>
	<i>Dep ID: 10119261</i>			
MONTEZUMA NO. 1 AND PLAIN STREAK	SAN JUAN COUNTY SILVERTON CO 81433	SE	0.64 / 3,395.65	<a href="#">38</a>
	<i>Dep ID: 10018648</i>			
UNKNOWN GROUP	SAN JUAN COUNTY SILVERTON CO 81433	E	0.00 / 23.43	<a href="#">42</a>
	<i>Dep ID: 10240592</i>			
LEAD CARBONATE	SAN JUAN COUNTY SILVERTON CO 81433	WNW	0.45 / 2,360.98	<a href="#">45</a>
	<i>Dep ID: 10240085</i>			
GOLD KING	SAN JUAN COUNTY SILVERTON CO 81433	WNW	0.34 / 1,774.12	<a href="#">49</a>
	<i>Dep ID: 10167198</i>			
GOLD KING	SAN JUAN COUNTY SILVERTON CO 81433	WNW	0.29 / 1,555.65	<a href="#">50</a>
	<i>Dep ID: 10215736</i>			
SILVER WING PROPERTY	SAN JUAN COUNTY SILVERTON CO 81433	SE	0.65 / 3,456.93	<a href="#">51</a>

<u>Lower Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (mi/ft)</u>	<u>Map Key</u>
	<i>Dep ID: 10018649</i>			
RANSOME LODE	SAN JUAN COUNTY SILVERTON CO 81433	E	0.01 / 61.97	<a href="#">52</a>
	<i>Dep ID: 10009487</i>			
GLADSTONE	SAN JUAN COUNTY SILVERTON CO 81433	W	0.64 / 3,398.74	<a href="#">56</a>
	<i>Dep ID: 10142997</i>			
PLAIN STREAK	SAN JUAN COUNTY SILVERTON CO 81433	E	0.12 / 632.53	<a href="#">57</a>
	<i>Dep ID: 10191688</i>			
RED AND BONITA	SAN JUAN COUNTY SILVERTON CO 81433	WNW	0.52 / 2,723.28	<a href="#">58</a>
	<i>Dep ID: 10018669</i>			
BISMARCK	SAN JUAN COUNTY SILVERTON CO 81433	WNW	0.52 / 2,723.28	<a href="#">58</a>
	<i>Dep ID: 10018668</i>			
SILVER LEDGE	SAN JUAN COUNTY SILVERTON CO 81433	WSW	0.81 / 4,259.81	<a href="#">59</a>
	<i>Dep ID: 10119122</i>			
MONTEZUMA #1	SAN JUAN COUNTY SILVERTON CO 81433	E	0.00 / 9.88	<a href="#">60</a>
	<i>Dep ID: 10143533</i>			
RED & BONITA	SAN JUAN COUNTY SILVERTON CO 81433	WNW	0.26 / 1,371.56	<a href="#">63</a>
	<i>Dep ID: 10264483</i>			
BIG COLORADO	SAN JUAN COUNTY SILVERTON CO 81433	W	0.98 / 5,185.84	<a href="#">64</a>
	<i>Dep ID: 10240500</i>			
ADAMS	SAN JUAN COUNTY SILVERTON CO 81433	WNW	0.12 / 642.39	<a href="#">65</a>
	<i>Dep ID: 10108455</i>			
ADAMS LODE - BISMARCK	SAN JUAN COUNTY SILVERTON CO 81433	WNW	0.12 / 631.98	<a href="#">67</a>
	<i>Dep ID: 10119011</i>			
UNKNOWN GROUP	SAN JUAN COUNTY SILVERTON CO 81433	WSW	0.96 / 5,043.47	<a href="#">68</a>
	<i>Dep ID: 10216117</i>			
STANDARD MILL	SAN JUAN COUNTY SILVERTON CO 81433	W	0.78 / 4,107.74	<a href="#">70</a>



<u>Lower Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (mi/ft)</u>	<u>Map Key</u>
	<i>Dep ID: 10240259</i>			
AMERICAN TUNNEL	SAN JUAN COUNTY SILVERTON CO 81433	W	0.78 / 4,107.74	<a href="#"><u>70</u></a>
	<i>Dep ID: 10265079</i>			
PRIDE OF BONITA	SAN JUAN COUNTY SILVERTON CO 81433	WNW	0.22 / 1,157.63	<a href="#"><u>71</u></a>
	<i>Dep ID: 10143474</i>			
GOLD KING MILL PLACER	SAN JUAN COUNTY SILVERTON CO 81433	W	0.78 / 4,116.77	<a href="#"><u>73</u></a>
	<i>Dep ID: 10018664</i>			
PITTSBURGH	SAN JUAN COUNTY SILVERTON CO 81433	WNW	0.26 / 1,377.10	<a href="#"><u>74</u></a>
	<i>Dep ID: 10191550</i>			
BIG COLORADO	SAN JUAN COUNTY SILVERTON CO 81433	WSW	0.90 / 4,762.88	<a href="#"><u>75</u></a>
	<i>Dep ID: 10018659</i>			
GOLD THREAD	SAN JUAN COUNTY SILVERTON CO 81433	WSW	0.90 / 4,762.88	<a href="#"><u>75</u></a>
	<i>Dep ID: 10018660</i>			
EZRA R	SAN JUAN COUNTY SILVERTON CO 81433	E	0.01 / 69.34	<a href="#"><u>77</u></a>
	<i>Dep ID: 10119212</i>			
GOLD KING	SAN JUAN COUNTY SILVERTON CO 81433	NW	0.12 / 621.06	<a href="#"><u>78</u></a>
	<i>Dep ID: 10017775</i>			
MOGUL	SAN JUAN COUNTY SILVERTON CO 81433	NW	0.26 / 1,355.70	<a href="#"><u>79</u></a>
	<i>Dep ID: 10118864</i>			
EVENING STAR	SAN JUAN COUNTY SILVERTON CO 81433	NNE	0.25 / 1,298.83	<a href="#"><u>80</u></a>
	<i>Dep ID: 10167415</i>			
EVENING STAR	SAN JUAN COUNTY SILVERTON CO 81433	NNE	0.25 / 1,298.83	<a href="#"><u>80</u></a>
	<i>Dep ID: 10017769</i>			
QUEEN ANNE	SAN JUAN COUNTY SILVERTON CO 81433	NW	0.01 / 36.74	<a href="#"><u>84</u></a>
	<i>Dep ID: 10142939</i>			
UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	E	0.24 / 1,279.26	<a href="#"><u>86</u></a>

<u>Lower Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (mi/ft)</u>	<u>Map Key</u>
	<i>Dep ID: 10119404</i>			
UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	E	0.20 / 1,042.92	<a href="#"><u>87</u></a>
	<i>Dep ID: 10158833</i>			
ENDLESS CHAIN	SAN JUAN COUNTY SILVERTON CO 81433	E	0.29 / 1,557.00	<a href="#"><u>89</u></a>
	<i>Dep ID: 10167378</i>			
AUBURN GROUP	SAN JUAN COUNTY SILVERTON CO 81433	E	0.55 / 2,897.17	<a href="#"><u>90</u></a>
	<i>Dep ID: 10167186</i>			
UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	SW	0.50 / 2,640.94	<a href="#"><u>92</u></a>
	<i>Dep ID: 10191938</i>			
DAKOTA	SAN JUAN COUNTY SILVERTON CO 81433	SSW	0.14 / 741.57	<a href="#"><u>93</u></a>
	<i>Dep ID: 10018599</i>			
UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	SE	0.97 / 5,112.03	<a href="#"><u>97</u></a>
	<i>Dep ID: 10215850</i>			
UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	SW	0.61 / 3,243.12	<a href="#"><u>100</u></a>
	<i>Dep ID: 10264862</i>			
PICKET	SAN JUAN COUNTY SILVERTON CO 81433	NNW	0.55 / 2,923.72	<a href="#"><u>103</u></a>
	<i>Dep ID: 10118789</i>			
UNKNOWN GROUP	SAN JUAN COUNTY SILVERTON CO 81433	SW	0.60 / 3,166.06	<a href="#"><u>104</u></a>
	<i>Dep ID: 10216002</i>			
BURROWS	SAN JUAN COUNTY SILVERTON CO 81433	N	0.86 / 4,525.12	<a href="#"><u>105</u></a>
	<i>Dep ID: 10018643</i>			
EVENING STAR	SAN JUAN COUNTY SILVERTON CO 81433	NNW	0.57 / 3,006.81	<a href="#"><u>106</u></a>
	<i>Dep ID: 10167581</i>			
LITTLE IDA	SAN JUAN COUNTY SILVERTON CO 81433	NNE	0.92 / 4,834.87	<a href="#"><u>107</u></a>
	<i>Dep ID: 10119036</i>			
CALEDONIAN	SAN JUAN COUNTY SILVERTON CO 81433	ESE	0.76 / 4,010.79	<a href="#"><u>108</u></a>

<u>Lower Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (mi/ft)</u>	<u>Map Key</u>
	<i>Dep ID: 10017777</i>			
VALLEY FORGE MINE	SAN JUAN COUNTY SILVERTON CO 81433	SSW	0.48 / 2,542.72	<a href="#">112</a>
	<i>Dep ID: 10288746</i>			
OCCIDENT TUN	SAN JUAN COUNTY SILVERTON CO 81433	ESE	0.88 / 4,663.94	<a href="#">113</a>
	<i>Dep ID: 10192209</i>			
STAR OF THE WEST	SAN JUAN COUNTY SILVERTON CO 81433	NNW	0.96 / 5,043.51	<a href="#">114</a>
	<i>Dep ID: 10264573</i>			
UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	ESE	0.99 / 5,222.79	<a href="#">115</a>
	<i>Dep ID: 10192286</i>			
UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	SSW	0.10 / 553.66	<a href="#">116</a>
	<i>Dep ID: 10191931</i>			
SAXON	SAN JUAN COUNTY SILVERTON CO 81433	NNW	1.00 / 5,271.42	<a href="#">118</a>
	<i>Dep ID: 10018639</i>			
MAXWELL	SAN JUAN COUNTY SILVERTON CO 81433	SSW	0.25 / 1,319.08	<a href="#">119</a>
	<i>Dep ID: 10118765</i>			
UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	SSW	0.27 / 1,430.71	<a href="#">120</a>
	<i>Dep ID: 10288905</i>			
UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	S	0.59 / 3,127.81	<a href="#">121</a>
	<i>Dep ID: 10143041</i>			
MAYFLOWER MILL	SAN JUAN COUNTY SILVERTON CO 81433	SSW	0.07 / 352.14	<a href="#">122</a>
	<i>Dep ID: 10288826</i>			
UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	SSW	0.55 / 2,913.82	<a href="#">123</a>
	<i>Dep ID: 10289254</i>			
VALLEY FORGE GROUP	SAN JUAN COUNTY SILVERTON CO 81433	SSW	0.57 / 2,999.16	<a href="#">124</a>
	<i>Dep ID: 10018502</i>			
ASPEN MINE	SAN JUAN COUNTY SILVERTON CO 81433	SSW	0.24 / 1,245.62	<a href="#">125</a>

<u>Lower Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (mi/ft)</u>	<u>Map Key</u>
	<i>Dep ID: 10215928</i>			
ASPEN	SAN JUAN COUNTY SILVERTON CO 81433	SSW	0.27 / 1,435.91	<a href="#">126</a>
	<i>Dep ID: 10108415</i>			
UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	SSW	0.18 / 957.08	<a href="#">128</a>
	<i>Dep ID: 10240506</i>			
UNKNOWN	SAN JUAN COUNTY SILVERTON CO 81433	SSW	0.36 / 1,901.81	<a href="#">129</a>
	<i>Dep ID: 10281162</i>			
LACKAWANNA MINE	SAN JUAN COUNTY SILVERTON CO 81433	SSW	0.55 / 2,900.72	<a href="#">130</a>
	<i>Dep ID: 10108414</i>			
LACKAWANNA MINE	SAN JUAN COUNTY SILVERTON CO 81433	SSW	0.47 / 2,481.01	<a href="#">131</a>
	<i>Dep ID: 10118703</i>			
SILVERTON RESERVOIR BOG IRON DEPOSIT	SAN JUAN COUNTY SILVERTON CO 81433	SW	0.65 / 3,433.35	<a href="#">132</a>
	<i>Dep ID: 10018500</i>			
DORA	SAN JUAN COUNTY SILVERTON CO 81433	SW	0.81 / 4,278.26	<a href="#">133</a>
	<i>Dep ID: 10143211</i>			
LITTLE DORA	SAN JUAN COUNTY SILVERTON CO 81433	SSW	0.92 / 4,875.94	<a href="#">134</a>
	<i>Dep ID: 10018497</i>			
CORNING WONDER MINE	SAN JUAN COUNTY SILVERTON CO 81433	SSW	0.92 / 4,875.94	<a href="#">134</a>
	<i>Dep ID: 10108413</i>			
UNKNOWN	OURAY COUNTY OURAY CO 81427	NW	0.51 / 2,670.63	<a href="#">139</a>
	<i>Dep ID: 10143374</i>			
VERNON MINE	OURAY COUNTY OURAY CO 81427	NW	0.62 / 3,291.38	<a href="#">141</a>
	<i>Dep ID: 10215673</i>			
UNKNOWN	OURAY COUNTY OURAY CO 81427	NW	0.79 / 4,170.73	<a href="#">142</a>
	<i>Dep ID: 10287962</i>			
UNKNOWN	OURAY COUNTY OURAY CO 81427	NW	0.83 / 4,373.39	<a href="#">143</a>

<u>Lower Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (mi/ft)</u>	<u>Map Key</u>
<i>Dep ID: 10118530</i>				
UNKNOWN	OURAY COUNTY OURAY CO 81427	WNW	0.87 / 4,592.48	<a href="#">144</a>
<i>Dep ID: 10143073</i>				

## State

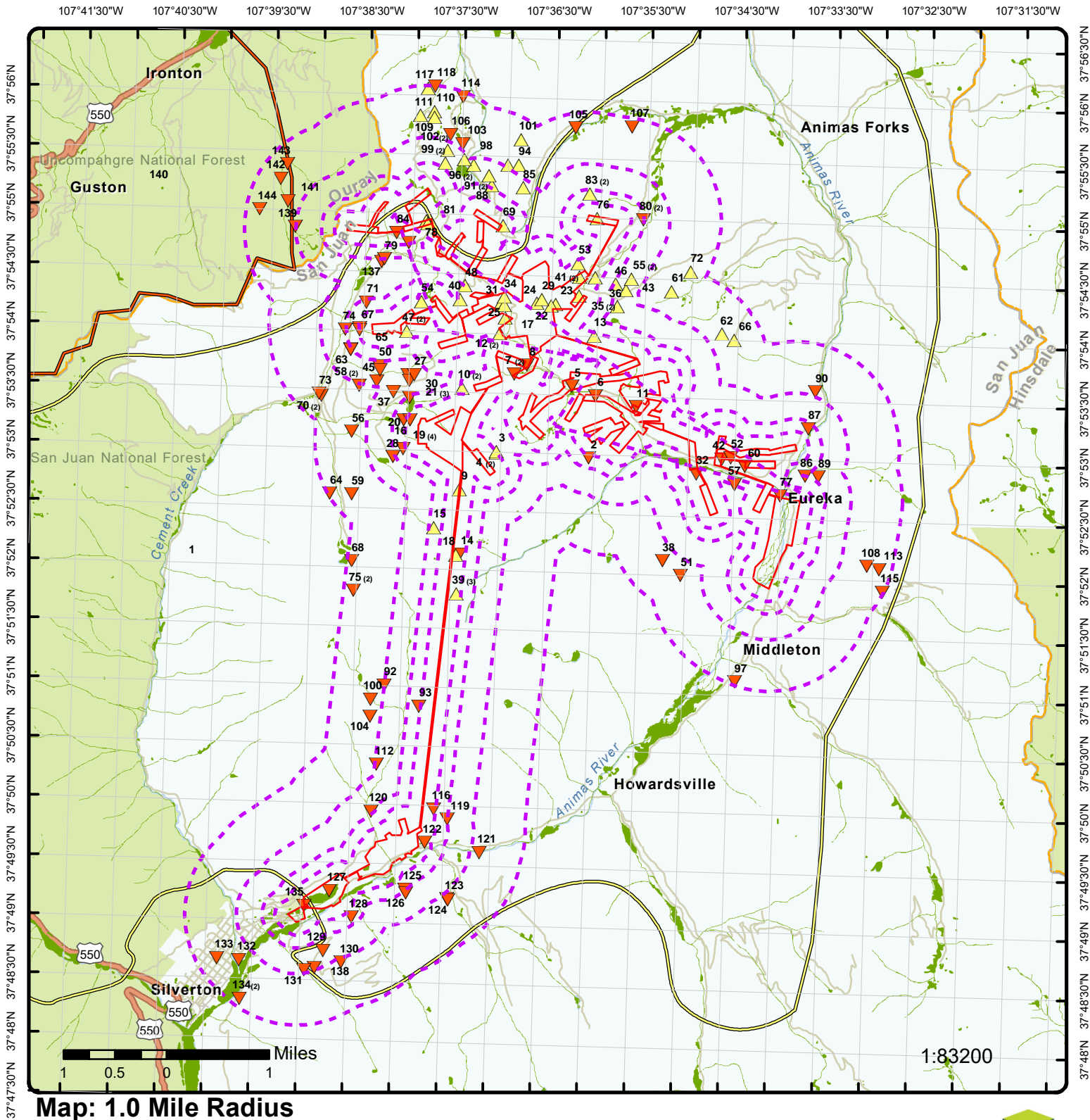
### PDES - Permitted Facilities Listing

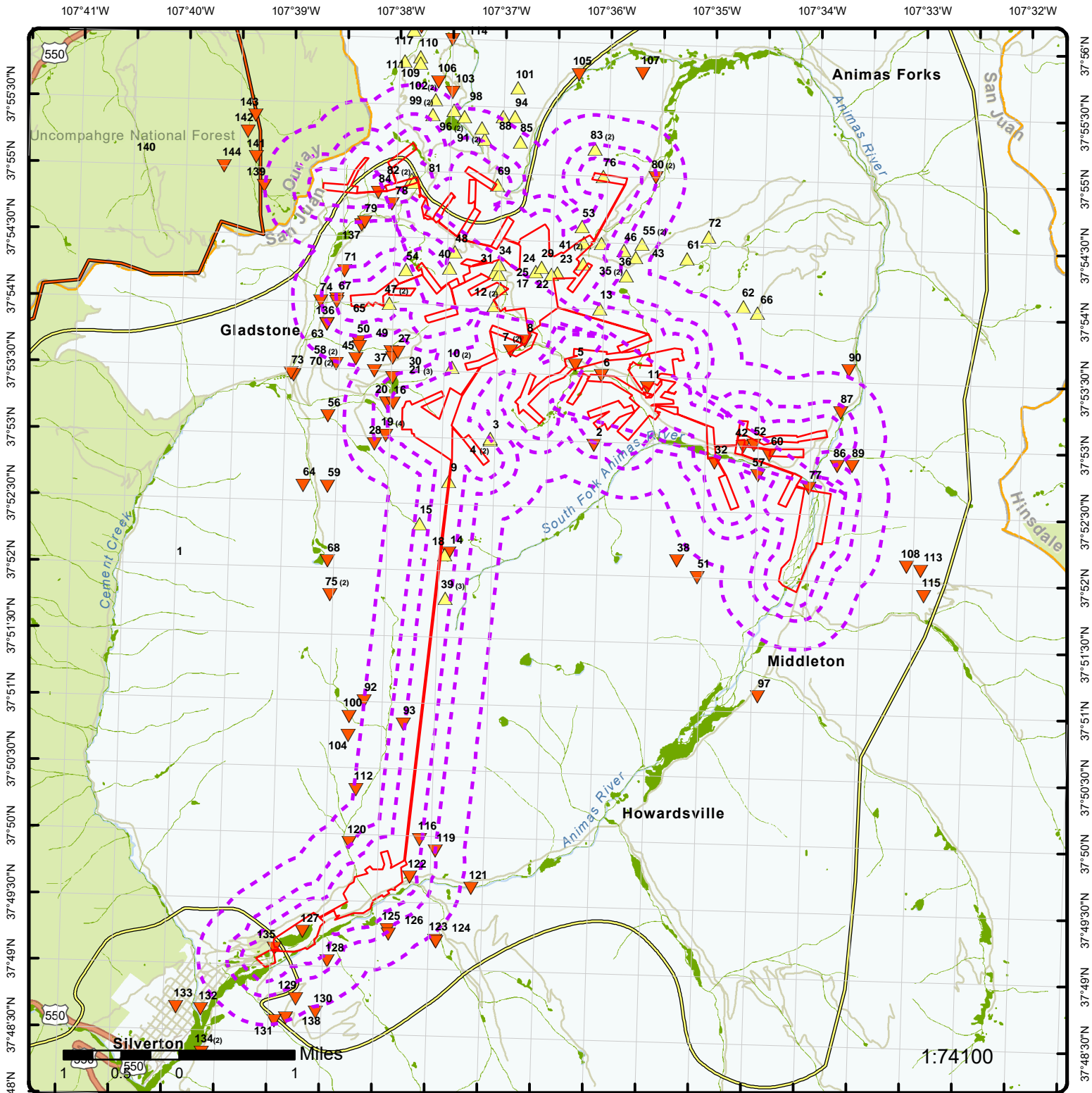
A search of the PDES database, dated Mar 1, 2022 has found that there are 2 PDES site(s) within approximately 0.02 miles of the project property.

<u>Equal/Higher Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (mi/ft)</u>	<u>Map Key</u>
Sunnyside Basin	CR 9 Silverton CO 81433	N	0.00 / 0.00	<a href="#">22</a>

<u>Lower Elevation</u>	<u>Address</u>	<u>Direction</u>	<u>Distance (mi/ft)</u>	<u>Map Key</u>
Terry Tunnel	CR 25 Silverton CO 81433	NE	0.00 / 0.00	<a href="#">6</a>



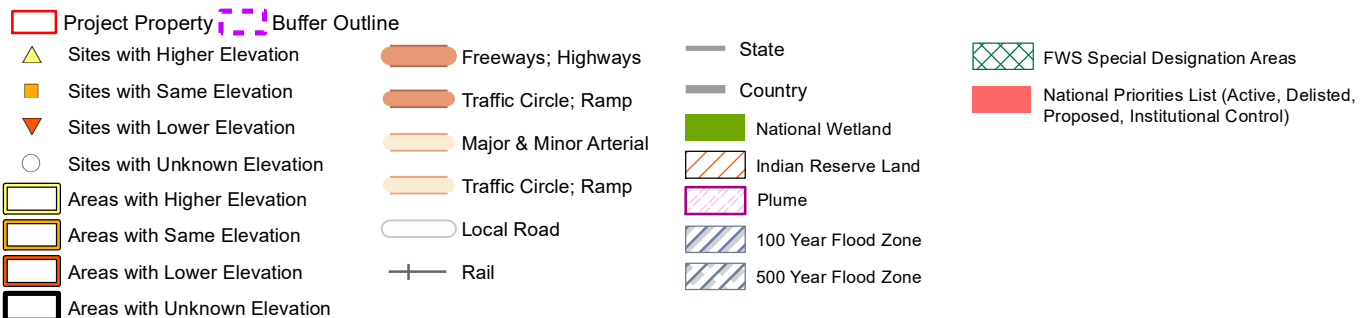


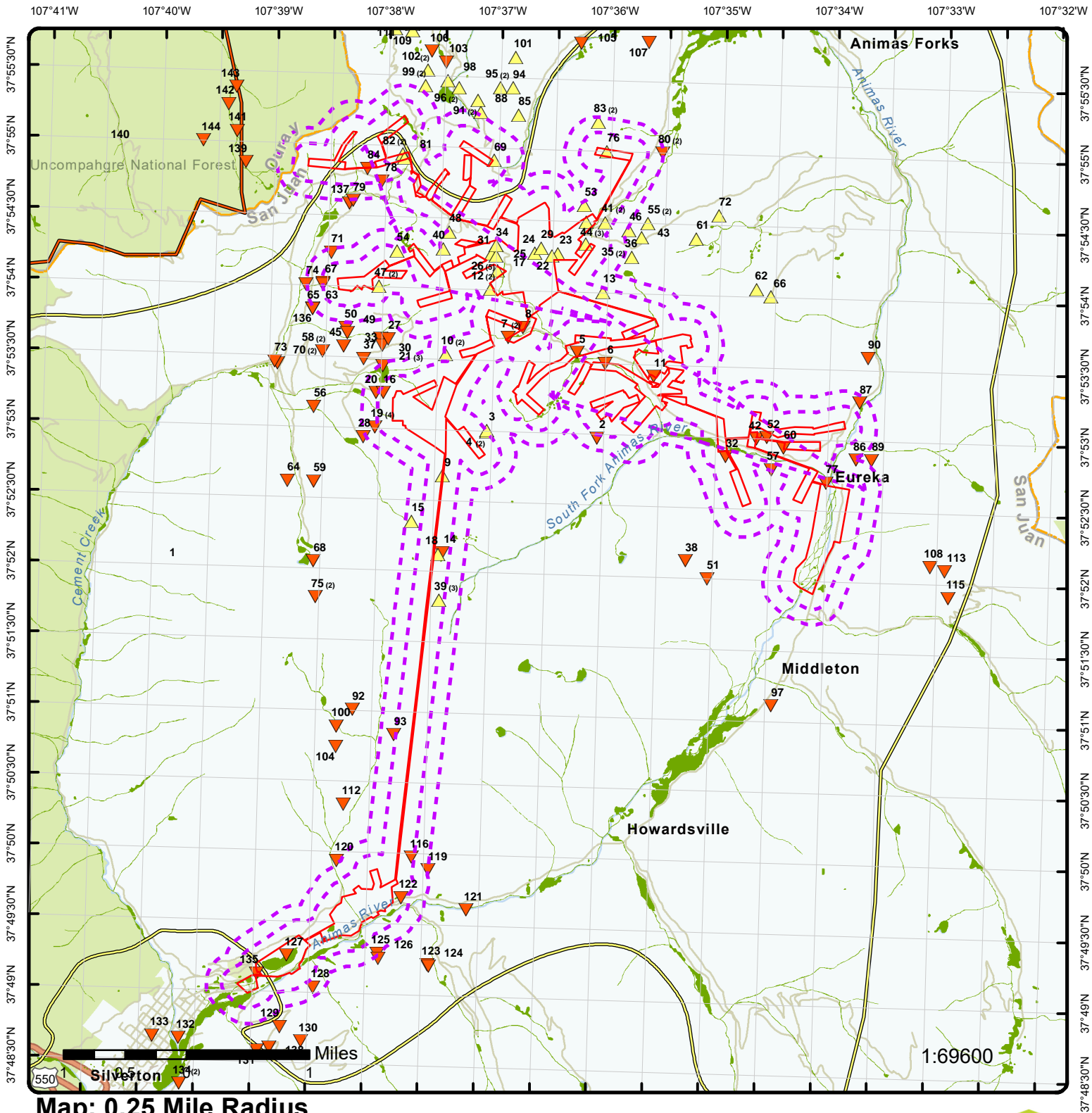


## Map: 0.5 Mile Radius

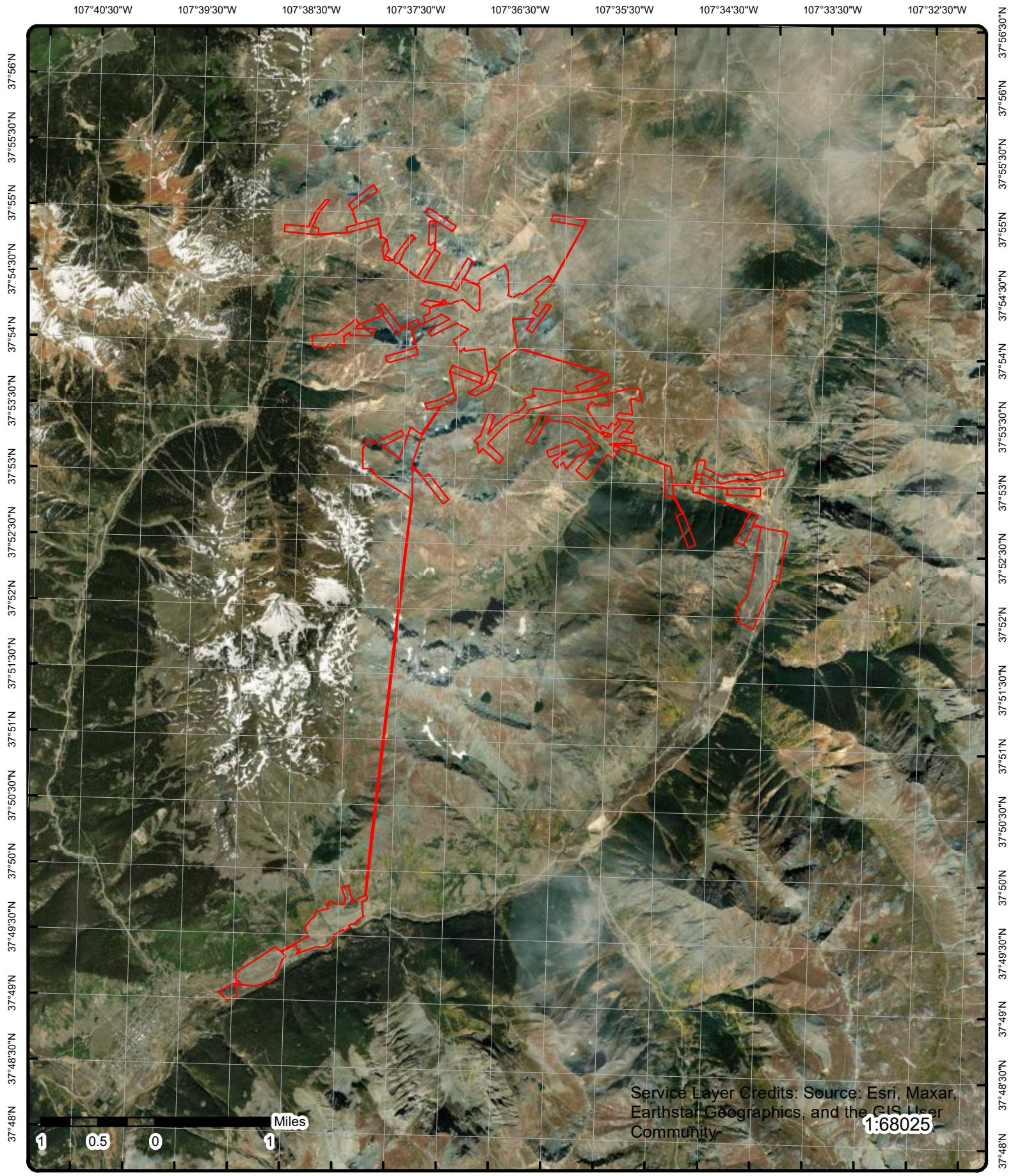
Order Number: 22100605183

Address: San Juan County, Silverton, CO









**Aerial** Year: 2019

Address: San Juan County, Silverton, CO

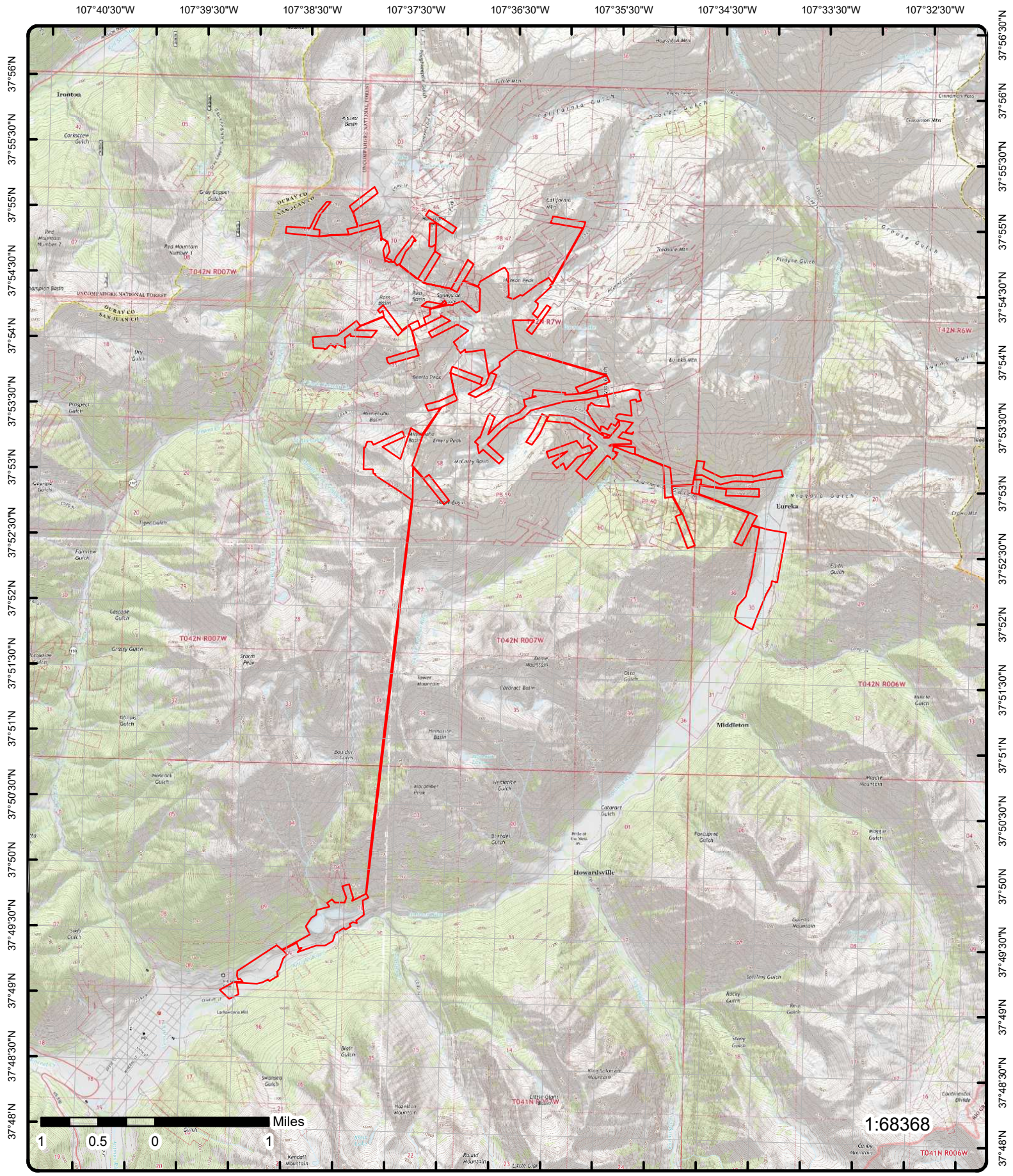
Source: ESRI World Imagery

Order Number: 22100605183



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# Detail Report

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<a href="#">1</a>	1 of 1	ESE	0.00 / 0.00	12,242.35 / 118	BONITA PEAK MINING DISTRICT CO	SUPERFUND NRD
<div> <div>Object ID:</div> <div>ID:</div> <div>Site Status:</div> <div>Pollutants:</div> <div>Webpost:</div> <div>EPA Links:</div> <div>CDPHE Link:</div> </div> <div> <div>29</div> <div>NPL ACTIVE</div> <div>Yes</div> <div><a href="https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0802497">https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0802497</a></div> </div> <div> <div>Latitude:</div> <div>Longitude:</div> <div>Name:</div> <div>City:</div> <div>ZIP Code:</div> </div> <div> <div>37.8567723056421</div> <div>-107.660406699173</div> <div>BONITA PEAK MINING DISTRICT</div> </div>						
<a href="#">2</a>	1 of 1	E	0.15 / 813.34	11,573.92 / -550	UNKNOWN SAN JUAN COUNTY SILVERTON CO 81433	MRDS
<div> <div>Dep ID:</div> <div>Dev Status:</div> <div>Code List:</div> <div>Url:</div> </div> <div> <div>10119165</div> <div>OCCURRENCE</div> <div>ZN AU</div> <div><a href="http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10119165">http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10119165</a></div> </div> <div> <div>I1:</div> <div>Latitude:</div> <div>Longitude:</div> </div> <div> <div>16</div> <div>37.882874</div> <div>-107.600891</div> </div>						
<b>Commodity</b>						
<div> <div>I1:</div> <div>Code:</div> <div>Commodity:</div> <div>Commodity Type:</div> <div>Commodity Group:</div> <div>Importance:</div> </div> <div> <div>20</div> <div>PB</div> <div>Lead</div> <div>Metallic</div> <div>Lead</div> <div>Tertiary</div> </div> <div> <div>Line:</div> <div>Inserted By:</div> <div>Insert Date:</div> <div>Updated By:</div> <div>Update Date:</div> </div> <div> <div>2</div> <div>MAS migration</div> <div>29-OCT-2002 09:00:24</div> <div>USGS</div> <div>29-OCT-2002 09:01:21</div> </div>						
<div> <div>I1:</div> <div>Code:</div> <div>Commodity:</div> <div>Commodity Type:</div> <div>Commodity Group:</div> <div>Importance:</div> </div> <div> <div>20</div> <div>ZN</div> <div>Zinc</div> <div>Metallic</div> <div>Zinc</div> <div>Primary</div> </div> <div> <div>Line:</div> <div>Inserted By:</div> <div>Insert Date:</div> <div>Updated By:</div> <div>Update Date:</div> </div> <div> <div>3</div> <div>MAS migration</div> <div>29-OCT-2002 09:00:24</div> <div>USGS</div> <div>29-OCT-2002 09:01:21</div> </div>						
<div> <div>I1:</div> <div>Code:</div> <div>Commodity:</div> <div>Commodity Type:</div> <div>Commodity Group:</div> <div>Importance:</div> </div> <div> <div>20</div> <div>AU</div> <div>Gold</div> <div>Metallic</div> <div>Gold</div> <div>Tertiary</div> </div> <div> <div>Line:</div> <div>Inserted By:</div> <div>Insert Date:</div> <div>Updated By:</div> <div>Update Date:</div> </div> <div> <div>1</div> <div>MAS migration</div> <div>29-OCT-2002 09:00:24</div> <div>USGS</div> <div>29-OCT-2002 09:01:21</div> </div>						
<b>Names</b>						
<div> <div>I1:</div> <div>Status:</div> <div>Site Name:</div> <div>Line:</div> </div> <div> <div>14</div> <div>Current</div> <div>Unknown</div> <div>1</div> </div> <div> <div>Inserted By:</div> <div>Insert Date:</div> <div>Updated By:</div> <div>Update Date:</div> </div> <div> <div>MAS migration</div> <div>29-OCT-02</div> <div>USGS</div> <div>29-OCT-02</div> </div>						
<a href="#">3</a>	1 of 1	W	0.13 / 700.30	12,635.46 / 511	BLACK HAWK ET AL SAN JUAN COUNTY SILVERTON CO 81433	MRDS

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
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Dep ID:	10107815	I1:	95
Dev Status:	PRODUCER	Latitude:	37.883484
Code List:	PB	Longitude:	-107.61731
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10107815		

Commodity

I1:	30	Line:	1
Code:	PB	Inserted By:	MRDS migration
Commodity:	Lead	Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic	Updated By:	USGS
Commodity Group:	Lead	Update Date:	29-OCT-2002 09:01:16
Importance:	Primary		
I1:	30	Line:	4
Code:	AG	Inserted By:	MRDS migration
Commodity:	Silver	Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic	Updated By:	USGS
Commodity Group:	Silver	Update Date:	29-OCT-2002 09:01:16
Importance:	Primary		
I1:	36	Line:	3
Code:	CU	Inserted By:	MRDS migration
Commodity:	Copper	Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic	Updated By:	USGS
Commodity Group:	Copper	Update Date:	29-OCT-2002 09:02:46
Importance:	Primary		
I1:	30	Line:	2
Code:	ZN	Inserted By:	MRDS migration
Commodity:	Zinc	Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic	Updated By:	USGS
Commodity Group:	Zinc	Update Date:	29-OCT-2002 09:01:16
Importance:	Primary		

Materials

I1:	50	Inserted B:	MRDS migration
Material:	Galena	Insert Dat:	29-OCT-2002 09:44:3
Ore or Gangue:	Ore	Updated By:	
Rec:	1	Update Dat:	

Names

I1:	12	Inserted By:	MRDS migration
Status:	Current	Insert Date:	29-OCT-02
Site Name:	Black Hawk Et Al	Updated By:	USGS
Line:	1	Update Date:	29-OCT-02

<a href="#">4</a>	1 of 2	W	0.12 / 658.03	12,654.11 / 530	AZTEC SAN JUAN COUNTY SILVERTON CO 81433	MRDS
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Dep ID:	10167745	I1:	17
Dev Status:	PAST PRODUCER	Latitude:	37.883301
Code List:	AU PB	Longitude:	-107.61731
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10167745		

Commodity

I1:	64	Line:	4
Code:	ZN	Inserted By:	MAS migration

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Commodity:</b>	Zinc				<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic				<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Zinc				<b>Update Date:</b>	29-OCT-2002 09:01:39
<b>Importance:</b>	Tertiary					
<b>I1:</b>	64				<b>Line:</b>	1
<b>Code:</b>	AU				<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Gold				<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic				<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Gold				<b>Update Date:</b>	29-OCT-2002 09:01:39
<b>Importance:</b>	Primary					
<b>I1:</b>	64				<b>Line:</b>	3
<b>Code:</b>	AG				<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Silver				<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic				<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Silver				<b>Update Date:</b>	29-OCT-2002 09:01:39
<b>Importance:</b>	Tertiary					
<b>I1:</b>	18				<b>Line:</b>	2
<b>Code:</b>	PB				<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Lead				<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic				<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Lead				<b>Update Date:</b>	29-OCT-2002 09:02:38
<b>Importance:</b>	Tertiary					
<b><u>Names</u></b>						
<b>I1:</b>	36				<b>Inserted By:</b>	MAS migration
<b>Status:</b>	Current				<b>Insert Date:</b>	29-OCT-02
<b>Site Name:</b>	Aztec				<b>Updated By:</b>	USGS
<b>Line:</b>	1				<b>Update Date:</b>	29-OCT-02

**4**      **2 of 2**      **W**      **0.12 / 658.03**      **12,654.11 / 530**      **BARNES TUN  
SAN JUAN COUNTY  
SILVERTON CO 81433**      **MRDS**

**Dep ID:** 10265002      **I1:** 98  
**Dev Status:** PAST PRODUCER      **Latitude:** 37.883301  
**Code List:** AG CU      **Longitude:** -107.61731  
**Url:** [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10265002](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10265002)

**Commodity**

<b>I1:</b>	68	<b>Line:</b>	1
<b>Code:</b>	CU	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Copper	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Copper	<b>Update Date:</b>	29-OCT-2002 09:02:21
<b>Importance:</b>	Tertiary		
<b>I1:</b>	68	<b>Line:</b>	3
<b>Code:</b>	PB	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Lead	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Lead	<b>Update Date:</b>	29-OCT-2002 09:02:21
<b>Importance:</b>	Tertiary		
<b>I1:</b>	68	<b>Line:</b>	4
<b>Code:</b>	AG	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Silver	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Silver	<b>Update Date:</b>	29-OCT-2002 09:02:21
<b>Importance:</b>	Primary		
<b>I1:</b>	68	<b>Line:</b>	5

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Code:</b>	ZN				<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Zinc				<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic				<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Zinc				<b>Update Date:</b>	29-OCT-2002 09:02:21
<b>Importance:</b>	Tertiary					
<b>I1:</b>	68				<b>Line:</b>	2
<b>Code:</b>	AU				<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Gold				<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic				<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Gold				<b>Update Date:</b>	29-OCT-2002 09:02:21
<b>Importance:</b>	Tertiary					
<b><u>Names</u></b>						
<b>I1:</b>	36				<b>Inserted By:</b>	MAS migration
<b>Status:</b>	Current				<b>Insert Date:</b>	29-OCT-02
<b>Site Name:</b>	Barnes Tun				<b>Updated By:</b>	USGS
<b>Line:</b>	1				<b>Update Date:</b>	29-OCT-02

<b><u>5</u></b>	<b>1 of 1</b>	<b>NNE</b>	<b>0.00 / 0.00</b>	<b>11,562.48 / -562</b>	<b>TERRY TUNNEL SAN JUAN COUNTY SILVERTON CO 81433</b>	<b>MRDS</b>
<b>Dep ID:</b>	10191718				<b>I1:</b>	10
<b>Dev Status:</b>	PAST PRODUCER				<b>Latitude:</b>	37.892883
<b>Code List:</b>	CU PB				<b>Longitude:</b>	-107.604187
<b>Uri:</b>	<a href="http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10191718">http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10191718</a>					

<b><u>Commodity</u></b>						
<b>I1:</b>	18				<b>Line:</b>	3
<b>Code:</b>	ZN				<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Zinc				<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic				<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Zinc				<b>Update Date:</b>	29-OCT-2002 09:01:48
<b>Importance:</b>	Tertiary					
<b>I1:</b>	33				<b>Line:</b>	1
<b>Code:</b>	CU				<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Copper				<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic				<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Copper				<b>Update Date:</b>	29-OCT-2002 09:01:48
<b>Importance:</b>	Primary					
<b>I1:</b>	33				<b>Line:</b>	2
<b>Code:</b>	PB				<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Lead				<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic				<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Lead				<b>Update Date:</b>	29-OCT-2002 09:01:48
<b>Importance:</b>	Tertiary					
<b><u>Names</u></b>						
<b>I1:</b>	35				<b>Inserted By:</b>	MAS migration
<b>Status:</b>	Current				<b>Insert Date:</b>	29-OCT-02
<b>Site Name:</b>	Terry Tunnel				<b>Updated By:</b>	USGS
<b>Line:</b>	1				<b>Update Date:</b>	29-OCT-02

<b><u>6</u></b>	<b>1 of 1</b>	<b>NE</b>	<b>0.00 / 0.00</b>	<b>11,430.22 / -694</b>	<b>Terry Tunnel CR 25 Silverton CO 81433</b>	<b>PDES</b>
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<b>Permit ID:</b>	COR040058	<b>SW Constr Activity:</b>	
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Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Permit Status:</b>	Admin continued				<b>SW Constr End Date:</b>	
<b>Permit Sector:</b>	Commerce and industry				<b>Permit SIC 1:</b>	1041
<b>Previous Permit ID:</b>					<b>Permit SIC 2:</b>	
<b>Regulation ID:</b>	34				<b>Permit SIC 3:</b>	
<b>Facility Name:</b>	Terry Tunnel				<b>Permit SIC 4:</b>	
<b>Facility Address:</b>	CR 25				<b>Permittee:</b>	Sunnyside Gold Corp c/o Kinross Gold USA Inc
<b>Facility Address 2:</b>					<b>Former Permittee:</b>	
<b>Facility City:</b>	Silverton				<b>Activity Desc:</b>	Mine portal reclamation
<b>Facility State:</b>	CO				<b>Issue Date:</b>	10/1/2006
<b>Facility ZIP:</b>	81433				<b>Effective Date:</b>	10/1/2006
<b>Facility County:</b>	San Juan				<b>Expiration Date:</b>	9/30/2011
<b>Facility Latitude:</b>	37.8917				<b>Permit Sector1:</b>	
<b>Facility Longitude:</b>	-107.6				<b>Permit Sector2:</b>	
<b>Facility SIC Code:</b>	1041				<b>Use category:</b>	
<b>Facility Type:</b>					<b>Termination Date:</b>	
<b>Water Category:</b>					<b>Issuing Org Type:</b>	ST6
<b>Immediate Water:</b>	Eureka Gulch				<b>App Received Date:</b>	8/8/2011
<b>Receiving Water:</b>	Animas River				<b>Ct Status Start Date:</b>	
<b>Stream Segment:</b>	COSJAF02				<b>Ct Status End Date:</b>	
<b>Fee Category:</b>	V-F				<b>Ct Status Reason:</b>	
<b>Add Fee Category 1:</b>					<b>Workplan Year:</b>	
<b>Add Fee Category 2:</b>					<b>UDF3:</b>	
<b>Add Fee Category 3:</b>						
<b>General Permit Tye:</b>		COR040000-Metal mining stormwater				
<b>Compliance Tracking Status:</b>	Y					
<b>SW Constr Start Date:</b>						
<b>Reuse Treater:</b>						
<b>Facility Class First:</b>						
<b>Facility Description:</b>						
<b>Fac Horizontal Coll. Method:</b>						
<b>Facility ICIS Ownership Type:</b>						
<b>Associated Pot W:</b>						
<b>SW Constr Total Acres:</b>						
<b>Reuse Treater ID:</b>						
<b>SW Constr Disturb Acres:</b>						
<b>Facility Class Second:</b>						
<b>Facility Reference Point:</b>						
<b>Major Minor:</b>						
<b>Major River Basin:</b>		San Juan river and Dolores river basins				
<b>Total App on Average Flow No:</b>						
<b>Total App Design Flow No:</b>						
<b>Apprvd for Eltrnc Sub:</b>	Yes					

#### Facility Contact

**Facility Contact Org:** Sunnyside Gold Corp  
**Facility Contact First Name:** Larry  
**Facility Contact Last Name:** Perino  
**Facility Contact Title:** Reclamation Mgr  
**Facility Contact Address:** PO Box 177  
**Facility Contact City:** Silverton  
**Facility Contact State:** CO  
**Facility Contact ZIP code:** 81433  
**Facility Contact Phone:** 208-583-2511  
**Facility Contact Email:** larry.perino@kinross.com

#### Billing

**Billing Organization:** Kinross Gold USA Inc  
**Billing First Name:** Maragaret  
**Billing Last Name:** Sams  
**Billing Title:** AP Specialist  
**Billing Address:** 5075 S Syracuse St Ste 800  
**Billing City:** Denver  
**Billing State:** CO  
**Billing ZIP Code:** 80237  
**Billing Phone:** 303-802-1451



Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
Billing Email:		margaret.sams@kinross.com				
Billing Country:		USA				
<u>DMR</u>						
DMR Org:		Sunnyside Gold Corp				
DMR First Name:		Larry				
DMR Last Name:		Perino				
DMR Title:		Reclamation Mgr				
DMR Address:		PO Box 177				
DMR City:		Silverton				
DMR State:		CO				
DMR ZIP Code:		81433				
DMR Phone:		208-583-2511				
DMR Email:		larry.perino@kinross.com				
Dmr Country:		USA				
<u>Legal</u>						
Legal First Name:		Jim				
Legal Last Name:		Fowler				
Legal Title:		VP North America				
Legal Address:		5075 S Syracuse St Ste 800				
Legal City:		Denver				
Legal State:		CO				
Legal ZIP Code:		80237				
Legal Phone:		303-802-1451				
Legal Email:		jim.fowler@kinross.com				
Legal Country:		USA				
<u>Other</u>						
Other Org:		Kinross Gold USA Inc				
Other First Name:		Steve				
Other Last Name:		Smith				
Other Title:		Env Reclamation Unit Mgr				
Other Address:		5075 S Syracuse St Ste 800				
Other City:		Denver				
Other State:		CO				
Other ZIP Code:		80237				
Other Phone:		208-850-7394				
Other Email:		steve.smith@kinross.com				

<a href="#">7</a>	1 of 2	<b>NNW</b>	<b>0.01 / 27.73</b>	<b>12,030.80 / -93</b>	<b>BEN FRANKLIN SAN JUAN COUNTY SILVERTON CO 81433</b>	<b>MRDS</b>
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<b>Dep ID:</b>	10018672	<b>I1:</b>	42
<b>Dev Status:</b>	PRODUCER	<b>Latitude:</b>	37.89447
<b>Code List:</b>	PB	<b>Longitude:</b>	-107.614502
<b>Url:</b>	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10018672		

**Commodity**

<b>I1:</b>	97	<b>Line:</b>	1
<b>Code:</b>	PB	<b>Inserted By:</b>	MRDS migration
<b>Commodity:</b>	Lead	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Lead	<b>Update Date:</b>	29-OCT-2002 09:00:34
<b>Importance:</b>	Primary		

<b>I1:</b>	97	<b>Line:</b>	2
<b>Code:</b>	ZN	<b>Inserted By:</b>	MRDS migration

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Commodity:</b>	Zinc			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Zinc			<b>Update Date:</b>	29-OCT-2002 09:00:34	
<b>Importance:</b>	Primary					
<b>I1:</b>	97			<b>Line:</b>	3	
<b>Code:</b>	AG			<b>Inserted By:</b>	MRDS migration	
<b>Commodity:</b>	Silver			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Silver			<b>Update Date:</b>	29-OCT-2002 09:00:34	
<b>Importance:</b>	Primary					
<b><u>Materials</u></b>						
<b>I1:</b>	55			<b>Inserted B:</b>	MRDS migration	
<b>Material:</b>	Sphalerite			<b>Insert Dat:</b>	29-OCT-2002 09:44:3	
<b>Ore or Gangue:</b>	Ore			<b>Updated By:</b>		
<b>Rec:</b>	7			<b>Update Dat:</b>		
<b>I1:</b>	77			<b>Inserted B:</b>	MRDS migration	
<b>Material:</b>	Tetrahedrite			<b>Insert Dat:</b>	29-OCT-2002 09:44:3	
<b>Ore or Gangue:</b>	Ore			<b>Updated By:</b>		
<b>Rec:</b>	8			<b>Update Dat:</b>		
<b>I1:</b>	77			<b>Inserted B:</b>	MRDS migration	
<b>Material:</b>	Galena			<b>Insert Dat:</b>	29-OCT-2002 09:44:3	
<b>Ore or Gangue:</b>	Ore			<b>Updated By:</b>		
<b>Rec:</b>	2			<b>Update Dat:</b>		
<b>I1:</b>	20			<b>Inserted B:</b>	MRDS migration	
<b>Material:</b>	Rhodonite			<b>Insert Dat:</b>	29-OCT-2002 09:44:3	
<b>Ore or Gangue:</b>	Ore			<b>Updated By:</b>		
<b>Rec:</b>	5			<b>Update Dat:</b>		
<b>I1:</b>	69			<b>Inserted B:</b>	MRDS migration	
<b>Material:</b>	Chalcopyrite			<b>Insert Dat:</b>	29-OCT-2002 09:44:3	
<b>Ore or Gangue:</b>	Ore			<b>Updated By:</b>		
<b>Rec:</b>	1			<b>Update Dat:</b>		
<b>I1:</b>	77			<b>Inserted B:</b>	MRDS migration	
<b>Material:</b>	Pyrite			<b>Insert Dat:</b>	29-OCT-2002 09:44:3	
<b>Ore or Gangue:</b>	Ore			<b>Updated By:</b>		
<b>Rec:</b>	3			<b>Update Dat:</b>		
<b>I1:</b>	77			<b>Inserted B:</b>	MRDS migration	
<b>Material:</b>	Silver			<b>Insert Dat:</b>	29-OCT-2002 09:44:3	
<b>Ore or Gangue:</b>	Ore			<b>Updated By:</b>		
<b>Rec:</b>	6			<b>Update Dat:</b>		
<b>I1:</b>	17			<b>Inserted B:</b>	MRDS migration	
<b>Material:</b>	Quartz			<b>Insert Dat:</b>	29-OCT-2002 09:44:3	
<b>Ore or Gangue:</b>	Ore			<b>Updated By:</b>		
<b>Rec:</b>	4			<b>Update Dat:</b>		
<b><u>Names</u></b>						
<b>I1:</b>	18			<b>Inserted By:</b>	MRDS migration	
<b>Status:</b>	Current			<b>Insert Date:</b>	29-OCT-02	
<b>Site Name:</b>	Ben Franklin			<b>Updated By:</b>	USGS	
<b>Line:</b>	1			<b>Update Date:</b>	29-OCT-02	

<b>7</b>	<b>2 of 2</b>	<b>NNW</b>	<b>0.01 / 27.73</b>	<b>12,030.80 / -93</b>	<b>BEN FRANKLIN SAN JUAN COUNTY SILVERTON CO 81433</b>	<b>MRDS</b>
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<b>Dep ID:</b>	10143362	<b>I1:</b>	62
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Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Dev Status:</b>	PAST PRODUCER			<b>Latitude:</b>	37.89447	
<b>Code List:</b>	PB AG			<b>Longitude:</b>	-107.614502	
<b>Url:</b>	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10143362					
<b><u>Commodity</u></b>						
<b>I1:</b>	24			<b>Line:</b>	1	
<b>Code:</b>	PB			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Lead			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Lead			<b>Update Date:</b>	29-OCT-2002 09:01:30	
<b>Importance:</b>	Primary					
<b>I1:</b>	20			<b>Line:</b>	2	
<b>Code:</b>	AG			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Silver			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Silver			<b>Update Date:</b>	29-OCT-2002 09:02:37	
<b>Importance:</b>	Tertiary					
<b>I1:</b>	24			<b>Line:</b>	3	
<b>Code:</b>	ZN			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Zinc			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Zinc			<b>Update Date:</b>	29-OCT-2002 09:01:30	
<b>Importance:</b>	Tertiary					
<b><u>Names</u></b>						
<b>I1:</b>	35			<b>Inserted By:</b>	MAS migration	
<b>Status:</b>	Current			<b>Insert Date:</b>	29-OCT-02	
<b>Site Name:</b>	Ben Franklin			<b>Updated By:</b>	USGS	
<b>Line:</b>	1			<b>Update Date:</b>	29-OCT-02	

8

1 of 1

NNW

0.01 /  
77.87

12,024.33 /  
-100

SUNNYSIDE  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

Dep ID: 10167210

Dev Status: PAST PRODUCER

Code List: AU CU MN

Url: [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10167210](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10167210)

I1: 27

Latitude: 37.895691

Longitude: -107.612305

Commodity

I1: 33

Code: AU

Commodity: Gold

Commodity Type: Metallic

Commodity Group: Gold

Importance: Primary

Line: 2

Inserted By: MAS migration

Insert Date: 29-OCT-2002 09:00:24

Updated By: USGS

Update Date: 29-OCT-2002 09:01:39

I1: 28

Code: MN

Commodity: Manganese

Commodity Type: Metallic

Commodity Group: Manganese

Importance: Tertiary

Line: 4

Inserted By: MAS migration

Insert Date: 29-OCT-2002 09:00:24

Updated By: USGS

Update Date: 29-OCT-2002 09:01:39

I1: 33

Code: PB

Commodity: Lead

Commodity Type: Metallic

Commodity Group: Lead

Line: 3

Inserted By: MAS migration

Insert Date: 29-OCT-2002 09:00:24

Updated By: USGS

Update Date: 29-OCT-2002 09:01:39

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<hr/>						
<b>Importance:</b>	Secondary					
<b>I1:</b>	33			<b>Line:</b>	5	
<b>Code:</b>	AG			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Silver			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Silver			<b>Update Date:</b>	29-OCT-2002 09:01:39	
<b>Importance:</b>	Secondary					
<b>I1:</b>	33			<b>Line:</b>	1	
<b>Code:</b>	CU			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Copper			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Copper			<b>Update Date:</b>	29-OCT-2002 09:01:39	
<b>Importance:</b>	Secondary					
<b>I1:</b>	33			<b>Line:</b>	6	
<b>Code:</b>	ZN			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Zinc			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Zinc			<b>Update Date:</b>	29-OCT-2002 09:01:39	
<b>Importance:</b>	Secondary					
 <b><u>Materials</u></b>						
<b>I1:</b>	26			<b>Inserted B:</b>	MAS migration	
<b>Material:</b>	Galena			<b>Insert Dat:</b>	29-OCT-2002 09:44:3	
<b>Ore or Gangue:</b>	Unknown			<b>Updated By:</b>		
<b>Rec:</b>	8			<b>Update Dat:</b>		
<b>I1:</b>	26			<b>Inserted B:</b>	MAS migration	
<b>Material:</b>	Pyrite			<b>Insert Dat:</b>	29-OCT-2002 09:44:3	
<b>Ore or Gangue:</b>	Unknown			<b>Updated By:</b>		
<b>Rec:</b>	11			<b>Update Dat:</b>		
<b>I1:</b>	10			<b>Inserted B:</b>	MAS migration	
<b>Material:</b>	Sphalerite			<b>Insert Dat:</b>	29-OCT-2002 09:44:3	
<b>Ore or Gangue:</b>	Unknown			<b>Updated By:</b>		
<b>Rec:</b>	16			<b>Update Dat:</b>		
<b>I1:</b>	23			<b>Inserted B:</b>	MAS migration	
<b>Material:</b>	Adularia			<b>Insert Dat:</b>	29-OCT-2002 09:44:3	
<b>Ore or Gangue:</b>	Unknown			<b>Updated By:</b>		
<b>Rec:</b>	1			<b>Update Dat:</b>		
<b>I1:</b>	28			<b>Inserted B:</b>	MAS migration	
<b>Material:</b>	Calcite			<b>Insert Dat:</b>	29-OCT-2002 09:44:3	
<b>Ore or Gangue:</b>	Unknown			<b>Updated By:</b>		
<b>Rec:</b>	3			<b>Update Dat:</b>		
<b>I1:</b>	28			<b>Inserted B:</b>	MAS migration	
<b>Material:</b>	Chlorite			<b>Insert Dat:</b>	29-OCT-2002 09:44:3	
<b>Ore or Gangue:</b>	Unknown			<b>Updated By:</b>		
<b>Rec:</b>	5			<b>Update Dat:</b>		
<b>I1:</b>	10			<b>Inserted B:</b>	MAS migration	
<b>Material:</b>	Sericite			<b>Insert Dat:</b>	29-OCT-2002 09:44:3	
<b>Ore or Gangue:</b>	Unknown			<b>Updated By:</b>		
<b>Rec:</b>	15			<b>Update Dat:</b>		
<b>I1:</b>	23			<b>Inserted B:</b>	MAS migration	
<b>Material:</b>	Gold			<b>Insert Dat:</b>	29-OCT-2002 09:44:3	
<b>Ore or Gangue:</b>	Unknown			<b>Updated By:</b>		
<b>Rec:</b>	9			<b>Update Dat:</b>		
<b>I1:</b>	26			<b>Inserted B:</b>	MAS migration	
<b>Material:</b>	Kaolinite			<b>Insert Dat:</b>	29-OCT-2002 09:44:3	
<b>Ore or Gangue:</b>	Unknown			<b>Updated By:</b>		

<b>Map Key</b>	<b>Number of Records</b>	<b>Direction</b>	<b>Distance (mi/ft)</b>	<b>Elev/Diff (ft)</b>	<b>Site</b>	<b>DB</b>
<b>Rec:</b>	10				<b>Update Dat:</b>	
<b>I1:</b>	28				<b>Inserted B:</b>	MAS migration
<b>Material:</b>	Argentite				<b>Insert Dat:</b>	29-OCT-2002 09:44:3
<b>Ore or Gangue:</b>	Unknown				<b>Updated By:</b>	
<b>Rec:</b>	2				<b>Update Dat:</b>	
<b>I1:</b>	28				<b>Inserted B:</b>	MAS migration
<b>Material:</b>	Epidote				<b>Insert Dat:</b>	29-OCT-2002 09:44:3
<b>Ore or Gangue:</b>	Unknown				<b>Updated By:</b>	
<b>Rec:</b>	6				<b>Update Dat:</b>	
<b>I1:</b>	26				<b>Inserted B:</b>	MAS migration
<b>Material:</b>	Quartz				<b>Insert Dat:</b>	29-OCT-2002 09:44:3
<b>Ore or Gangue:</b>	Unknown				<b>Updated By:</b>	
<b>Rec:</b>	12				<b>Update Dat:</b>	
<b>I1:</b>	28				<b>Inserted B:</b>	MAS migration
<b>Material:</b>	Chalcopyrite				<b>Insert Dat:</b>	29-OCT-2002 09:44:3
<b>Ore or Gangue:</b>	Unknown				<b>Updated By:</b>	
<b>Rec:</b>	4				<b>Update Dat:</b>	
<b>I1:</b>	10				<b>Inserted B:</b>	MAS migration
<b>Material:</b>	Rhodochrosit				<b>Insert Dat:</b>	29-OCT-2002 09:44:3
<b>Ore or Gangue:</b>	Unknown				<b>Updated By:</b>	
<b>Rec:</b>	13				<b>Update Dat:</b>	
<b>I1:</b>	10				<b>Inserted B:</b>	MAS migration
<b>Material:</b>	Rhodonite				<b>Insert Dat:</b>	29-OCT-2002 09:44:3
<b>Ore or Gangue:</b>	Unknown				<b>Updated By:</b>	
<b>Rec:</b>	14				<b>Update Dat:</b>	
<b>I1:</b>	26				<b>Inserted B:</b>	MAS migration
<b>Material:</b>	Fluorite				<b>Insert Dat:</b>	29-OCT-2002 09:44:3
<b>Ore or Gangue:</b>	Unknown				<b>Updated By:</b>	
<b>Rec:</b>	7				<b>Update Dat:</b>	
<b><u>Names</u></b>						
<b>I1:</b>	24				<b>Inserted By:</b>	MAS migration
<b>Status:</b>	Previous				<b>Insert Date:</b>	29-OCT-02
<b>Site Name:</b>	American Tunnel				<b>Updated By:</b>	USGS
<b>Line:</b>	4				<b>Update Date:</b>	29-OCT-02
<b><u>Names</u></b>						
<b>I1:</b>	24				<b>Inserted By:</b>	MAS migration
<b>Status:</b>	Previous				<b>Insert Date:</b>	29-OCT-02
<b>Site Name:</b>	Belle Creole				<b>Updated By:</b>	USGS
<b>Line:</b>	6				<b>Update Date:</b>	29-OCT-02
<b><u>Names</u></b>						
<b>I1:</b>	24				<b>Inserted By:</b>	MAS migration
<b>Status:</b>	Previous				<b>Insert Date:</b>	29-OCT-02
<b>Site Name:</b>	Brenneman Mine				<b>Updated By:</b>	USGS
<b>Line:</b>	8				<b>Update Date:</b>	29-OCT-02
<b><u>Names</u></b>						
<b>I1:</b>	24				<b>Inserted By:</b>	MAS migration
<b>Status:</b>	Previous				<b>Insert Date:</b>	29-OCT-02
<b>Site Name:</b>	Gold Prince				<b>Updated By:</b>	USGS
<b>Line:</b>	7				<b>Update Date:</b>	29-OCT-02



Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
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#### Names

<b>I1:</b>	10	<b>Inserted By:</b>	MAS migration
<b>Status:</b>	Previous	<b>Insert Date:</b>	29-OCT-02
<b>Site Name:</b>	Sunnyside Mine Group	<b>Updated By:</b>	USGS
<b>Line:</b>	5	<b>Update Date:</b>	29-OCT-02

#### Names

<b>I1:</b>	24	<b>Inserted By:</b>	MAS migration
<b>Status:</b>	Previous	<b>Insert Date:</b>	29-OCT-02
<b>Site Name:</b>	Washington Mine	<b>Updated By:</b>	USGS
<b>Line:</b>	1	<b>Update Date:</b>	29-OCT-02

#### Names

<b>I1:</b>	24	<b>Inserted By:</b>	MAS migration
<b>Status:</b>	Current	<b>Insert Date:</b>	29-OCT-02
<b>Site Name:</b>	Sunnyside	<b>Updated By:</b>	USGS
<b>Line:</b>	2	<b>Update Date:</b>	29-OCT-02

#### Names

<b>I1:</b>	23	<b>Inserted By:</b>	MAS migration
<b>Status:</b>	Previous	<b>Insert Date:</b>	29-OCT-02
<b>Site Name:</b>	Mogul Mine	<b>Updated By:</b>	USGS
<b>Line:</b>	9	<b>Update Date:</b>	29-OCT-02

<a href="#">9</a>	1 of 1	WSW	0.00 / 0.00	13,148.08 / 1,024	LEAD CARBONATE SAN JUAN COUNTY SILVERTON CO 81433	MRDS
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<b>Dep ID:</b>	10018661	<b>I1:</b>	30
<b>Dev Status:</b>	OCCURRENCE	<b>Latitude:</b>	37.87793
<b>Code List:</b>	PB	<b>Longitude:</b>	-107.623718
<b>Uri:</b>	<a href="http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10018661">http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10018661</a>		

#### Commodity

<b>I1:</b>	93	<b>Line:</b>	1
<b>Code:</b>	PB	<b>Inserted By:</b>	MRDS migration
<b>Commodity:</b>	Lead	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Lead	<b>Update Date:</b>	29-OCT-2002 09:00:34
<b>Importance:</b>	Primary		

<b>I1:</b>	93	<b>Line:</b>	2
<b>Code:</b>	ZN	<b>Inserted By:</b>	MRDS migration
<b>Commodity:</b>	Zinc	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Zinc	<b>Update Date:</b>	29-OCT-2002 09:00:34
<b>Importance:</b>	Primary		

#### Names

<b>I1:</b>	51	<b>Inserted By:</b>	MRDS migration
<b>Status:</b>	Current	<b>Insert Date:</b>	29-OCT-02
<b>Site Name:</b>	Lead Carbonate	<b>Updated By:</b>	USGS
<b>Line:</b>	1	<b>Update Date:</b>	29-OCT-02

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<a href="#">10</a>	1 of 2	WNW	0.11 / 606.11	12,818.72 / 695	GRIVITZA, MOUNTAIN EAGLE, NORMAN SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID:	10108456			I1:	20	
Dev Status:	PRODUCER			Latitude:	37.892273	
Code List:	PB			Longitude:	-107.623718	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10108456					
Commodity						
I1:	25			Line:	2	
Code:	ZN			Inserted By:	MRDS migration	
Commodity:	Zinc			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Zinc			Update Date:	29-OCT-2002 09:01:16	
Importance:	Primary					
I1:	25			Line:	3	
Code:	CU			Inserted By:	MRDS migration	
Commodity:	Copper			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Copper			Update Date:	29-OCT-2002 09:01:16	
Importance:	Primary					
I1:	25			Line:	4	
Code:	AG			Inserted By:	MRDS migration	
Commodity:	Silver			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Silver			Update Date:	29-OCT-2002 09:01:16	
Importance:	Primary					
I1:	25			Line:	5	
Code:	AU			Inserted By:	MRDS migration	
Commodity:	Gold			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Gold			Update Date:	29-OCT-2002 09:01:16	
Importance:	Primary					
I1:	35			Line:	1	
Code:	PB			Inserted By:	MRDS migration	
Commodity:	Lead			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Lead			Update Date:	29-OCT-2002 09:01:16	
Importance:	Primary					
Names						
I1:	31			Inserted By:	MRDS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Grivitza, Mountain Eagle, Norman			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	
<a href="#">10</a>	2 of 2	WNW	0.11 / 606.11	12,818.72 / 695	GOLD KING SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID:	10018670			I1:	26	
Dev Status:	OCCURRENCE			Latitude:	37.892273	
Code List:	W			Longitude:	-107.623718	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10018670					

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<u>Commodity</u>						
I1:	95			Line:	1	
Code:	W			Inserted By:	MRDS migration	
Commodity:	Tungsten			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Tungsten			Update Date:	29-OCT-2002 09:00:34	
Importance:	Primary					
<u>Materials</u>						
I1:	29			Inserted B:	MRDS migration	
Material:	Huebnerite			Insert Dat:	29-OCT-2002 09:44:3	
Ore or Gangue:	Ore			Updated By:		
Rec:	1			Update Dat:		
<u>Names</u>						
I1:	18			Inserted By:	MRDS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Gold King			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	
<a href="#">11</a>	1 of 1	ENE	0.00 / 7.88	11,388.77 / -735	UNKNOWN SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID:	10288829			I1:	23	
Dev Status:	UNKNOWN			Latitude:	37.89032	
Code List:	ZN AU			Longitude:	-107.592712	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10288829					
<u>Commodity</u>						
I1:	13			Line:	1	
Code:	AU			Inserted By:	MAS migration	
Commodity:	Gold			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Gold			Update Date:	29-OCT-2002 09:02:30	
Importance:	Tertiary					
I1:	14			Line:	2	
Code:	PB			Inserted By:	MAS migration	
Commodity:	Lead			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Lead			Update Date:	29-OCT-2002 09:02:41	
Importance:	Tertiary					
I1:	13			Line:	3	
Code:	ZN			Inserted By:	MAS migration	
Commodity:	Zinc			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Zinc			Update Date:	29-OCT-2002 09:02:30	
Importance:	Primary					
<u>Names</u>						
I1:	14			Inserted By:	MAS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Unknown			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<a href="#">12</a>	1 of 2	NNW	0.02 / 96.96	12,292.30 / 168	GEORGE WASHINGTON SAN JUAN COUNTY SILVERTON CO 81433	MRDS
<hr/>						
Dep ID:	10264377			I1:	91	
Dev Status:	PAST PRODUCER			Latitude:	37.900085	
Code List:	GEM			Longitude:	-107.61731	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10264377					
<hr/>						
<u>Commodity</u>						
I1:	18			Line:	1	
Code:	GEM			Inserted By:	MAS migration	
Commodity:	Gemstone			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Non-metallic			Updated By:	USGS	
Commodity Group:	Gemstones			Update Date:	29-OCT-2002 09:02:20	
Importance:	Primary					
<hr/>						
<u>Names</u>						
I1:	35			Inserted By:	MAS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	George Washington			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	
<hr/>						
<a href="#">12</a>	2 of 2	NNW	0.02 / 96.96	12,292.30 / 168	GEORGE WASHINGTON SAN JUAN COUNTY SILVERTON CO 81433	MRDS
<hr/>						
Dep ID:	10018671			I1:	16	
Dev Status:	OCCURRENCE			Latitude:	37.900085	
Code List:	GEM			Longitude:	-107.61731	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10018671					
<hr/>						
<u>Commodity</u>						
I1:	96			Line:	1	
Code:	GEM			Inserted By:	MRDS migration	
Commodity:	Gemstone			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Non-metallic			Updated By:	USGS	
Commodity Group:	Gemstones			Update Date:	29-OCT-2002 09:00:34	
Importance:	Primary					
<hr/>						
<u>Materials</u>						
I1:	77			Inserted B:	MRDS migration	
Material:	Rhodonite			Insert Dat:	29-OCT-2002 09:44:3	
Ore or Gangue:	Ore			Updated By:		
Rec:	1			Update Dat:		
<hr/>						
<u>Names</u>						
I1:	18			Inserted By:	MRDS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	George Washington			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	
<hr/>						
<a href="#">13</a>	1 of 1	NNE	0.09 / 475.86	12,948.63 / 825	SILVER QUEEN MINE SAN JUAN COUNTY SILVERTON CO 81433	MRDS

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<hr/>						
Dep ID:	10107848			I1:	28	
Dev Status:	PRODUCER			Latitude:	37.900085	
Code List:	PB			Longitude:	-107.600586	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10107848					
<hr/>						
<u>Commodity</u>						
I1:	31			Line:	1	
Code:	PB			Inserted By:	MRDS migration	
Commodity:	Lead			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Lead			Update Date:	29-OCT-2002 09:01:16	
Importance:	Primary					
<hr/>						
I1:	27			Line:	2	
Code:	ZN			Inserted By:	MRDS migration	
Commodity:	Zinc			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Zinc			Update Date:	29-OCT-2002 09:01:16	
Importance:	Primary					
<hr/>						
<u>Materials</u>						
I1:	19			Inserted B:	MRDS migration	
Material:	Sphalerite			Insert Dat:	29-OCT-2002 09:44:3	
Ore or Gangue:	Ore			Updated By:		
Rec:	2			Update Dat:		
<hr/>						
I1:	17			Inserted B:	MRDS migration	
Material:	Galena			Insert Dat:	29-OCT-2002 09:44:3	
Ore or Gangue:	Ore			Updated By:		
Rec:	1			Update Dat:		
<hr/>						
<u>Names</u>						
I1:	31			Inserted By:	MRDS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Silver Queen Mine			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	

[14](#)

1 of 1

SW

0.06 /  
335.76

12,083.26 /  
-41

NATALIE  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

**Dep ID:** 10143070  
**Dev Status:** PAST PRODUCER  
**Code List:** W  
**Url:** http://mrdata.usgs.gov/mrds/show-mrds.php?dep\_id=10143070

**I1:** 10  
**Latitude:** 37.868896  
**Longitude:** -107.623413

**Commodity**

**I1:** 23  
**Code:** W  
**Commodity:** Tungsten  
**Commodity Type:** Metallic  
**Commodity Group:** Tungsten  
**Importance:** Primary

**Line:** 1  
**Inserted By:** MAS migration  
**Insert Date:** 29-OCT-2002 09:00:24  
**Updated By:** USGS  
**Update Date:** 29-OCT-2002 09:01:30

**Names**

**I1:** 35  
**Status:** Current

**Inserted By:** MAS migration  
**Insert Date:** 29-OCT-02



Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
Site Name:	Natalie				Updated By:	USGS
Line:	1				Update Date:	29-OCT-02

<a href="#">15</a>	1 of 1	WSW	0.20 / 1,069.51	12,560.74 / 437	UNKNOWN SAN JUAN COUNTY SILVERTON CO 81433	MRDS
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Dep ID: 10289291  
 Dev Status: UNKNOWN  
 Code List: ZN CU  
 Url: [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10289291](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10289291)  
 I1: 16  
 Latitude: 37.872498  
 Longitude: -107.628113

#### Commodity

I1: 35  
 Code: AU  
 Commodity: Gold  
 Commodity Type: Metallic  
 Commodity Group: Gold  
 Importance: Tertiary  
 Line: 2  
 Inserted By: MAS migration  
 Insert Date: 29-OCT-2002 09:00:24  
 Updated By: USGS  
 Update Date: 29-OCT-2002 09:02:30

I1: 35  
 Code: AG  
 Commodity: Silver  
 Commodity Type: Metallic  
 Commodity Group: Silver  
 Importance: Tertiary  
 Line: 4  
 Inserted By: MAS migration  
 Insert Date: 29-OCT-2002 09:00:24  
 Updated By: USGS  
 Update Date: 29-OCT-2002 09:02:30

I1: 35  
 Code: PB  
 Commodity: Lead  
 Commodity Type: Metallic  
 Commodity Group: Lead  
 Importance: Tertiary  
 Line: 3  
 Inserted By: MAS migration  
 Insert Date: 29-OCT-2002 09:00:24  
 Updated By: USGS  
 Update Date: 29-OCT-2002 09:02:30

I1: 35  
 Code: CU  
 Commodity: Copper  
 Commodity Type: Metallic  
 Commodity Group: Copper  
 Importance: Tertiary  
 Line: 1  
 Inserted By: MAS migration  
 Insert Date: 29-OCT-2002 09:00:24  
 Updated By: USGS  
 Update Date: 29-OCT-2002 09:02:30

I1: 35  
 Code: ZN  
 Commodity: Zinc  
 Commodity Type: Metallic  
 Commodity Group: Zinc  
 Importance: Primary  
 Line: 5  
 Inserted By: MAS migration  
 Insert Date: 29-OCT-2002 09:00:24  
 Updated By: USGS  
 Update Date: 29-OCT-2002 09:02:30

#### Names

I1: 34  
 Status: Current  
 Site Name: Unknown  
 Line: 2  
 Inserted By: MAS migration  
 Insert Date: 29-OCT-02  
 Updated By: USGS  
 Update Date: 29-OCT-02

<a href="#">16</a>	1 of 1	W	0.09 / 461.30	12,004.34 / -120	MINNEHAHA SAN JUAN COUNTY SILVERTON CO 81433	MRDS
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Dep ID: 10143192  
 Dev Status: PAST PRODUCER  
 Code List: PB ZN  
 Url: [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10143192](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10143192)  
 I1: 81  
 Latitude: 37.887512  
 Longitude: -107.632813

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Commodity</b>						
I1:	24			Line:	1	
Code:	PB			Inserted By:	MAS migration	
Commodity:	Lead			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Lead			Update Date:	29-OCT-2002 09:01:30	
Importance:	Primary					
I1:	24			Line:	2	
Code:	ZN			Inserted By:	MAS migration	
Commodity:	Zinc			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Zinc			Update Date:	29-OCT-2002 09:01:30	
Importance:	Tertiary					
<b>Names</b>						
I1:	35			Inserted By:	MAS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Minnehaha			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	

[17](#)

1 of 1

NNW

0.03 /  
158.15

12,284.28 /  
160

GRIVITZA, MOUNTAIN EAGLE  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

Dep ID: 10143319  
Dev Status: PAST PRODUCER  
Code List: PB CU  
Url: [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10143319](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10143319)

I1: 18  
Latitude: 37.902283  
Longitude: -107.616394

**Commodity**

I1:	24	Line:	3
Code:	PB	Inserted By:	MAS migration
Commodity:	Lead	Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic	Updated By:	USGS
Commodity Group:	Lead	Update Date:	29-OCT-2002 09:01:30
Importance:	Primary		
I1:	24	Line:	2
Code:	AU	Inserted By:	MAS migration
Commodity:	Gold	Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic	Updated By:	USGS
Commodity Group:	Gold	Update Date:	29-OCT-2002 09:01:30
Importance:	Tertiary		
I1:	24	Line:	4
Code:	AG	Inserted By:	MAS migration
Commodity:	Silver	Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic	Updated By:	USGS
Commodity Group:	Silver	Update Date:	29-OCT-2002 09:01:30
Importance:	Tertiary		
I1:	24	Line:	5
Code:	ZN	Inserted By:	MAS migration
Commodity:	Zinc	Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic	Updated By:	USGS
Commodity Group:	Zinc	Update Date:	29-OCT-2002 09:01:30
Importance:	Tertiary		
I1:	24	Line:	1
Code:	CU	Inserted By:	MAS migration

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Commodity:</b> Copper <b>Commodity Type:</b> Metallic <b>Commodity Group:</b> Copper <b>Importance:</b> Tertiary					<b>Insert Date:</b> 29-OCT-2002 09:00:24 <b>Updated By:</b> USGS <b>Update Date:</b> 29-OCT-2002 09:01:30	
<b><u>Names</u></b>						
<b>I1:</b> 24 <b>Status:</b> Current <b>Site Name:</b> Grivitza, Mountain Eagle <b>Line:</b> 1					<b>Inserted By:</b> MAS migration <b>Insert Date:</b> 29-OCT-02 <b>Updated By:</b> USGS <b>Update Date:</b> 29-OCT-02	
<a href="#">18</a>	1 of 1	SW	0.03 / 166.25	12,182.73 / 59	KITTIMAC MINE SAN JUAN COUNTY SILVERTON CO 81433	MRDS
<b>Dep ID:</b> 10018545 <b>Dev Status:</b> OCCURRENCE <b>Code List:</b> CU <b>Url:</b> <a href="http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10018545">http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10018545</a>				<b>I1:</b> 28 <b>Latitude:</b> 37.868713 <b>Longitude:</b> -107.624023		
<b><u>Commodity</u></b>						
<b>I1:</b> 43 <b>Code:</b> PB <b>Commodity:</b> Lead <b>Commodity Type:</b> Metallic <b>Commodity Group:</b> Lead <b>Importance:</b> Primary					<b>Line:</b> 2 <b>Inserted By:</b> MRDS migration <b>Insert Date:</b> 29-OCT-02 <b>Updated By:</b> USGS <b>Update Date:</b> 29-OCT-02	
<b>I1:</b> 43 <b>Code:</b> CU <b>Commodity:</b> Copper <b>Commodity Type:</b> Metallic <b>Commodity Group:</b> Copper <b>Importance:</b> Primary					<b>Line:</b> 1 <b>Inserted By:</b> MRDS migration <b>Insert Date:</b> 29-OCT-02 <b>Updated By:</b> USGS <b>Update Date:</b> 29-OCT-02	
<b>I1:</b> 43 <b>Code:</b> ZN <b>Commodity:</b> Zinc <b>Commodity Type:</b> Metallic <b>Commodity Group:</b> Zinc <b>Importance:</b> Primary					<b>Line:</b> 3 <b>Inserted By:</b> MRDS migration <b>Insert Date:</b> 29-OCT-02 <b>Updated By:</b> USGS <b>Update Date:</b> 29-OCT-02	
<b><u>Names</u></b>						
<b>I1:</b> 14 <b>Status:</b> Current <b>Site Name:</b> Kittimac Mine <b>Line:</b> 1					<b>Inserted By:</b> MRDS migration <b>Insert Date:</b> 29-OCT-02 <b>Updated By:</b> USGS <b>Update Date:</b> 29-OCT-02	

<a href="#">19</a>	1 of 4	W	0.15 / 790.43	12,065.54 / -59	SILVER BAY MINE SAN JUAN COUNTY SILVERTON CO 81433	MRDS
<b>Dep ID:</b> 10009691 <b>Dev Status:</b> PRODUCER <b>Code List:</b> AG <b>Url:</b> <a href="http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10009691">http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10009691</a>				<b>I1:</b> 13 <b>Latitude:</b> 37.883484 <b>Longitude:</b> -107.633911		

**Commodity**

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
I1: Code: Commodity: Commodity Type: Commodity Group: Importance:	29 AG Silver Metallic Silver Primary			Line: Inserted By: Insert Date: Updated By: Update Date:	1 MRDS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:00:29	
I1: Code: Commodity: Commodity Type: Commodity Group: Importance:	29 AU Gold Metallic Gold Primary			Line: Inserted By: Insert Date: Updated By: Update Date:	2 MRDS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:00:29	
I1: Code: Commodity: Commodity Type: Commodity Group: Importance:	29 PB Lead Metallic Lead Primary			Line: Inserted By: Insert Date: Updated By: Update Date:	3 MRDS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:00:29	
I1: Code: Commodity: Commodity Type: Commodity Group: Importance:	21 CU Copper Metallic Copper Primary			Line: Inserted By: Insert Date: Updated By: Update Date:	5 MRDS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:02:42	
I1: Code: Commodity: Commodity Type: Commodity Group: Importance:	29 ZN Zinc Metallic Zinc Primary			Line: Inserted By: Insert Date: Updated By: Update Date:	4 MRDS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:00:29	
<b>Materials</b>						
I1: Material: Ore or Gangue: Rec:	23 Galena Ore 2			Inserted B: Insert Dat: Updated By: Update Dat:	MRDS migration 29-OCT-2002 09:44:3	
I1: Material: Ore or Gangue: Rec:	14 Tetrahedrite Ore 4			Inserted B: Insert Dat: Updated By: Update Dat:	MRDS migration 29-OCT-2002 09:44:3	
I1: Material: Ore or Gangue: Rec:	62 Chalcopyrite Ore 1			Inserted B: Insert Dat: Updated By: Update Dat:	MRDS migration 29-OCT-2002 09:44:3	
I1: Material: Ore or Gangue: Rec:	14 Sphalerite Ore 3			Inserted B: Insert Dat: Updated By: Update Dat:	MRDS migration 29-OCT-2002 09:44:3	
<b>Names</b>						
I1: Status: Site Name: Line:	40 Current Silver Bay Mine 1			Inserted By: Insert Date: Updated By: Update Date:	MRDS migration 29-OCT-02 USGS 29-OCT-02	

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
SILVERTON CO 81433						
Dep ID:	10107859			I1:	47	
Dev Status:	PRODUCER			Latitude:	37.883484	
Code List:	PB			Longitude:	-107.633911	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10107859					
<u>Commodity</u>						
I1:	28			Line:	2	
Code:	ZN			Inserted By:	MRDS migration	
Commodity:	Zinc			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Zinc			Update Date:	29-OCT-2002 09:01:16	
Importance:	Primary					
I1:	28			Line:	3	
Code:	AG			Inserted By:	MRDS migration	
Commodity:	Silver			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Silver			Update Date:	29-OCT-2002 09:01:16	
Importance:	Primary					
I1:	28			Line:	1	
Code:	PB			Inserted By:	MRDS migration	
Commodity:	Lead			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Lead			Update Date:	29-OCT-2002 09:01:16	
Importance:	Primary					
<u>Materials</u>						
I1:	16			Inserted B:	MRDS migration	
Material:	Galena			Insert Dat:	29-OCT-2002 09:44:3	
Ore or Gangue:	Ore			Updated By:		
Rec:	2			Update Dat:		
I1:	19			Inserted B:	MRDS migration	
Material:	Sphalerite			Insert Dat:	29-OCT-2002 09:44:3	
Ore or Gangue:	Ore			Updated By:		
Rec:	3			Update Dat:		
I1:	22			Inserted B:	MRDS migration	
Material:	Chalcopyrite			Insert Dat:	29-OCT-2002 09:44:3	
Ore or Gangue:	Ore			Updated By:		
Rec:	1			Update Dat:		
<u>Names</u>						
I1:	11			Inserted By:	MRDS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Black Hawk, Occidental			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	

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W

0.15 /  
790.43

12,065.54 /  
-59

BLACK HAWK  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

Dep ID: 10018662  
Dev Status: OCCURRENCE  
Code List: PB  
Url: http://mrdata.usgs.gov/mrds/show-mrds.php?dep\_id=10018662

I1: 14  
Latitude: 37.883484  
Longitude: -107.633911



Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b><u>Commodity</u></b>						
<b>I1:</b>	95			<b>Line:</b>	1	
<b>Code:</b>	PB			<b>Inserted By:</b>	MRDS migration	
<b>Commodity:</b>	Lead			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Lead			<b>Update Date:</b>	29-OCT-2002 09:00:34	
<b>Importance:</b>	Primary					
<b>I1:</b>	95			<b>Line:</b>	2	
<b>Code:</b>	ZN			<b>Inserted By:</b>	MRDS migration	
<b>Commodity:</b>	Zinc			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Zinc			<b>Update Date:</b>	29-OCT-2002 09:00:34	
<b>Importance:</b>	Primary					
<b><u>Names</u></b>						
<b>I1:</b>	39			<b>Inserted By:</b>	MRDS migration	
<b>Status:</b>	Current			<b>Insert Date:</b>	29-OCT-02	
<b>Site Name:</b>	Black Hawk			<b>Updated By:</b>	USGS	
<b>Line:</b>	1			<b>Update Date:</b>	29-OCT-02	

<a href="#">19</a>	4 of 4	W	0.15 / 790.43	12,065.54 / -59	MINNEHAHA MINE SAN JUAN COUNTY SILVERTON CO 81433	MRDS
<b>Dep ID:</b>	10107856			<b>I1:</b>	30	
<b>Dev Status:</b>	PRODUCER			<b>Latitude:</b>	37.883484	
<b>Code List:</b>	PB			<b>Longitude:</b>	-107.633911	
<b>Url:</b>	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10107856					

<b><u>Commodity</u></b>						
<b>I1:</b>	28			<b>Line:</b>	3	
<b>Code:</b>	CU			<b>Inserted By:</b>	MRDS migration	
<b>Commodity:</b>	Copper			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Copper			<b>Update Date:</b>	29-OCT-2002 09:01:16	
<b>Importance:</b>	Primary					
<b>I1:</b>	20			<b>Line:</b>	2	
<b>Code:</b>	ZN			<b>Inserted By:</b>	MRDS migration	
<b>Commodity:</b>	Zinc			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Zinc			<b>Update Date:</b>	29-OCT-2002 09:02:46	
<b>Importance:</b>	Primary					
<b>I1:</b>	28			<b>Line:</b>	4	
<b>Code:</b>	AG			<b>Inserted By:</b>	MRDS migration	
<b>Commodity:</b>	Silver			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Silver			<b>Update Date:</b>	29-OCT-2002 09:01:16	
<b>Importance:</b>	Primary					
<b>I1:</b>	28			<b>Line:</b>	1	
<b>Code:</b>	PB			<b>Inserted By:</b>	MRDS migration	
<b>Commodity:</b>	Lead			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Lead			<b>Update Date:</b>	29-OCT-2002 09:01:16	
<b>Importance:</b>	Primary					

**Materials**

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
I1: Material: Ore or Gangue: Rec:	23 Sphalerite Ore 3				Inserted B: Insert Dat: Updated By: Update Dat:	MRDS migration 29-OCT-2002 09:44:3
I1: Material: Ore or Gangue: Rec:	19 Chalcopryrite Ore 1				Inserted B: Insert Dat: Updated By: Update Dat:	MRDS migration 29-OCT-2002 09:44:3
I1: Material: Ore or Gangue: Rec:	19 Galena Ore 2				Inserted B: Insert Dat: Updated By: Update Dat:	MRDS migration 29-OCT-2002 09:44:3
<b><u>Names</u></b>						
I1: Status: Site Name: Line:	32 Current Minnehaha Mine 1				Inserted By: Insert Date: Updated By: Update Date:	MRDS migration 29-OCT-02 USGS 29-OCT-02
<a href="#">20</a>	1 of 1	W	0.14 / 760.91	11,785.56 / -339	MINNEHAHA MINE SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID: Dev Status: Code List: Url:	10018663 OCCURRENCE PB http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10018663			I1: Latitude: Longitude:	14 37.887512 -107.633911	
<b><u>Commodity</u></b>						
I1: Code: Commodity: Commodity Type: Commodity Group: Importance:	96 ZN Zinc Metallic Zinc Primary			Line: Inserted By: Insert Date: Updated By: Update Date:	2 MRDS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:00:34	
I1: Code: Commodity: Commodity Type: Commodity Group: Importance:	96 PB Lead Metallic Lead Primary			Line: Inserted By: Insert Date: Updated By: Update Date:	1 MRDS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:00:34	
<b><u>Names</u></b>						
I1: Status: Site Name: Line:	51 Current Minnehaha Mine 1				Inserted By: Insert Date: Updated By: Update Date:	MRDS migration 29-OCT-02 USGS 29-OCT-02

<a href="#">21</a>	1 of 3	WNW	0.23 / 1,224.15	11,801.64 / -322	TREASURE MTN. GOLD MINING CO. SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID: Dev Status: Code List: Url:	10108249 PRODUCER AU http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10108249			I1: Latitude: Longitude:	26 37.890686 -107.632996	

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b><u>Commodity</u></b>						
I1:	43			Line:	2	
Code:	AG			Inserted By:	MRDS migration	
Commodity:	Silver			Insert Date:	29-OCT-02	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Silver			Update Date:	29-OCT-02	
Importance:	Primary					
I1:	44			Line:	1	
Code:	AU			Inserted By:	MRDS migration	
Commodity:	Gold			Insert Date:	29-OCT-02	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Gold			Update Date:	29-OCT-02	
Importance:	Primary					
I1:	43			Line:	3	
Code:	PB			Inserted By:	MRDS migration	
Commodity:	Lead			Insert Date:	29-OCT-02	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Lead			Update Date:	29-OCT-02	
Importance:	Primary					
I1:	43			Line:	4	
Code:	ZN			Inserted By:	MRDS migration	
Commodity:	Zinc			Insert Date:	29-OCT-02	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Zinc			Update Date:	29-OCT-02	
Importance:	Primary					
I1:	43			Line:	5	
Code:	CU			Inserted By:	MRDS migration	
Commodity:	Copper			Insert Date:	29-OCT-02	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Copper			Update Date:	29-OCT-02	
Importance:	Primary					
<b><u>Materials</u></b>						
I1:	17			Inserted B:	MRDS migration	
Material:	Sphalerite			Insert Dat:	29-OCT-02	
Ore or Gangue:	Ore			Updated By:		
Rec:	5			Update Dat:		
I1:	12			Inserted B:	MRDS migration	
Material:	Tetrahedrite			Insert Dat:	29-OCT-02	
Ore or Gangue:	Ore			Updated By:		
Rec:	6			Update Dat:		
I1:	18			Inserted B:	MRDS migration	
Material:	Rhodonite			Insert Dat:	29-OCT-02	
Ore or Gangue:	Ore			Updated By:		
Rec:	4			Update Dat:		
I1:	17			Inserted B:	MRDS migration	
Material:	Galena			Insert Dat:	29-OCT-02	
Ore or Gangue:	Ore			Updated By:		
Rec:	2			Update Dat:		
I1:	18			Inserted B:	MRDS migration	
Material:	Chalcopyrite			Insert Dat:	29-OCT-02	
Ore or Gangue:	Ore			Updated By:		
Rec:	1			Update Dat:		
I1:	18			Inserted B:	MRDS migration	
Material:	Gold			Insert Dat:	29-OCT-02	
Ore or Gangue:	Ore			Updated By:		

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
Rec:	3			Update Dat:		
<u>Names</u>						
I1:	12			Inserted By:	MRDS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Treasure Mtn. Gold Mining Co.			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	
<a href="#">21</a>	2 of 3	WNW	0.23 / 1,224.15	11,801.64 / -322	PRIDE OF BONITA GROUP SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID:	10018647			I1:	23	
Dev Status:	PRODUCER			Latitude:	37.890686	
Code List:	PB			Longitude:	-107.632996	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10018647					
<u>Commodity</u>						
I1:	39			Line:	1	
Code:	PB			Inserted By:	MRDS migration	
Commodity:	Lead			Insert Date:	29-OCT-02	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Lead			Update Date:	29-OCT-02	
Importance:	Primary					
I1:	39			Line:	2	
Code:	ZN			Inserted By:	MRDS migration	
Commodity:	Zinc			Insert Date:	29-OCT-02	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Zinc			Update Date:	29-OCT-02	
Importance:	Primary					
<u>Names</u>						
I1:	42			Inserted By:	MRDS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Pride of Bonita Group			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	

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3 of 3

WNW

0.23 /  
1,224.15

11,801.64 /  
-322

BURROWS - LITTLE IOLA

SAN JUAN COUNTY

SILVERTON CO 81433

MRDS

Dep ID:

10108450

I1:

19

Dev Status:

PRODUCER

Latitude:

37.890686

Code List:

PB

Longitude:

-107.632996

Url:

http://mrdata.usgs.gov/mrds/show-mrds.php?dep\_id=10108450

Commodity

I1:

43

Line:

2

Code:

ZN

Inserted By:

MRDS migration

Commodity:

Zinc

Insert Date:

29-OCT-02

Commodity Type:

Metallic

Updated By:

USGS

Commodity Group:

Zinc

Update Date:

29-OCT-02

Importance:

Primary

I1:

42

Line:

4

Code:

AG

Inserted By:

MRDS migration

Commodity:

Silver

Insert Date:

29-OCT-02

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<hr/>						
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Silver			<b>Update Date:</b>	29-OCT-02	
<b>Importance:</b>	Primary					
<b>I1:</b>	43			<b>Line:</b>	1	
<b>Code:</b>	PB			<b>Inserted By:</b>	MRDS migration	
<b>Commodity:</b>	Lead			<b>Insert Date:</b>	29-OCT-02	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Lead			<b>Update Date:</b>	29-OCT-02	
<b>Importance:</b>	Primary					
<b>I1:</b>	18			<b>Line:</b>	3	
<b>Code:</b>	AU			<b>Inserted By:</b>	MRDS migration	
<b>Commodity:</b>	Gold			<b>Insert Date:</b>	29-OCT-02	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Gold			<b>Update Date:</b>	29-OCT-02	
<b>Importance:</b>	Primary					
 <b><u>Names</u></b>						
<b>I1:</b>	31			<b>Inserted By:</b>	MRDS migration	
<b>Status:</b>	Current			<b>Insert Date:</b>	29-OCT-02	
<b>Site Name:</b>	Burrows - Little Iola			<b>Updated By:</b>	USGS	
<b>Line:</b>	1			<b>Update Date:</b>	29-OCT-02	
<hr/>						
<a href="#">22</a>	1 of 1	N	0.00 / 0.00	13,169.15 / 1,045	Sunnyside Basin CR 9 Silverton CO 81433	PDES
<b>Permit ID:</b>	COR040060			<b>SW Constr Activity:</b>		
<b>Permit Status:</b>	Admin continued			<b>SW Constr End Date:</b>		
<b>Permit Sector:</b>	Commerce and industry			<b>Permit SIC 1:</b>	1041	
<b>Previous Permit ID:</b>				<b>Permit SIC 2:</b>		
<b>Regulation ID:</b>	34			<b>Permit SIC 3:</b>		
<b>Facility Name:</b>	Sunnyside Basin			<b>Permit SIC 4:</b>		
<b>Facility Address:</b>	CR 9			<b>Permittee:</b>	Sunnyside Gold Corp c/o Kinross Gold USA Inc	
<b>Facility Address 2:</b>				<b>Former Permittee:</b>		
<b>Facility City:</b>	Silverton			<b>Activity Desc:</b>	Reclamation of historic mining, mining subsidence, and open pit mining for gold, silver, lead, copper, and zinc.	
<b>Facility State:</b>	CO			<b>Issue Date:</b>	10/1/2006	
<b>Facility ZIP:</b>	81433			<b>Effective Date:</b>	10/1/2006	
<b>Facility County:</b>	San Juan			<b>Expiration Date:</b>	9/30/2011	
<b>Facility Latitude:</b>	37.9042			<b>Permit Sector1:</b>		
<b>Facility Longitude:</b>	-107.608333			<b>Permit Sector2:</b>		
<b>Facility SIC Code:</b>	1041			<b>Use category:</b>		
<b>Facility Type:</b>				<b>Termination Date:</b>		
<b>Water Category:</b>				<b>Issuing Org Type:</b>	ST6	
<b>Immediate Water:</b>	Unnamed tributary			<b>App Received Date:</b>	8/8/2011	
<b>Receiving Water:</b>	Lake Emma			<b>Ct Status Start Date:</b>		
<b>Stream Segment:</b>	COSJAF02			<b>Ct Status End Date:</b>		
<b>Fee Category:</b>	V-G			<b>Ct Status Reason:</b>		
<b>Add Fee Category 1:</b>				<b>Workplan Year:</b>		
<b>Add Fee Category 2:</b>				<b>UDF3:</b>		
<b>Add Fee Category 3:</b>						
<b>General Permit Type:</b>	COR040000-Metal mining stormwater					
<b>Compliance Tracking Status:</b>	Y					
<b>SW Constr Start Date:</b>						
<b>Reuse Treater:</b>						
<b>Facility Class First:</b>						
<b>Facility Description:</b>						
<b>Fac Horizontal Coll. Method:</b>						
<b>Facility ICIS Ownership Type:</b>						
<b>Associated Pot W:</b>						
<b>SW Constr Total Acres:</b>						
<b>Reuse Treater ID:</b>						
<b>SW Constr Disturb Acres:</b>						



Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
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**Facility Class Second:**  
**Facility Reference Point:**  
**Major Minor:**  
**Major River Basin:** San Juan river and Dolores river basins  
**Total App on Average Flow No:**  
**Total App Design Flow No:**  
**Apprvd for Eltrnc Sub:** Yes

#### Facility Contact

**Facility Contact Org:** Sunnyside Gold Corp  
**Facility Contact First Name:** Larry  
**Facility Contact Last Name:** Perino  
**Facility Contact Title:** Reclamation Mgr  
**Facility Contact Address:** PO Box 177  
**Facility Contact City:** Silverton  
**Facility Contact State:** CO  
**Facility Contact ZIP code:** 81433  
**Facility Contact Phone:** 208-583-2511  
**Facility Contact Email:** larry.perino@kinross.com

#### Billing

**Billing Organization:** Kinross Gold USA Inc  
**Billing First Name:** Maragaret  
**Billing Last Name:** Sams  
**Billing Title:** AP Specialist  
**Billing Address:** 5075 S Syracuse St Ste 800  
**Billing City:** Denver  
**Billing State:** CO  
**Billing ZIP Code:** 80237  
**Billing Phone:** 303-802-1451  
**Billing Email:** margaret.sams@kinross.com  
**Billing Country:** USA

#### DMR

**DMR Org:** Sunnyside Gold Corp  
**DMR First Name:** Larry  
**DMR Last Name:** Perino  
**DMR Title:** Reclamation Mgr  
**DMR Address:** PO Box 177  
**DMR City:** Silverton  
**DMR State:** CO  
**DMR ZIP Code:** 81433  
**DMR Phone:** 208-583-2511  
**DMR Email:** larry.perino@kinross.com  
**DMR Country:** USA

#### Legal

**Legal First Name:** Jim  
**Legal Last Name:** Fowler  
**Legal Title:** VP North America  
**Legal Address:** 5075 S Syracuse St Ste 800  
**Legal City:** Denver  
**Legal State:** CO  
**Legal ZIP Code:** 80237  
**Legal Phone:** 303-802-1451  
**Legal Email:** jim.fowler@kinross.com  
**Legal Country:** USA

#### Other

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Other Org:</b> Kinross Gold USA Inc <b>Other First Name:</b> Steve <b>Other Last Name:</b> Smith <b>Other Title:</b> Env Reclamation Unit Mgr <b>Other Address:</b> 5075 S Syracuse St Ste 800 <b>Other City:</b> Denver <b>Other State:</b> CO <b>Other ZIP Code:</b> 80237 <b>Other Phone:</b> 208-850-7394 <b>Other Email:</b> steve.smith@kinross.com						

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1 of 1

N

0.00 /  
0.00

13,070.27 /  
946

**GOLD PRINCE**  
**SAN JUAN COUNTY**  
**SILVERTON CO 81433**

MRDS

**Dep ID:** 10289152  
**Dev Status:** PAST PRODUCER  
**Code List:** MN  
**Url:** [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10289152](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10289152)

**I1:** 20  
**Latitude:** 37.90448  
**Longitude:** -107.607483

#### Commodity

**I1:** 10  
**Code:** MN  
**Commodity:** Manganese  
**Commodity Type:** Metallic  
**Commodity Group:** Manganese  
**Importance:** Tertiary

**Line:** 1  
**Inserted By:** MAS migration  
**Insert Date:** 29-OCT-2002 09:00:24  
**Updated By:** USGS  
**Update Date:** 29-OCT-2002 09:02:30

#### Names

**I1:** 24  
**Status:** Current  
**Site Name:** Gold Prince  
**Line:** 2

**Inserted By:** MAS migration  
**Insert Date:** 29-OCT-02  
**Updated By:** USGS  
**Update Date:** 29-OCT-02

[24](#)

1 of 1

N

0.00 /  
0.00

12,713.94 /  
590

**NO NAME**  
**SAN JUAN COUNTY**  
**SILVERTON CO 81433**

MRDS

**Dep ID:** 10167197  
**Dev Status:** PAST PRODUCER  
**Code List:** AU PB  
**Url:** [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10167197](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10167197)

**I1:** 26  
**Latitude:** 37.90448  
**Longitude:** -107.610901

#### Commodity

**I1:** 34  
**Code:** AG  
**Commodity:** Silver  
**Commodity Type:** Metallic  
**Commodity Group:** Silver  
**Importance:** Tertiary

**Line:** 3  
**Inserted By:** MAS migration  
**Insert Date:** 29-OCT-2002 09:00:24  
**Updated By:** USGS  
**Update Date:** 29-OCT-2002 09:01:39

**I1:** 84  
**Code:** ZN  
**Commodity:** Zinc  
**Commodity Type:** Metallic  
**Commodity Group:** Zinc  
**Importance:** Tertiary

**Line:** 4  
**Inserted By:** MAS migration  
**Insert Date:** 29-OCT-2002 09:00:24  
**Updated By:** USGS  
**Update Date:** 29-OCT-2002 09:02:38

**I1:** 34  
**Code:** PB

**Line:** 2  
**Inserted By:** MAS migration

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Commodity:</b>	Lead			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Lead			<b>Update Date:</b>	29-OCT-2002 09:01:39	
<b>Importance:</b>	Tertiary					
<b>I1:</b>	34			<b>Line:</b>	1	
<b>Code:</b>	AU			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Gold			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Gold			<b>Update Date:</b>	29-OCT-2002 09:01:39	
<b>Importance:</b>	Primary					
<b><u>Names</u></b>						
<b>I1:</b>	24			<b>Inserted By:</b>	MAS migration	
<b>Status:</b>	Current			<b>Insert Date:</b>	29-OCT-02	
<b>Site Name:</b>	No Name			<b>Updated By:</b>	USGS	
<b>Line:</b>	1			<b>Update Date:</b>	29-OCT-02	

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1 of 1

ESE

0.00 /  
0.00

12,242.35 /  
118

**BONITA PEAK MINING DISTRICT;  
BONITA PEAK MINING DISTRICT  
Multiple sources near Animas  
River headwaters; Multiple  
sources near Animas River  
headwaters  
UNINCORPORATED CO 81433**

NPL

**EPA ID:** CON000802497  
**SITE ID:**  
**Street Addr Txt (Shapefile):** Multiple sources near Animas River headwaters; Multiple sources near Animas River headwaters  
**City Name (Shapefile):** UNINCORPORATED  
**State Code (Shapefile):** CO  
**Zip Code (Shapefile):** 81433  
**County (Shapefile):** SAN JUAN  
**Data Source:** U.S. EPA Site Boundaries Shapefile Download; U.S. EPA Site Feature Polygon Super Fund Shapefile Download

**NPL (SEMS FOIA 004)**

**Final Date:** 09/09/16  
**Federal Facility:** No  
**NAI:** Yes  
**SAA (Superfund Alt.):**  
**NA Entity (NAI Status):** Southern Ute Indian Tribe of the Southern Ute Reservation, Colorado (Current)  
**County:** SAN JUAN  
**Latitude:** +37.904037  
**Longitude:** -107.616630

**NPL Status Information (EPA's Where You Live Map)**

**Status:** NPL Site  
**SITS ID:** 1914  
**Proposed Date:** 04/07/2016  
**Construction Completion No:** 0  
**Construction Completion:**  
**Notice of Data Availability:**  
**Site Listing Narrative:** <a href="https://semspub.epa.gov/src/document/08/1570792" target="\_blank">CON000802497 (PDF)</a>  
**Site Progress Profile:** <a href="https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0802497" target="\_blank">Bonita Peak Mining District</a>  
**Proposed Fr Notice:** <a href="http://www.gpo.gov/fdsys/pkg/FR-2016-04-07/pdf/2016-07671.pdf" target="\_blank">04/07/2016 (PDF)</a>  
**Listing Fr Notice:** <a href="http://www.gpo.gov/fdsys/pkg/FR-2016-09-09/pdf/2016-21615.pdf" target="\_blank">09/09/2016 (PDF)</a>  
**NOID Fr Notice:**  
**Deletion Fr Notice:**  
**Restoration Fr Notice:**  
**Site Had a Partial Deletion:** No  
**Listing Date:** 09/09/2016  
**NOID Date:**  
**Deletion Date:**

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
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#### NPL (EPA Boundaries)

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Bandora Mine-05.jpg	<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>		<b>Region Code:</b>	8
<b>Gis Area:</b>	.05542022	<b>Shape Length:</b>	.00063644
<b>Gis Area U:</b>	Acres	<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28	<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM		
<b>Federal Facility Deter Code:</b>	N		
<b>Site Feature:</b>	Other		
<b>Site Feature 1:</b>	Mine Waste Pile		
<b>Site Feature 2:</b>			
<b>Site Feature 3:</b>	1		
<b>Site Feature 4:</b>	Bandora Mine-05		
<b>Site Feature 5:</b>			
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8		

#### NPL (EPA Boundaries)

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Forest Queen Mine-01.jpg	<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>		<b>Region Code:</b>	8
<b>Gis Area:</b>	.15737922	<b>Shape Length:</b>	.00101788
<b>Gis Area U:</b>	Acres	<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28	<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM		
<b>Federal Facility Deter Code:</b>	N		
<b>Site Feature:</b>	Other		
<b>Site Feature 1:</b>	Mine Waste Pile		
<b>Site Feature 2:</b>			
<b>Site Feature 3:</b>	1		
<b>Site Feature 4:</b>	Forest Queen Mine-01		
<b>Site Feature 5:</b>			
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8		

#### NPL (EPA Boundaries)

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Paradise Mine-02.jpg	<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>		<b>Region Code:</b>	8
<b>Gis Area:</b>	.05691898	<b>Shape Length:</b>	.00078921
<b>Gis Area U:</b>	Acres	<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28	<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM		
<b>Federal Facility Deter Code:</b>	N		
<b>Site Feature:</b>	Other		
<b>Site Feature 1:</b>	Mine Waste Pile		
<b>Site Feature 2:</b>			
<b>Site Feature 3:</b>	1		
<b>Site Feature 4:</b>	Paradise Mine-02		
<b>Site Feature 5:</b>			
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8		

#### NPL (EPA Boundaries)

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
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<b>Epa Program:</b>	Superfund Remedial				<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y				<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Yukon Tunnel-Gold Hub-03.jpg				<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>					<b>Region Code:</b>	8
<b>Gis Area:</b>	.35504538				<b>Shape Length:</b>	.00166527
<b>Gis Area U:</b>	Acres				<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28				<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM					
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Mine Waste Pile					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	Yukon Tunnel/Gold Hub Mine-03					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					

#### NPL (EPA Boundaries)

<b>Epa Program:</b>	Superfund Remedial				<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y				<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Ben Franklin Mine-01.jpg				<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>					<b>Region Code:</b>	8
<b>Gis Area:</b>	1.92815101				<b>Shape Length:</b>	.00545728
<b>Gis Area U:</b>	Acres				<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28				<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM					
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Mine Waste Pile					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	Ben Franklin Mine-01					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					

#### NPL (EPA Boundaries)

<b>Epa Program:</b>	Superfund Remedial				<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y				<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Clipper Mine-03.jpg				<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>					<b>Region Code:</b>	8
<b>Gis Area:</b>	.01999898				<b>Shape Length:</b>	.0003416
<b>Gis Area U:</b>	Acres				<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28				<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM					
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Mine Waste Pile					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	Clipper Mine-03					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					

#### NPL (EPA Boundaries)



Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Epa Program:</b>	Superfund Remedial				<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y				<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Sunbank Group Mine-01 Settling Pond 4.jpg				<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>					<b>Region Code:</b>	8
<b>Gis Area:</b>	.02073106				<b>Shape Length:</b>	.00034371
<b>Gis Area U:</b>	Acres				<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28				<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM					
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Settling Pond					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	Sunbank Group Mine-01 Settling Pond 4					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					

#### NPL (EPA Boundaries)

<b>Epa Program:</b>	Superfund Remedial				<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y				<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Sunbank Group Mine-01 Settling Pond 3.jpg				<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>					<b>Region Code:</b>	8
<b>Gis Area:</b>	.10035941				<b>Shape Length:</b>	.00085917
<b>Gis Area U:</b>	Acres				<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28				<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM					
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Settling Pond					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	Sunbank Group Mine-01 Settling Pond 3					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					

#### NPL (EPA Boundaries)

<b>Epa Program:</b>	Superfund Remedial				<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y				<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Sunbank Group Mine-01 Settling Pond 2.jpg				<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>					<b>Region Code:</b>	8
<b>Gis Area:</b>	.05038587				<b>Shape Length:</b>	.00058978
<b>Gis Area U:</b>	Acres				<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28				<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM					
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Settling Pond					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	Sunbank Group Mine-01 Settling Pond 2					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					

#### NPL (EPA Boundaries)

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<hr/>						
<b>Epa Program:</b>	Superfund Remedial				<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y				<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Frisco-Bagley Tunnel-04.jpg				<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>					<b>Region Code:</b>	8
<b>Gis Area:</b>	.36926476				<b>Shape Length:</b>	.00216667
<b>Gis Area U:</b>	Acres				<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28				<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM					
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Mine Waste Pile					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	Frisco/Bagley Tunnel-04					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					
 <b><u>NPL (EPA Boundaries)</u></b>						
<b>Epa Program:</b>	Superfund Remedial				<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y				<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Red Cloud Mine-02.jpg				<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>					<b>Region Code:</b>	8
<b>Gis Area:</b>	.19055443				<b>Shape Length:</b>	.00123413
<b>Gis Area U:</b>	Acres				<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28				<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM					
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Mine Waste Pile					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	Red Cloud Mine-02					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					
 <b><u>NPL (EPA Boundaries)</u></b>						
<b>Epa Program:</b>	Superfund Remedial				<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y				<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Red Cloud Mine-01 Erosion Area 1.jpg				<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>					<b>Region Code:</b>	8
<b>Gis Area:</b>	.02981475				<b>Shape Length:</b>	.00163113
<b>Gis Area U:</b>	Acres				<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28				<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM					
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Erosion Area					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	Red Cloud Mine-01 Erosion Area 1					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					
 <b><u>NPL (EPA Boundaries)</u></b>						
<b>Epa Program:</b>	Superfund Remedial				<b>NPL Status Dt:</b>	F

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Cleared Public Rel:</b>	Y				<b>Original C:</b>	18-NOV-19 12.00.00.000000 AM
<b>Feature In:</b>					<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>					<b>Region Code:</b>	8
<b>Gis Area:</b>	22.85979822				<b>Shape Length:</b>	.04067625
<b>Gis Area U:</b>	Acres				<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	20				<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM					
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Halo Area					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	Brooklyn Mine Halo Area					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					

#### NPL (EPA Boundaries)

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak London Mine-02.jpg	<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>		<b>Region Code:</b>	8
<b>Gis Area:</b>	.41746356	<b>Shape Length:</b>	.00204623
<b>Gis Area U:</b>	Acres	<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28	<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM		
<b>Federal Facility Deter Code:</b>	N		
<b>Site Feature:</b>	Other		
<b>Site Feature 1:</b>	Mine Waste Pile		
<b>Site Feature 2:</b>			
<b>Site Feature 3:</b>	1		
<b>Site Feature 4:</b>	London Mine-02		
<b>Site Feature 5:</b>			
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8		

#### NPL (EPA Boundaries)

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Ben Butler Mine-01 Erosion Area 1.jpg	<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>		<b>Region Code:</b>	8
<b>Gis Area:</b>	.02240966	<b>Shape Length:</b>	.00037988
<b>Gis Area U:</b>	Acres	<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28	<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM		
<b>Federal Facility Deter Code:</b>	N		
<b>Site Feature:</b>	Other		
<b>Site Feature 1:</b>	Erosion Area		
<b>Site Feature 2:</b>			
<b>Site Feature 3:</b>	1		
<b>Site Feature 4:</b>	Ben Butler Mine-01 Erosion Area 1		
<b>Site Feature 5:</b>			
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8		

#### NPL (EPA Boundaries)

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Brooklyn Mine-01.jpg	<b>Primary Telephone:</b>	(303) 312-6664

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<hr/>						
<b>Feature 1:</b>					<b>Region Code:</b>	8
<b>Gis Area:</b>	4.68138727				<b>Shape Length:</b>	.01063657
<b>Gis Area U:</b>	Acres				<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28				<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20	12.00.00.000000	AM			
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Mine Waste Pile					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	Brooklyn Mine-01					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					
 <b><u>NPL (EPA Boundaries)</u></b>						
<b>Epa Program:</b>	Superfund Remedial				<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y				<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Paradise Mine-04.jpg				<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>					<b>Region Code:</b>	8
<b>Gis Area:</b>	.07912027				<b>Shape Length:</b>	.00079942
<b>Gis Area U:</b>	Acres				<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28				<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20	12.00.00.000000	AM			
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Mine Waste Pile					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	Paradise Mine-04					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					
 <b><u>NPL (EPA Boundaries)</u></b>						
<b>Epa Program:</b>	Superfund Remedial				<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y				<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Brooklyn Mine-02.jpg				<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>					<b>Region Code:</b>	8
<b>Gis Area:</b>	1.47145001				<b>Shape Length:</b>	.0081854
<b>Gis Area U:</b>	Acres				<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28				<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20	12.00.00.000000	AM			
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Mine Waste Pile					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	Brooklyn Mine-02					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					
 <b><u>NPL (EPA Boundaries)</u></b>						
<b>Epa Program:</b>	Superfund Remedial				<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y				<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Mountain Queen Mine-01.jpg				<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>					<b>Region Code:</b>	8
<b>Gis Area:</b>	.29522333				<b>Shape Length:</b>	.00154209

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<hr/>						
<b>Gis Area U:</b>	Acres				<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28				<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20	12.00.00.000000	AM			
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Mine Waste Pile					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	Mountain Queen Mine-01					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					
 <b><u>NPL (EPA Boundaries)</u></b>						
<b>Epa Program:</b>	Superfund Remedial				<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y				<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Sunbank Group Mine-01.jpg				<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>					<b>Region Code:</b>	8
<b>Gis Area:</b>	2.82739134				<b>Shape Length:</b>	.00923125
<b>Gis Area U:</b>	Acres				<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28				<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20	12.00.00.000000	AM			
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Mine Waste Pile					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	Sunbank Group Mine-01					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					
 <b><u>NPL (EPA Boundaries)</u></b>						
<b>Epa Program:</b>	Superfund Remedial				<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y				<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Red Cloud Mine-02 Erosion Area.jpg				<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>					<b>Region Code:</b>	8
<b>Gis Area:</b>	.01917732				<b>Shape Length:</b>	.00045495
<b>Gis Area U:</b>	Acres				<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28				<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20	12.00.00.000000	AM			
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Erosion Area					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	Red Cloud Mine-02 Erosion Area					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					
 <b><u>NPL (EPA Boundaries)</u></b>						
<b>Epa Program:</b>	Superfund Remedial				<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y				<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Boston Mine-01.jpg				<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>					<b>Region Code:</b>	8
<b>Gis Area:</b>	.16625121				<b>Shape Length:</b>	.00113971
<b>Gis Area U:</b>	Acres				<b>Site Contact:</b>	Robert Parker



Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
Horiz Collect Meth:	28				Site Contact 2:	parker.robert@epa.gov
Last Changed:	28-APR-20 12.00.00.000000 AM					
Federal Facility Deter Code:	N					
Site Feature:	Other					
Site Feature 1:	Mine Waste Pile					
Site Feature 2:						
Site Feature 3:	1					
Site Feature 4:	Boston Mine-01					
Site Feature 5:						
Site Feature 6:	U.S. Environmental Protection Agency (EPA) - Region 8					

#### NPL (EPA Boundaries)

Epa Program:	Superfund Remedial	NPL Status Dt:	F
Cleared Public Rel:	Y	Original C:	22-MAY-19 12.00.00.000000 AM
Feature In:		Primary Telephone:	(303) 312-6664
Feature 1:		Region Code:	8
Gis Area:	2.09372704	Shape Length:	.00421232
Gis Area U:	Acres	Site Contact:	Robert Parker
Horiz Collect Meth:	19	Site Contact 2:	parker.robert@epa.gov
Last Changed:	28-APR-20 12.00.00.000000 AM		
Federal Facility Deter Code:	N		
Site Feature:	Other		
Site Feature 1:	Mine Waste Pile		
Site Feature 2:			
Site Feature 3:	1		
Site Feature 4:	Silver Ledge Mine-01		
Site Feature 5:			
Site Feature 6:	U.S. Environmental Protection Agency (EPA) - Region 8		

#### NPL (EPA Boundaries)

Epa Program:	Superfund Remedial	NPL Status Dt:	F
Cleared Public Rel:	Y	Original C:	06-SEP-18 12.00.00.000000 AM
Feature In:	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Bandora Mine-04.jpg	Primary Telephone:	(303) 312-6664
Feature 1:		Region Code:	8
Gis Area:	.09785866	Shape Length:	.00099291
Gis Area U:	Acres	Site Contact:	Robert Parker
Horiz Collect Meth:	28	Site Contact 2:	parker.robert@epa.gov
Last Changed:	28-APR-20 12.00.00.000000 AM		
Federal Facility Deter Code:	N		
Site Feature:	Other		
Site Feature 1:	Mine Waste Pile		
Site Feature 2:			
Site Feature 3:	1		
Site Feature 4:	Bandora Mine-04		
Site Feature 5:			
Site Feature 6:	U.S. Environmental Protection Agency (EPA) - Region 8		

#### NPL (EPA Boundaries)

Epa Program:	Superfund Remedial	NPL Status Dt:	F
Cleared Public Rel:	Y	Original C:	06-SEP-18 12.00.00.000000 AM
Feature In:	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Natalie-Occidental Mine-01.jpg	Primary Telephone:	(303) 312-6664
Feature 1:		Region Code:	8
Gis Area:	.77436247	Shape Length:	.00276465
Gis Area U:	Acres	Site Contact:	Robert Parker
Horiz Collect Meth:	28	Site Contact 2:	parker.robert@epa.gov
Last Changed:	28-APR-20 12.00.00.000000 AM		
Federal Facility Deter Code:	N		
Site Feature:	Other		

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
Site Feature 1:		Mine Waste Pile				
Site Feature 2:						
Site Feature 3:		1				
Site Feature 4:		Natalie/Occidental Mine-01				
Site Feature 5:						
Site Feature 6:		U.S. Environmental Protection Agency (EPA) - Region 8				
<b><u>NPL (EPA Boundaries)</u></b>						
Epa Program:	Superfund Remedial			NPL Status Dt:	F	
Cleared Public Rel:	Y			Original C:	06-SEP-18 12.00.00.000000 AM	
Feature In:	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Natalie-Occidental Mine-03.jpg			Primary Telephone:	(303) 312-6664	
Feature 1:				Region Code:	8	
Gis Area:	.08935445			Shape Length:	.00090122	
Gis Area U:	Acres			Site Contact:	Robert Parker	
Horiz Collect Meth:	28			Site Contact 2:	parker.robert@epa.gov	
Last Changed:	28-APR-20 12.00.00.000000 AM					
Federal Facility Deter Code:	N					
Site Feature:	Other					
Site Feature 1:	Mine Waste Pile					
Site Feature 2:						
Site Feature 3:	1					
Site Feature 4:	Natalie/Occidental Mine-03					
Site Feature 5:						
Site Feature 6:	U.S. Environmental Protection Agency (EPA) - Region 8					
<b><u>NPL (EPA Boundaries)</u></b>						
Epa Program:	Superfund Remedial			NPL Status Dt:	F	
Cleared Public Rel:	Y			Original C:	06-SEP-18 12.00.00.000000 AM	
Feature In:	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Natalie-Occidental Mine-04.jpg			Primary Telephone:	(303) 312-6664	
Feature 1:				Region Code:	8	
Gis Area:	.06447675			Shape Length:	.00093198	
Gis Area U:	Acres			Site Contact:	Robert Parker	
Horiz Collect Meth:	28			Site Contact 2:	parker.robert@epa.gov	
Last Changed:	28-APR-20 12.00.00.000000 AM					
Federal Facility Deter Code:	N					
Site Feature:	Other					
Site Feature 1:	Mine Waste Pile					
Site Feature 2:						
Site Feature 3:	1					
Site Feature 4:	Natalie/Occidental Mine-04					
Site Feature 5:						
Site Feature 6:	U.S. Environmental Protection Agency (EPA) - Region 8					
<b><u>NPL (EPA Boundaries)</u></b>						
Epa Program:	Superfund Remedial			NPL Status Dt:	F	
Cleared Public Rel:	Y			Original C:	06-SEP-18 12.00.00.000000 AM	
Feature In:	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Paradise Mine-01.jpg			Primary Telephone:	(303) 312-6664	
Feature 1:				Region Code:	8	
Gis Area:	.18794019			Shape Length:	.00143773	
Gis Area U:	Acres			Site Contact:	Robert Parker	
Horiz Collect Meth:	28			Site Contact 2:	parker.robert@epa.gov	
Last Changed:	28-APR-20 12.00.00.000000 AM					
Federal Facility Deter Code:	N					
Site Feature:	Other					
Site Feature 1:	Mine Waste Pile					

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
Site Feature 2:						
Site Feature 3:		1				
Site Feature 4:		Paradise Mine-01				
Site Feature 5:						
Site Feature 6:		U.S. Environmental Protection Agency (EPA) - Region 8				

#### NPL (EPA Boundaries)

Epa Program:	Superfund Remedial	NPL Status Dt:	F
Cleared Public Rel:	Y	Original C:	06-SEP-18 12.00.00.000000 AM
Feature In:	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Yukon Tunnel-Gold Hub-01.jpg	Primary Telephone:	(303) 312-6664
Feature 1:		Region Code:	8
Gis Area:	.84186181	Shape Length:	.0021798
Gis Area U:	Acres	Site Contact:	Robert Parker
Horiz Collect Meth:	28	Site Contact 2:	parker.robert@epa.gov
Last Changed:	28-APR-20 12.00.00.000000 AM		
Federal Facility Deter Code:	N		
Site Feature:	Other		
Site Feature 1:	Mine Waste Pile		
Site Feature 2:			
Site Feature 3:	1		
Site Feature 4:	Yukon Tunnel/Gold Hub Mine-01		
Site Feature 5:			
Site Feature 6:	U.S. Environmental Protection Agency (EPA) - Region 8		

#### NPL (EPA Boundaries)

Epa Program:	Superfund Remedial	NPL Status Dt:	F
Cleared Public Rel:	Y	Original C:	06-SEP-18 12.00.00.000000 AM
Feature In:	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Yukon Tunnel-Gold Hub-02.jpg	Primary Telephone:	(303) 312-6664
Feature 1:		Region Code:	8
Gis Area:	.73230117	Shape Length:	.00218105
Gis Area U:	Acres	Site Contact:	Robert Parker
Horiz Collect Meth:	28	Site Contact 2:	parker.robert@epa.gov
Last Changed:	28-APR-20 12.00.00.000000 AM		
Federal Facility Deter Code:	N		
Site Feature:	Other		
Site Feature 1:	Mine Waste Pile		
Site Feature 2:			
Site Feature 3:	1		
Site Feature 4:	Yukon Tunnel/Gold Hub Mine-02		
Site Feature 5:			
Site Feature 6:	U.S. Environmental Protection Agency (EPA) - Region 8		

#### NPL (EPA Boundaries)

Epa Program:	Superfund Remedial	NPL Status Dt:	F
Cleared Public Rel:	Y	Original C:	06-SEP-18 12.00.00.000000 AM
Feature In:	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Mammoth Tunnel-01 Settling Pond 1.jpg	Primary Telephone:	(303) 312-6664
Feature 1:		Region Code:	8
Gis Area:	.07602983	Shape Length:	.00069239
Gis Area U:	Acres	Site Contact:	Robert Parker
Horiz Collect Meth:	28	Site Contact 2:	parker.robert@epa.gov
Last Changed:	28-APR-20 12.00.00.000000 AM		
Federal Facility Deter Code:	N		
Site Feature:	Other		
Site Feature 1:	Settling Pond		

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
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Site Feature 2:						
Site Feature 3:		1				
Site Feature 4:		Mammoth Tunnel-01 Settling Pond 1				
Site Feature 5:						
Site Feature 6:		U.S. Environmental Protection Agency (EPA) - Region 8				

#### NPL (EPA Boundaries)

Epa Program:	Superfund Remedial	NPL Status Dt:	F
Cleared Public Rel:	Y	Original C:	06-SEP-18 12.00.00.000000 AM
Feature In:	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Terry Tunnel-01.jpg	Primary Telephone:	(303) 312-6664
Feature 1:		Region Code:	8
Gis Area:	4.06892158	Shape Length:	.00696988
Gis Area U:	Acres	Site Contact:	Robert Parker
Horiz Collect Meth:	28	Site Contact 2:	parker.robert@epa.gov
Last Changed:	28-APR-20 12.00.00.000000 AM		
Federal Facility Deter Code:	N		
Site Feature:	Other		
Site Feature 1:	Reclaimed Mine Waste Pile		
Site Feature 2:			
Site Feature 3:	1		
Site Feature 4:	Terry Tunnel-01		
Site Feature 5:			
Site Feature 6:	U.S. Environmental Protection Agency (EPA) - Region 8		

#### NPL (EPA Boundaries)

Epa Program:	Superfund Remedial	NPL Status Dt:	F
Cleared Public Rel:	Y	Original C:	06-SEP-18 12.00.00.000000 AM
Feature In:	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Koehler Tunnel-01.jpg	Primary Telephone:	(303) 312-6664
Feature 1:		Region Code:	8
Gis Area:	.0827127	Shape Length:	.00090902
Gis Area U:	Acres	Site Contact:	Robert Parker
Horiz Collect Meth:	28	Site Contact 2:	parker.robert@epa.gov
Last Changed:	28-APR-20 12.00.00.000000 AM		
Federal Facility Deter Code:	N		
Site Feature:	Other		
Site Feature 1:	Mine Waste Pile		
Site Feature 2:			
Site Feature 3:	1		
Site Feature 4:	Koehler Tunnel-01		
Site Feature 5:			
Site Feature 6:	U.S. Environmental Protection Agency (EPA) - Region 8		

#### NPL (EPA Boundaries)

Epa Program:	Superfund Remedial	NPL Status Dt:	F
Cleared Public Rel:	Y	Original C:	06-SEP-18 12.00.00.000000 AM
Feature In:	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Grand Mogul Mine-02.jpg	Primary Telephone:	(303) 312-6664
Feature 1:		Region Code:	8
Gis Area:	.41067831	Shape Length:	.00179739
Gis Area U:	Acres	Site Contact:	Robert Parker
Horiz Collect Meth:	28	Site Contact 2:	parker.robert@epa.gov
Last Changed:	28-APR-20 12.00.00.000000 AM		
Federal Facility Deter Code:	N		
Site Feature:	Other		
Site Feature 1:	Mine Waste Pile		
Site Feature 2:			
Site Feature 3:	1		

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
Site Feature 4:		Grand Mogul Mine-02				
Site Feature 5:						
Site Feature 6:		U.S. Environmental Protection Agency (EPA) - Region 8				
<b><u>NPL (EPA Boundaries)</u></b>						
Epa Program:	Superfund Remedial			NPL Status Dt:	F	
Cleared Public Rel:	Y			Original C:	06-SEP-18 12.00.00.000000 AM	
Feature In:	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Grand Mogul Mine-03.jpg			Primary Telephone:	(303) 312-6664	
Feature 1:				Region Code:	8	
Gis Area:	.00493249			Shape Length:	.00018444	
Gis Area U:	Acres			Site Contact:	Robert Parker	
Horiz Collect Meth:	28			Site Contact 2:	parker.robert@epa.gov	
Last Changed:	28-APR-20 12.00.00.000000 AM					
Federal Facility Deter Code:	N					
Site Feature:	Other					
Site Feature 1:	Mine Waste Pile					
Site Feature 2:						
Site Feature 3:	1					
Site Feature 4:	Grand Mogul Mine-03					
Site Feature 5:						
Site Feature 6:	U.S. Environmental Protection Agency (EPA) - Region 8					
<b><u>NPL (EPA Boundaries)</u></b>						
Epa Program:	Superfund Remedial			NPL Status Dt:	F	
Cleared Public Rel:	Y			Original C:	06-SEP-18 12.00.00.000000 AM	
Feature In:	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Grand Mogul Mine-01.jpg			Primary Telephone:	(303) 312-6664	
Feature 1:				Region Code:	8	
Gis Area:	.94972909			Shape Length:	.0032111	
Gis Area U:	Acres			Site Contact:	Robert Parker	
Horiz Collect Meth:	28			Site Contact 2:	parker.robert@epa.gov	
Last Changed:	28-APR-20 12.00.00.000000 AM					
Federal Facility Deter Code:	N					
Site Feature:	Other					
Site Feature 1:	Mine Waste Pile					
Site Feature 2:						
Site Feature 3:	1					
Site Feature 4:	Grand Mogul Mine-01					
Site Feature 5:						
Site Feature 6:	U.S. Environmental Protection Agency (EPA) - Region 8					
<b><u>NPL (EPA Boundaries)</u></b>						
Epa Program:	Superfund Remedial			NPL Status Dt:	F	
Cleared Public Rel:	Y			Original C:	06-SEP-18 12.00.00.000000 AM	
Feature In:	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Vermillion Mine-01 Erosion Area 1.jpg			Primary Telephone:	(303) 312-6664	
Feature 1:				Region Code:	8	
Gis Area:	.05638396			Shape Length:	.00136911	
Gis Area U:	Acres			Site Contact:	Robert Parker	
Horiz Collect Meth:	28			Site Contact 2:	parker.robert@epa.gov	
Last Changed:	28-APR-20 12.00.00.000000 AM					
Federal Facility Deter Code:	N					
Site Feature:	Other					
Site Feature 1:	Erosion Area					
Site Feature 2:						
Site Feature 3:	1					



Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
Site Feature 4:		Vermillion Mine-01 Erosion Area 1				
Site Feature 5:						
Site Feature 6:		U.S. Environmental Protection Agency (EPA) - Region 8				
<b><u>NPL (EPA Boundaries)</u></b>						
Epa Program:	Superfund Remedial			NPL Status Dt:	F	
Cleared Public Rel:	Y			Original C:	06-SEP-18 12.00.00.000000 AM	
Feature In:	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Red Cloud Mine-01.jpg			Primary Telephone:	(303) 312-6664	
Feature 1:				Region Code:	8	
Gis Area:	.3427003			Shape Length:	.00159134	
Gis Area U:	Acres			Site Contact:	Robert Parker	
Horiz Collect Meth:	28			Site Contact 2:	parker.robert@epa.gov	
Last Changed:	28-APR-20 12.00.00.000000 AM					
Federal Facility Deter Code:	N					
Site Feature:	Other					
Site Feature 1:	Mine Waste Pile					
Site Feature 2:						
Site Feature 3:	1					
Site Feature 4:	Red Cloud Mine-01					
Site Feature 5:						
Site Feature 6:	U.S. Environmental Protection Agency (EPA) - Region 8					
<b><u>NPL (EPA Boundaries)</u></b>						
Epa Program:	Superfund Remedial			NPL Status Dt:	F	
Cleared Public Rel:	Y			Original C:	06-SEP-18 12.00.00.000000 AM	
Feature In:	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Red Cloud Mine-01 Erosion Area 2.jpg			Primary Telephone:	(303) 312-6664	
Feature 1:				Region Code:	8	
Gis Area:	.06895834			Shape Length:	.00259742	
Gis Area U:	Acres			Site Contact:	Robert Parker	
Horiz Collect Meth:	28			Site Contact 2:	parker.robert@epa.gov	
Last Changed:	28-APR-20 12.00.00.000000 AM					
Federal Facility Deter Code:	N					
Site Feature:	Other					
Site Feature 1:	Erosion Area					
Site Feature 2:						
Site Feature 3:	1					
Site Feature 4:	Red Cloud Mine-01 Erosion Area 2					
Site Feature 5:						
Site Feature 6:	U.S. Environmental Protection Agency (EPA) - Region 8					
<b><u>NPL (EPA Boundaries)</u></b>						
Epa Program:	Superfund Remedial			NPL Status Dt:	F	
Cleared Public Rel:	Y			Original C:	06-SEP-18 12.00.00.000000 AM	
Feature In:	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak London Mine-01 Erosion Area 2.jpg			Primary Telephone:	(303) 312-6664	
Feature 1:				Region Code:	8	
Gis Area:	.0833053			Shape Length:	.00136076	
Gis Area U:	Acres			Site Contact:	Robert Parker	
Horiz Collect Meth:	28			Site Contact 2:	parker.robert@epa.gov	
Last Changed:	28-APR-20 12.00.00.000000 AM					
Federal Facility Deter Code:	N					
Site Feature:	Other					
Site Feature 1:	Erosion Area					
Site Feature 2:						
Site Feature 3:	1					
Site Feature 4:	London Mine-01 Erosion Area 2					

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>						
U.S. Environmental Protection Agency (EPA) - Region 8						
<b><u>NPL (EPA Boundaries)</u></b>						
<b>Epa Program:</b>	Superfund Remedial			<b>NPL Status Dt:</b>	F	
<b>Cleared Public Rel:</b>	Y			<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM	
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Ben Butler Mine-03.jpg			<b>Primary Telephone:</b>	(303) 312-6664	
<b>Feature 1:</b>				<b>Region Code:</b>	8	
<b>Gis Area:</b>	.11374314			<b>Shape Length:</b>	.00125948	
<b>Gis Area U:</b>	Acres			<b>Site Contact:</b>	Robert Parker	
<b>Horiz Collect Meth:</b>	28			<b>Site Contact 2:</b>	parker.robert@epa.gov	
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM					
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Mine Waste Pile					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	Ben Butler Mine-03					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					
<b><u>NPL (EPA Boundaries)</u></b>						
<b>Epa Program:</b>	Superfund Remedial			<b>NPL Status Dt:</b>	F	
<b>Cleared Public Rel:</b>	Y			<b>Original C:</b>	22-MAY-19 12.00.00.000000 AM	
<b>Feature In:</b>				<b>Primary Telephone:</b>	(303) 312-6664	
<b>Feature 1:</b>				<b>Region Code:</b>	8	
<b>Gis Area:</b>	.25249319			<b>Shape Length:</b>	.0013863	
<b>Gis Area U:</b>	Acres			<b>Site Contact:</b>	Robert Parker	
<b>Horiz Collect Meth:</b>	19			<b>Site Contact 2:</b>	parker.robert@epa.gov	
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM					
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Mine Waste Pile					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	Wynona Mine-01					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					
<b><u>NPL (EPA Boundaries)</u></b>						
<b>Epa Program:</b>	Superfund Remedial			<b>NPL Status Dt:</b>	F	
<b>Cleared Public Rel:</b>	Y			<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM	
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Bandora Mine-03.jpg			<b>Primary Telephone:</b>	(303) 312-6664	
<b>Feature 1:</b>				<b>Region Code:</b>	8	
<b>Gis Area:</b>	.13668668			<b>Shape Length:</b>	.00087883	
<b>Gis Area U:</b>	Acres			<b>Site Contact:</b>	Robert Parker	
<b>Horiz Collect Meth:</b>	28			<b>Site Contact 2:</b>	parker.robert@epa.gov	
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM					
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Mine Waste Pile					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	Bandora Mine-03					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b><u>NPL (EPA Boundaries)</u></b>						
<b>Epa Program:</b>	Superfund Remedial				<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y				<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Tom Moore Mine-01.jpg				<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>					<b>Region Code:</b>	8
<b>Gis Area:</b>	.3508043				<b>Shape Length:</b>	.00208448
<b>Gis Area U:</b>	Acres				<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28				<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM					
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Mine Waste Pile					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	Tom Moore Mine-01					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					
<b><u>NPL (EPA Boundaries)</u></b>						
<b>Epa Program:</b>	Superfund Remedial				<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y				<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Henrietta Mine-01.jpg				<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>					<b>Region Code:</b>	8
<b>Gis Area:</b>	1.95570291				<b>Shape Length:</b>	.00497554
<b>Gis Area U:</b>	Acres				<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28				<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM					
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Mine Waste Pile					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	Henrietta Mine-01					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					
<b><u>NPL (EPA Boundaries)</u></b>						
<b>Epa Program:</b>	Superfund Remedial				<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y				<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Joe and Johns Mine-02.jpg				<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>					<b>Region Code:</b>	8
<b>Gis Area:</b>	.19119584				<b>Shape Length:</b>	.00123005
<b>Gis Area U:</b>	Acres				<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28				<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM					
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Mine Waste Pile					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	Joe and Johns Mine-02					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					
<b><u>NPL (EPA Boundaries)</u></b>						

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
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<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Gold King Mine-01.jpg	<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>		<b>Region Code:</b>	8
<b>Gis Area:</b>	3.53465426	<b>Shape Length:</b>	.00732849
<b>Gis Area U:</b>	Acres	<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28	<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM		
<b>Federal Facility Deter Code:</b>	N		
<b>Site Feature:</b>	Other		
<b>Site Feature 1:</b>	Mine Waste Pile		
<b>Site Feature 2:</b>			
<b>Site Feature 3:</b>	1		
<b>Site Feature 4:</b>	Gold King Mine-01		
<b>Site Feature 5:</b>			
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8		

#### NPL (EPA Boundaries)

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Red and Bonita Mine-01 Erosion Area.jpg	<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>		<b>Region Code:</b>	8
<b>Gis Area:</b>	2.63971893	<b>Shape Length:</b>	.00556708
<b>Gis Area U:</b>	Acres	<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28	<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM		
<b>Federal Facility Deter Code:</b>	N		
<b>Site Feature:</b>	Other		
<b>Site Feature 1:</b>	Erosion Area		
<b>Site Feature 2:</b>			
<b>Site Feature 3:</b>	1		
<b>Site Feature 4:</b>	Red and Bonita Mine-01 Erosion Area		
<b>Site Feature 5:</b>			
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8		

#### NPL (EPA Boundaries)

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Sunnyside Mine-03.jpg	<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>		<b>Region Code:</b>	8
<b>Gis Area:</b>	.31579204	<b>Shape Length:</b>	.00195755
<b>Gis Area U:</b>	Acres	<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28	<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM		
<b>Federal Facility Deter Code:</b>	N		
<b>Site Feature:</b>	Other		
<b>Site Feature 1:</b>	Mine Waste Pile		
<b>Site Feature 2:</b>			
<b>Site Feature 3:</b>	1		
<b>Site Feature 4:</b>	Sunnyside Mine-03		
<b>Site Feature 5:</b>			
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8		

#### NPL (EPA Boundaries)

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
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Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Cleared Public Rel:</b>	Y				<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>					<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>					<b>Region Code:</b>	8
<b>Gis Area:</b>	.37907285				<b>Shape Length:</b>	.00199204
<b>Gis Area U:</b>	Acres				<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28				<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20	12.00.00.000000 AM				
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Erosion Area					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	Mogul Mine-01 Erosion Area					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					

#### NPL (EPA Boundaries)

<b>Epa Program:</b>	Superfund Remedial				<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y				<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Dewitt Mine-01.jpg				<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>					<b>Region Code:</b>	8
<b>Gis Area:</b>	.03842885				<b>Shape Length:</b>	.00062196
<b>Gis Area U:</b>	Acres				<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28				<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20	12.00.00.000000 AM				
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Mine Waste Pile					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	Dewitt Mine-01					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					

#### NPL (EPA Boundaries)

<b>Epa Program:</b>	Superfund Remedial				<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y				<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak London Mine-01 Erosion Area 1.jpg				<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>					<b>Region Code:</b>	8
<b>Gis Area:</b>	.00356447				<b>Shape Length:</b>	.00020195
<b>Gis Area U:</b>	Acres				<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28				<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20	12.00.00.000000 AM				
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Erosion Area					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	London Mine-01 Erosion Area 1					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					

#### NPL (EPA Boundaries)

<b>Epa Program:</b>	Superfund Remedial				<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y				<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Frisco-Bagley Tunnel-				<b>Primary Telephone:</b>	(303) 312-6664



Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<hr/>						
Feature 1:	01.jpg					
Gis Area:	1.03659906				Region Code:	8
Gis Area U:	Acres				Shape Length:	.00281167
Horiz Collect Meth:	28				Site Contact:	Robert Parker
Last Changed:	28-APR-20 12.00.00.000000 AM				Site Contact 2:	parker.robert@epa.gov
Federal Facility Deter Code:	N					
Site Feature:	Other					
Site Feature 1:	Mine Waste Pile					
Site Feature 2:						
Site Feature 3:	1					
Site Feature 4:	Frisco/Bagley Tunnel-01					
Site Feature 5:						
Site Feature 6:	U.S. Environmental Protection Agency (EPA) - Region 8					
 <b><u>NPL (EPA Boundaries)</u></b>						
Epa Program:	Superfund Remedial				NPL Status Dt:	F
Cleared Public Rel:	Y				Original C:	06-SEP-18 12.00.00.000000 AM
Feature In:	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Frisco-Bagley Tunnel-03 Erosion Area.jpg				Primary Telephone:	(303) 312-6664
Feature 1:					Region Code:	8
Gis Area:	.29644939				Shape Length:	.00159987
Gis Area U:	Acres				Site Contact:	Robert Parker
Horiz Collect Meth:	28				Site Contact 2:	parker.robert@epa.gov
Last Changed:	28-APR-20 12.00.00.000000 AM					
Federal Facility Deter Code:	N					
Site Feature:	Other					
Site Feature 1:	Erosion Area					
Site Feature 2:						
Site Feature 3:	1					
Site Feature 4:	Frisco/Bagley Tunnel-03 Erosion Area					
Site Feature 5:						
Site Feature 6:	U.S. Environmental Protection Agency (EPA) - Region 8					
 <b><u>NPL (EPA Boundaries)</u></b>						
Epa Program:	Superfund Remedial				NPL Status Dt:	F
Cleared Public Rel:	Y				Original C:	18-NOV-19 12.00.00.000000 AM
Feature In:					Primary Telephone:	(303) 312-6664
Feature 1:					Region Code:	8
Gis Area:	6.13878381				Shape Length:	.01756184
Gis Area U:	Acres				Site Contact:	Robert Parker
Horiz Collect Meth:	20				Site Contact 2:	parker.robert@epa.gov
Last Changed:	28-APR-20 12.00.00.000000 AM					
Federal Facility Deter Code:	N					
Site Feature:	Other					
Site Feature 1:	Halo Area					
Site Feature 2:						
Site Feature 3:	1					
Site Feature 4:	Bandora Mine Halo Area					
Site Feature 5:						
Site Feature 6:	U.S. Environmental Protection Agency (EPA) - Region 8					
 <b><u>NPL (EPA Boundaries)</u></b>						
Epa Program:	Superfund Remedial				NPL Status Dt:	F
Cleared Public Rel:	Y				Original C:	18-NOV-19 12.00.00.000000 AM
Feature In:					Primary Telephone:	(303) 312-6664
Feature 1:					Region Code:	8
Gis Area:	22.72652491				Shape Length:	.02058013
Gis Area U:	Acres				Site Contact:	Robert Parker
Horiz Collect Meth:	20				Site Contact 2:	parker.robert@epa.gov
Last Changed:	28-APR-20 12.00.00.000000 AM					

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Federal Facility Deter Code:</b>		N				
<b>Site Feature:</b>		Other				
<b>Site Feature 1:</b>		Halo Area				
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>		1				
<b>Site Feature 4:</b>		Mogul Mine Halo Area				
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>		U.S. Environmental Protection Agency (EPA) - Region 8				

#### NPL (EPA Boundaries)

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	18-NOV-19 12.00.00.000000 AM
<b>Feature In:</b>		<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>		<b>Region Code:</b>	8
<b>Gis Area:</b>	6.46402559	<b>Shape Length:</b>	.01243425
<b>Gis Area U:</b>	Acres	<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	20	<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM		
<b>Federal Facility Deter Code:</b>			
		N	
<b>Site Feature:</b>		Other	
<b>Site Feature 1:</b>		Halo Area	
<b>Site Feature 2:</b>			
<b>Site Feature 3:</b>		1	
<b>Site Feature 4:</b>		London Mine Halo Area	
<b>Site Feature 5:</b>			
<b>Site Feature 6:</b>		U.S. Environmental Protection Agency (EPA) - Region 8	

#### NPL (EPA Boundaries)

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Paradise Mine-03.jpg	<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>		<b>Region Code:</b>	8
<b>Gis Area:</b>	.02438456	<b>Shape Length:</b>	.00045619
<b>Gis Area U:</b>	Acres	<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28	<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM		
<b>Federal Facility Deter Code:</b>			
		N	
<b>Site Feature:</b>		Other	
<b>Site Feature 1:</b>		Mine Waste Pile	
<b>Site Feature 2:</b>			
<b>Site Feature 3:</b>		1	
<b>Site Feature 4:</b>		Paradise Mine-03	
<b>Site Feature 5:</b>			
<b>Site Feature 6:</b>		U.S. Environmental Protection Agency (EPA) - Region 8	

#### NPL (EPA Boundaries)

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Anglo Saxon Mine-02.jpg	<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>		<b>Region Code:</b>	8
<b>Gis Area:</b>	.28531288	<b>Shape Length:</b>	.00147622
<b>Gis Area U:</b>	Acres	<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28	<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM		
<b>Federal Facility Deter Code:</b>			
		N	
<b>Site Feature:</b>		Other	
<b>Site Feature 1:</b>		Mine Waste Pile	
<b>Site Feature 2:</b>			

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
Site Feature 3:		1				
Site Feature 4:		Anglo Saxon Mine-02				
Site Feature 5:						
Site Feature 6:		U.S. Environmental Protection Agency (EPA) - Region 8				
<b><u>NPL (EPA Boundaries)</u></b>						
Epa Program:	Superfund Remedial			NPL Status Dt:	F	
Cleared Public Rel:	Y			Original C:	06-SEP-18 12.00.00.000000 AM	
Feature In:	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Lark Mine-01.jpg			Primary Telephone:	(303) 312-6664	
Feature 1:				Region Code:	8	
Gis Area:	3.7725542			Shape Length:	.00537016	
Gis Area U:	Acres			Site Contact:	Robert Parker	
Horiz Collect Meth:	28			Site Contact 2:	parker.robert@epa.gov	
Last Changed:	28-APR-20 12.00.00.000000 AM					
Federal Facility Deter Code:	N					
Site Feature:	Other					
Site Feature 1:	Mine Waste Pile					
Site Feature 2:						
Site Feature 3:	1					
Site Feature 4:	Lark Mine-01					
Site Feature 5:						
Site Feature 6:	U.S. Environmental Protection Agency (EPA) - Region 8					
<b><u>NPL (EPA Boundaries)</u></b>						
Epa Program:	Superfund Remedial			NPL Status Dt:	F	
Cleared Public Rel:	Y			Original C:	06-SEP-18 12.00.00.000000 AM	
Feature In:	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Ben Franklin Mine-02.jpg			Primary Telephone:	(303) 312-6664	
Feature 1:				Region Code:	8	
Gis Area:	.03728612			Shape Length:	.00051657	
Gis Area U:	Acres			Site Contact:	Robert Parker	
Horiz Collect Meth:	28			Site Contact 2:	parker.robert@epa.gov	
Last Changed:	28-APR-20 12.00.00.000000 AM					
Federal Facility Deter Code:	N					
Site Feature:	Other					
Site Feature 1:	Mine Waste Pile					
Site Feature 2:						
Site Feature 3:	1					
Site Feature 4:	Ben Franklin Mine-02					
Site Feature 5:						
Site Feature 6:	U.S. Environmental Protection Agency (EPA) - Region 8					
<b><u>NPL (EPA Boundaries)</u></b>						
Epa Program:	Superfund Remedial			NPL Status Dt:	F	
Cleared Public Rel:	Y			Original C:	06-SEP-18 12.00.00.000000 AM	
Feature In:	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Pride of the West Mine-01.jpg			Primary Telephone:	(303) 312-6664	
Feature 1:				Region Code:	8	
Gis Area:	.18125991			Shape Length:	.00131892	
Gis Area U:	Acres			Site Contact:	Robert Parker	
Horiz Collect Meth:	28			Site Contact 2:	parker.robert@epa.gov	
Last Changed:	28-APR-20 12.00.00.000000 AM					
Federal Facility Deter Code:	N					
Site Feature:	Other					
Site Feature 1:	Mine Waste Pile					
Site Feature 2:						
Site Feature 3:	1					

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
Site Feature 4:		Pride of the West Mine-01				
Site Feature 5:						
Site Feature 6:		U.S. Environmental Protection Agency (EPA) - Region 8				
<b><u>NPL (EPA Boundaries)</u></b>						
Epa Program:	Superfund Remedial			NPL Status Dt:	F	
Cleared Public Rel:	Y			Original C:	06-SEP-18 12.00.00.000000 AM	
Feature In:	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Mountain Queen Mine-02.jpg			Primary Telephone:	(303) 312-6664	
Feature 1:				Region Code:	8	
Gis Area:	.38108734			Shape Length:	.00162487	
Gis Area U:	Acres			Site Contact:	Robert Parker	
Horiz Collect Meth:	28			Site Contact 2:	parker.robert@epa.gov	
Last Changed:	28-APR-20 12.00.00.000000 AM					
Federal Facility Deter Code:	N					
Site Feature:	Other					
Site Feature 1:	Mine Waste Pile					
Site Feature 2:						
Site Feature 3:	1					
Site Feature 4:	Mountain Queen Mine-02					
Site Feature 5:						
Site Feature 6:	U.S. Environmental Protection Agency (EPA) - Region 8					
<b><u>NPL (EPA Boundaries)</u></b>						
Epa Program:	Superfund Remedial			NPL Status Dt:	F	
Cleared Public Rel:	Y			Original C:	06-SEP-18 12.00.00.000000 AM	
Feature In:	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Sunnyside Mine-02.jpg			Primary Telephone:	(303) 312-6664	
Feature 1:				Region Code:	8	
Gis Area:	.1612713			Shape Length:	.00146547	
Gis Area U:	Acres			Site Contact:	Robert Parker	
Horiz Collect Meth:	28			Site Contact 2:	parker.robert@epa.gov	
Last Changed:	28-APR-20 12.00.00.000000 AM					
Federal Facility Deter Code:	N					
Site Feature:	Other					
Site Feature 1:	Mine Waste Pile					
Site Feature 2:						
Site Feature 3:	1					
Site Feature 4:	Sunnyside Mine-02					
Site Feature 5:						
Site Feature 6:	U.S. Environmental Protection Agency (EPA) - Region 8					
<b><u>NPL (EPA Boundaries)</u></b>						
Epa Program:	Superfund Remedial			NPL Status Dt:	F	
Cleared Public Rel:	Y			Original C:	06-SEP-18 12.00.00.000000 AM	
Feature In:	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Frisco-Bagley Tunnel-03.jpg			Primary Telephone:	(303) 312-6664	
Feature 1:				Region Code:	8	
Gis Area:	.38376427			Shape Length:	.00167065	
Gis Area U:	Acres			Site Contact:	Robert Parker	
Horiz Collect Meth:	28			Site Contact 2:	parker.robert@epa.gov	
Last Changed:	28-APR-20 12.00.00.000000 AM					
Federal Facility Deter Code:	N					
Site Feature:	Other					
Site Feature 1:	Mine Waste Pile					
Site Feature 2:						
Site Feature 3:	1					
Site Feature 4:	Frisco/Bagley Tunnel-03					

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
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Site Feature 5:  
Site Feature 6: U.S. Environmental Protection Agency (EPA) - Region 8

#### NPL (EPA Boundaries)

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Vermillion Mine-01 Erosion Area 2.jpg	<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>		<b>Region Code:</b>	8
<b>Gis Area:</b>	.18242172	<b>Shape Length:</b>	.00413233
<b>Gis Area U:</b>	Acres	<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28	<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM		
<b>Federal Facility Deter Code:</b>	N		
<b>Site Feature:</b>	Other		
<b>Site Feature 1:</b>	Erosion Area		
<b>Site Feature 2:</b>			
<b>Site Feature 3:</b>	1		
<b>Site Feature 4:</b>	Vermillion Mine-01 Erosion Area 2		
<b>Site Feature 5:</b>			
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8		

#### NPL (EPA Boundaries)

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	18-NOV-19 12.00.00.000000 AM
<b>Feature In:</b>		<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>		<b>Region Code:</b>	8
<b>Gis Area:</b>	14.35366662	<b>Shape Length:</b>	.01790079
<b>Gis Area U:</b>	Acres	<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	20	<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM		
<b>Federal Facility Deter Code:</b>	N		
<b>Site Feature:</b>	Other		
<b>Site Feature 1:</b>	Halo Area		
<b>Site Feature 2:</b>			
<b>Site Feature 3:</b>	1		
<b>Site Feature 4:</b>	Lark Mine Halo Area		
<b>Site Feature 5:</b>			
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8		

#### NPL (EPA Boundaries)

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Junction Mine-01.jpg	<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>		<b>Region Code:</b>	8
<b>Gis Area:</b>	.08149927	<b>Shape Length:</b>	.00080857
<b>Gis Area U:</b>	Acres	<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28	<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM		
<b>Federal Facility Deter Code:</b>	N		
<b>Site Feature:</b>	Other		
<b>Site Feature 1:</b>	Mine Waste Pile		
<b>Site Feature 2:</b>			
<b>Site Feature 3:</b>	1		
<b>Site Feature 4:</b>	Junction Mine-01		
<b>Site Feature 5:</b>			
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8		



Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
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#### NPL (EPA Boundaries)

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>		<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>		<b>Region Code:</b>	8
<b>Gis Area:</b>	.05243088	<b>Shape Length:</b>	.00068798
<b>Gis Area U:</b>	Acres	<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28	<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM		
<b>Federal Facility Deter Code:</b>	N		
<b>Site Feature:</b>	Other		
<b>Site Feature 1:</b>	Settling Pond		
<b>Site Feature 2:</b>			
<b>Site Feature 3:</b>	1		
<b>Site Feature 4:</b>	Mountain Queen Mine-01 Settling Pond		
<b>Site Feature 5:</b>			
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8		

#### NPL (EPA Boundaries)

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Sunbank Group Mine-01 Settling Pond 1.jpg	<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>		<b>Region Code:</b>	8
<b>Gis Area:</b>	.06219196	<b>Shape Length:</b>	.00060884
<b>Gis Area U:</b>	Acres	<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28	<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM		
<b>Federal Facility Deter Code:</b>	N		
<b>Site Feature:</b>	Other		
<b>Site Feature 1:</b>	Settling Pond		
<b>Site Feature 2:</b>			
<b>Site Feature 3:</b>	1		
<b>Site Feature 4:</b>	Sunbank Group Mine-01 Settling Pond 1		
<b>Site Feature 5:</b>			
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8		

#### NPL (EPA Boundaries)

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Mogul Mine-03.jpg	<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>		<b>Region Code:</b>	8
<b>Gis Area:</b>	.14262851	<b>Shape Length:</b>	.0009686
<b>Gis Area U:</b>	Acres	<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28	<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM		
<b>Federal Facility Deter Code:</b>	N		
<b>Site Feature:</b>	Other		
<b>Site Feature 1:</b>	Mine Waste Pile		
<b>Site Feature 2:</b>			
<b>Site Feature 3:</b>	1		
<b>Site Feature 4:</b>	Mogul Mine-03		
<b>Site Feature 5:</b>			
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8		

#### NPL (EPA Boundaries)

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
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Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<hr/>						
<b>Cleared Public Rel:</b>	Y				<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Vermillion Mine-01.jpg				<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>					<b>Region Code:</b>	8
<b>Gis Area:</b>	.52007983				<b>Shape Length:</b>	.00200382
<b>Gis Area U:</b>	Acres				<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28				<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM					
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Mine Waste Pile					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	Vermillion Mine-01					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					
 <b><u>NPL (EPA Boundaries)</u></b>						
<b>Epa Program:</b>	Superfund Remedial				<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y				<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Ben Butler Mine-01.jpg				<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>					<b>Region Code:</b>	8
<b>Gis Area:</b>	.2635724				<b>Shape Length:</b>	.00212523
<b>Gis Area U:</b>	Acres				<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28				<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM					
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Mine Waste Pile					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	Ben Butler Mine-01					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					
 <b><u>NPL (EPA Boundaries)</u></b>						
<b>Epa Program:</b>	Superfund Remedial				<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y				<b>Original C:</b>	18-NOV-19 12.00.00.000000 AM
<b>Feature In:</b>					<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>					<b>Region Code:</b>	8
<b>Gis Area:</b>	4.72096125				<b>Shape Length:</b>	.00839624
<b>Gis Area U:</b>	Acres				<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	20				<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM					
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Halo Area					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	Clipper Mine Halo Area					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					
 <b><u>NPL (EPA Boundaries)</u></b>						
<b>Epa Program:</b>	Superfund Remedial				<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y				<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Ben Butler Mine-01 Erosion Area 2.jpg				<b>Primary Telephone:</b>	(303) 312-6664

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Feature 1:</b>					<b>Region Code:</b>	8
<b>Gis Area:</b>	.23291706				<b>Shape Length:</b>	.00146267
<b>Gis Area U:</b>	Acres				<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28				<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20	12.00.00.000000	AM			
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Erosion Area					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	Ben Butler Mine-01 Erosion Area 2					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					

#### NPL (EPA Boundaries)

<b>Epa Program:</b>	Superfund	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	02-NOV-21 12.00.00.000000 AM
<b>Feature In:</b>		<b>Primary Telephone:</b>	(303) 312-6009
<b>Feature 1:</b>		<b>Region Code:</b>	8
<b>Gis Area:</b>	.00717556	<b>Shape Length:</b>	.00019556
<b>Gis Area U:</b>	Acres	<b>Site Contact:</b>	Christina Prograss
<b>Horiz Collect Meth:</b>	21	<b>Site Contact 2:</b>	prograss.christina@epa.gov
<b>Last Changed:</b>	02-NOV-21		
<b>Federal Facility Deter Code:</b>	N		
<b>Site Feature:</b>	Other		
<b>Site Feature 1:</b>	Other		
<b>Site Feature 2:</b>			
<b>Site Feature 3:</b>	1		
<b>Site Feature 4:</b>			
<b>Site Feature 5:</b>	This feature the boundary is a place holder until the site boundary is available to be created		
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - SEMS		

#### NPL (EPA Boundaries)

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Bandora Mine-02.jpg	<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>		<b>Region Code:</b>	8
<b>Gis Area:</b>	.1353696	<b>Shape Length:</b>	.00125877
<b>Gis Area U:</b>	Acres	<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28	<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20		
<b>Federal Facility Deter Code:</b>	N		
<b>Site Feature:</b>	Other		
<b>Site Feature 1:</b>	Mine Waste Pile		
<b>Site Feature 2:</b>			
<b>Site Feature 3:</b>	1		
<b>Site Feature 4:</b>	Bandora Mine-02		
<b>Site Feature 5:</b>			
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8		

#### NPL (EPA Boundaries)

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Bandora Mine-06.jpg	<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>		<b>Region Code:</b>	8
<b>Gis Area:</b>	.12660055	<b>Shape Length:</b>	.00113613
<b>Gis Area U:</b>	Acres	<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28	<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20		

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Federal Facility Deter Code:</b>		N				
<b>Site Feature:</b>		Other				
<b>Site Feature 1:</b>		Mine Waste Pile				
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>		1				
<b>Site Feature 4:</b>		Bandora Mine-06				
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>		U.S. Environmental Protection Agency (EPA) - Region 8				
<b><u>NPL (EPA Boundaries)</u></b>						
<b>Epa Program:</b>		Superfund Remedial			<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>		Y			<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>		https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Anglo Saxon Mine-01.jpg			<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>					<b>Region Code:</b>	8
<b>Gis Area:</b>		.42904059			<b>Shape Length:</b>	.00275518
<b>Gis Area U:</b>		Acres			<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>		28			<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>		28-APR-20 12.00.00.000000 AM				
<b>Federal Facility Deter Code:</b>		N				
<b>Site Feature:</b>		Other				
<b>Site Feature 1:</b>		Mine Waste Pile				
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>		1				
<b>Site Feature 4:</b>		Anglo Saxon Mine-01				
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>		U.S. Environmental Protection Agency (EPA) - Region 8				
<b><u>NPL (EPA Boundaries)</u></b>						
<b>Epa Program:</b>		Superfund Remedial			<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>		Y			<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>		https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Longfellow Mine-01.jpg			<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>					<b>Region Code:</b>	8
<b>Gis Area:</b>		.77270054			<b>Shape Length:</b>	.00262556
<b>Gis Area U:</b>		Acres			<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>		28			<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>		28-APR-20 12.00.00.000000 AM				
<b>Federal Facility Deter Code:</b>		N				
<b>Site Feature:</b>		Other				
<b>Site Feature 1:</b>		Mine Waste Pile				
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>		1				
<b>Site Feature 4:</b>		Longfellow Mine-01				
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>		U.S. Environmental Protection Agency (EPA) - Region 8				
<b><u>NPL (EPA Boundaries)</u></b>						
<b>Epa Program:</b>		Superfund Remedial			<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>		Y			<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>		https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Forest Queen Mine-01 Settling Pond.jpg			<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>					<b>Region Code:</b>	8
<b>Gis Area:</b>		.04734793			<b>Shape Length:</b>	.00053288
<b>Gis Area U:</b>		Acres			<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>		28			<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>		28-APR-20 12.00.00.000000 AM				
<b>Federal Facility Deter Code:</b>		N				

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
Site Feature:		Other				
Site Feature 1:		Settling Pond				
Site Feature 2:						
Site Feature 3:		1				
Site Feature 4:		Forest Queen Mine-01 Settling Pond				
Site Feature 5:						
Site Feature 6:		U.S. Environmental Protection Agency (EPA) - Region 8				
<b><u>NPL (EPA Boundaries)</u></b>						
Epa Program:	Superfund Remedial			NPL Status Dt:	F	
Cleared Public Rel:	Y			Original C:	06-SEP-18 12.00.00.000000 AM	
Feature In:	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Bandora Mine-01.jpg			Primary Telephone:	(303) 312-6664	
Feature 1:				Region Code:	8	
Gis Area:	1.690348			Shape Length:	.00532288	
Gis Area U:	Acres			Site Contact:	Robert Parker	
Horiz Collect Meth:	28			Site Contact 2:	parker.robert@epa.gov	
Last Changed:	28-APR-20 12.00.00.000000 AM					
Federal Facility Deter Code:	N					
Site Feature:	Other					
Site Feature 1:	Mine Waste Pile					
Site Feature 2:						
Site Feature 3:	1					
Site Feature 4:	Bandora Mine-01					
Site Feature 5:						
Site Feature 6:	U.S. Environmental Protection Agency (EPA) - Region 8					
<b><u>NPL (EPA Boundaries)</u></b>						
Epa Program:	Superfund Remedial			NPL Status Dt:	F	
Cleared Public Rel:	Y			Original C:	06-SEP-18 12.00.00.000000 AM	
Feature In:				Primary Telephone:	(303) 312-6664	
Feature 1:				Region Code:	8	
Gis Area:	.0115984			Shape Length:	.00033498	
Gis Area U:	Acres			Site Contact:	Robert Parker	
Horiz Collect Meth:	28			Site Contact 2:	parker.robert@epa.gov	
Last Changed:	28-APR-20 12.00.00.000000 AM					
Federal Facility Deter Code:	N					
Site Feature:	Other					
Site Feature 1:	Erosion Area					
Site Feature 2:						
Site Feature 3:	1					
Site Feature 4:	Paradise Mine-02 Erosion Area					
Site Feature 5:						
Site Feature 6:	U.S. Environmental Protection Agency (EPA) - Region 8					
<b><u>NPL (EPA Boundaries)</u></b>						
Epa Program:	Superfund Remedial			NPL Status Dt:	F	
Cleared Public Rel:	Y			Original C:	06-SEP-18 12.00.00.000000 AM	
Feature In:	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Mammoth Mine-01.jpg			Primary Telephone:	(303) 312-6664	
Feature 1:				Region Code:	8	
Gis Area:	.57278218			Shape Length:	.00219887	
Gis Area U:	Acres			Site Contact:	Robert Parker	
Horiz Collect Meth:	28			Site Contact 2:	parker.robert@epa.gov	
Last Changed:	28-APR-20 12.00.00.000000 AM					
Federal Facility Deter Code:	N					
Site Feature:	Other					
Site Feature 1:	Mine Waste Pile					
Site Feature 2:						
Site Feature 3:	1					
Site Feature 4:	Mammoth Tunnel-01					



Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
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Site Feature 5:  
Site Feature 6: U.S. Environmental Protection Agency (EPA) - Region 8

**NPL (EPA Boundaries)**

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Clipper Mine-01 Erosion Area.jpg	<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>		<b>Region Code:</b>	8
<b>Gis Area:</b>	.26027014	<b>Shape Length:</b>	.00219902
<b>Gis Area U:</b>	Acres	<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28	<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM		
<b>Federal Facility Deter Code:</b>	N		
<b>Site Feature:</b>	Other		
<b>Site Feature 1:</b>	Erosion Area		
<b>Site Feature 2:</b>			
<b>Site Feature 3:</b>	1		
<b>Site Feature 4:</b>	Clipper Mine-01 Erosion Area		
<b>Site Feature 5:</b>			
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8		

**NPL (EPA Boundaries)**

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Clipper Mine-01.jpg	<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>		<b>Region Code:</b>	8
<b>Gis Area:</b>	.18607288	<b>Shape Length:</b>	.0011125
<b>Gis Area U:</b>	Acres	<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28	<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM		
<b>Federal Facility Deter Code:</b>	N		
<b>Site Feature:</b>	Other		
<b>Site Feature 1:</b>	Mine Waste Pile		
<b>Site Feature 2:</b>			
<b>Site Feature 3:</b>	1		
<b>Site Feature 4:</b>	Clipper Mine-01		
<b>Site Feature 5:</b>			
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8		

**NPL (EPA Boundaries)**

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Red and Bonita Mine-01.jpg	<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>		<b>Region Code:</b>	8
<b>Gis Area:</b>	1.21130062	<b>Shape Length:</b>	.00368217
<b>Gis Area U:</b>	Acres	<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28	<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM		
<b>Federal Facility Deter Code:</b>	N		
<b>Site Feature:</b>	Other		
<b>Site Feature 1:</b>	Mine Waste Pile		
<b>Site Feature 2:</b>			
<b>Site Feature 3:</b>	1		
<b>Site Feature 4:</b>	Red and Bonita Mine-01		
<b>Site Feature 5:</b>			

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
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Site Feature 6: U.S. Environmental Protection Agency (EPA) - Region 8

**NPL (EPA Boundaries)**

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Sunnyside Mine-01.jpg	<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>		<b>Region Code:</b>	8
<b>Gis Area:</b>	1.09578673	<b>Shape Length:</b>	.00259085
<b>Gis Area U:</b>	Acres	<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28	<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM		
<b>Federal Facility Deter Code:</b>	N		
<b>Site Feature:</b>	Other		
<b>Site Feature 1:</b>	Mine Waste Pile		
<b>Site Feature 2:</b>			
<b>Site Feature 3:</b>	1		
<b>Site Feature 4:</b>	Sunnyside Mine-01		
<b>Site Feature 5:</b>			
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8		

**NPL (EPA Boundaries)**

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Mogul Mine-01.jpg	<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>		<b>Region Code:</b>	8
<b>Gis Area:</b>	2.19447824	<b>Shape Length:</b>	.00436392
<b>Gis Area U:</b>	Acres	<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28	<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM		
<b>Federal Facility Deter Code:</b>	N		
<b>Site Feature:</b>	Other		
<b>Site Feature 1:</b>	Mine Waste Pile		
<b>Site Feature 2:</b>			
<b>Site Feature 3:</b>	1		
<b>Site Feature 4:</b>	Mogul Mine-01		
<b>Site Feature 5:</b>			
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8		

**NPL (EPA Boundaries)**

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Natalie-Occidental Mine-02.jpg	<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>		<b>Region Code:</b>	8
<b>Gis Area:</b>	.38304132	<b>Shape Length:</b>	.00239894
<b>Gis Area U:</b>	Acres	<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28	<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM		
<b>Federal Facility Deter Code:</b>	N		
<b>Site Feature:</b>	Other		
<b>Site Feature 1:</b>	Mine Waste Pile		
<b>Site Feature 2:</b>			
<b>Site Feature 3:</b>	1		
<b>Site Feature 4:</b>	Natalie/Occidental Mine-02		
<b>Site Feature 5:</b>			
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8		

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
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#### NPL (EPA Boundaries)

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Mammoth Tunnel-01 Settling Pond 2.jpg	<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>		<b>Region Code:</b>	8
<b>Gis Area:</b>	.10658773	<b>Shape Length:</b>	.00079269
<b>Gis Area U:</b>	Acres	<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28	<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM		
<b>Federal Facility Deter Code:</b>	N		
<b>Site Feature:</b>	Other		
<b>Site Feature 1:</b>	Settling Pond		
<b>Site Feature 2:</b>			
<b>Site Feature 3:</b>	1		
<b>Site Feature 4:</b>	Mammoth Tunnel-01 Settling Pond 2		
<b>Site Feature 5:</b>			
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8		

#### NPL (EPA Boundaries)

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Mammoth Tunnel-01 Erosion Area.jpg	<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>		<b>Region Code:</b>	8
<b>Gis Area:</b>	.51083178	<b>Shape Length:</b>	.00236769
<b>Gis Area U:</b>	Acres	<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28	<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM		
<b>Federal Facility Deter Code:</b>	N		
<b>Site Feature:</b>	Other		
<b>Site Feature 1:</b>	Erosion Area		
<b>Site Feature 2:</b>			
<b>Site Feature 3:</b>	1		
<b>Site Feature 4:</b>	Mammoth Tunnel-01 Erosion Area		
<b>Site Feature 5:</b>			
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8		

#### NPL (EPA Boundaries)

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Henrietta Mine-01 Erosion Area.jpg	<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>		<b>Region Code:</b>	8
<b>Gis Area:</b>	.0979031	<b>Shape Length:</b>	.00094042
<b>Gis Area U:</b>	Acres	<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28	<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM		
<b>Federal Facility Deter Code:</b>	N		
<b>Site Feature:</b>	Other		
<b>Site Feature 1:</b>	Erosion Area		
<b>Site Feature 2:</b>			
<b>Site Feature 3:</b>	1		
<b>Site Feature 4:</b>	Henrietta Mine-01 Erosion Area		
<b>Site Feature 5:</b>			
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8		

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
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**NPL (EPA Boundaries)**

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Ben Franklin Mine-03.jpg	<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>		<b>Region Code:</b>	8
<b>Gis Area:</b>	.04036456	<b>Shape Length:</b>	.0005205
<b>Gis Area U:</b>	Acres	<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28	<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM		
<b>Federal Facility Deter Code:</b>	N		
<b>Site Feature:</b>	Other		
<b>Site Feature 1:</b>	Mine Waste Pile		
<b>Site Feature 2:</b>			
<b>Site Feature 3:</b>	1		
<b>Site Feature 4:</b>	Ben Franklin Mine-03		
<b>Site Feature 5:</b>			
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8		

**NPL (EPA Boundaries)**

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Clipper Mine-02.jpg	<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>		<b>Region Code:</b>	8
<b>Gis Area:</b>	.10566932	<b>Shape Length:</b>	.00112863
<b>Gis Area U:</b>	Acres	<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28	<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM		
<b>Federal Facility Deter Code:</b>	N		
<b>Site Feature:</b>	Other		
<b>Site Feature 1:</b>	Mine Waste Pile		
<b>Site Feature 2:</b>			
<b>Site Feature 3:</b>	1		
<b>Site Feature 4:</b>	Clipper Mine-02		
<b>Site Feature 5:</b>			
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8		

**NPL (EPA Boundaries)**

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Silver Wing Mine-01.jpg	<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>		<b>Region Code:</b>	8
<b>Gis Area:</b>	1.58245045	<b>Shape Length:</b>	.00420278
<b>Gis Area U:</b>	Acres	<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28	<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM		
<b>Federal Facility Deter Code:</b>	N		
<b>Site Feature:</b>	Other		
<b>Site Feature 1:</b>	Mine Waste Pile		
<b>Site Feature 2:</b>			
<b>Site Feature 3:</b>	1		
<b>Site Feature 4:</b>	Silverwing Mine-01		
<b>Site Feature 5:</b>			
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8		

**NPL (EPA Boundaries)**

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<hr/>						
<b>Epa Program:</b>	Superfund Remedial			<b>NPL Status Dt:</b>	F	
<b>Cleared Public Rel:</b>	Y			<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM	
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Mogul Mine-02.jpg			<b>Primary Telephone:</b>	(303) 312-6664	
<b>Feature 1:</b>				<b>Region Code:</b>	8	
<b>Gis Area:</b>	.0671859			<b>Shape Length:</b>	.00072964	
<b>Gis Area U:</b>	Acres			<b>Site Contact:</b>	Robert Parker	
<b>Horiz Collect Meth:</b>	28			<b>Site Contact 2:</b>	parker.robert@epa.gov	
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM					
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Mine Waste Pile					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	Mogul Mine-02					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					
 <b><u>NPL (EPA Boundaries)</u></b>						
<b>Epa Program:</b>	Superfund Remedial			<b>NPL Status Dt:</b>	F	
<b>Cleared Public Rel:</b>	Y			<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM	
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Sunbank Group Mine-01 Settling Pond 5.jpg			<b>Primary Telephone:</b>	(303) 312-6664	
<b>Feature 1:</b>				<b>Region Code:</b>	8	
<b>Gis Area:</b>	.02782361			<b>Shape Length:</b>	.00043135	
<b>Gis Area U:</b>	Acres			<b>Site Contact:</b>	Robert Parker	
<b>Horiz Collect Meth:</b>	28			<b>Site Contact 2:</b>	parker.robert@epa.gov	
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM					
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Settling Pond					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	Sunbank Group Mine-01 Settling Pond 5					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					
 <b><u>NPL (EPA Boundaries)</u></b>						
<b>Epa Program:</b>	Superfund Remedial			<b>NPL Status Dt:</b>	F	
<b>Cleared Public Rel:</b>	Y			<b>Original C:</b>	18-NOV-19 12.00.00.000000 AM	
<b>Feature In:</b>				<b>Primary Telephone:</b>	(303) 312-6664	
<b>Feature 1:</b>				<b>Region Code:</b>	8	
<b>Gis Area:</b>	4.91010389			<b>Shape Length:</b>	.0107251	
<b>Gis Area U:</b>	Acres			<b>Site Contact:</b>	Robert Parker	
<b>Horiz Collect Meth:</b>	20			<b>Site Contact 2:</b>	parker.robert@epa.gov	
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM					
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Halo Area					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	Red Cloud and Boston Mine Halo Area					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					
 <b><u>NPL (EPA Boundaries)</u></b>						
<b>Epa Program:</b>	Superfund Remedial			<b>NPL Status Dt:</b>	F	
<b>Cleared Public Rel:</b>	Y			<b>Original C:</b>	22-MAY-19 12.00.00.000000 AM	
<b>Feature In:</b>				<b>Primary Telephone:</b>	(303) 312-6664	



Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<hr/>						
<b>Feature 1:</b>					<b>Region Code:</b>	8
<b>Gis Area:</b>	.59390685				<b>Shape Length:</b>	.00251846
<b>Gis Area U:</b>	Acres				<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	19				<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20	12.00.00.000000	AM			
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Mine Waste Pile					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	Senator Mine-01					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					
 <b><u>NPL (EPA Boundaries)</u></b>						
<b>Epa Program:</b>	Superfund Remedial				<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y				<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Boston Mine-01 Erosion Area.jpg				<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>					<b>Region Code:</b>	8
<b>Gis Area:</b>	.31124642				<b>Shape Length:</b>	.00209177
<b>Gis Area U:</b>	Acres				<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28				<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20	12.00.00.000000	AM			
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Erosion Area					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	Boston Mine-01 Erosion Area					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					
 <b><u>NPL (EPA Boundaries)</u></b>						
<b>Epa Program:</b>	Superfund Remedial				<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y				<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Frisco-Bagley Tunnel-02.jpg				<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>					<b>Region Code:</b>	8
<b>Gis Area:</b>	.3571442				<b>Shape Length:</b>	.00160791
<b>Gis Area U:</b>	Acres				<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28				<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20	12.00.00.000000	AM			
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Mine Waste Pile					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	Frisco/Bagley Tunnel-02					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					
 <b><u>NPL (EPA Boundaries)</u></b>						
<b>Epa Program:</b>	Superfund Remedial				<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y				<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak Columbus Mine-01.jpg				<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>					<b>Region Code:</b>	8

<i>Map Key</i>	<i>Number of Records</i>	<i>Direction</i>	<i>Distance (mi/ft)</i>	<i>Elev/Diff (ft)</i>	<i>Site</i>	<i>DB</i>
<b>Gis Area:</b>	1.30570441				<b>Shape Length:</b>	.00312621
<b>Gis Area U:</b>	Acres				<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28				<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM					
<b>Federal Facility Deter Code:</b>	N					
<b>Site Feature:</b>	Other					
<b>Site Feature 1:</b>	Mine Waste Pile					
<b>Site Feature 2:</b>						
<b>Site Feature 3:</b>	1					
<b>Site Feature 4:</b>	Columbus Mine-01					
<b>Site Feature 5:</b>						
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8					

#### NPL (EPA Boundaries)

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	18-NOV-19 12.00.00.000000 AM
<b>Feature In:</b>		<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>		<b>Region Code:</b>	8
<b>Gis Area:</b>	10.4854827	<b>Shape Length:</b>	.01309195
<b>Gis Area U:</b>	Acres	<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	20	<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM		
<b>Federal Facility Deter Code:</b>	N		
<b>Site Feature:</b>	Other		
<b>Site Feature 1:</b>	Halo Area		
<b>Site Feature 2:</b>			
<b>Site Feature 3:</b>	1		
<b>Site Feature 4:</b>	Vermillion Mine Halo Area		
<b>Site Feature 5:</b>			
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8		

#### NPL (EPA Boundaries)

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	06-SEP-18 12.00.00.000000 AM
<b>Feature In:</b>	https://geopub.epa.gov/R8/Photographs/BonitaPeak/SiteFeatures/Polygons/Bonita Peak London Mine-01.jpg	<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>		<b>Region Code:</b>	8
<b>Gis Area:</b>	.54735339	<b>Shape Length:</b>	.0033488
<b>Gis Area U:</b>	Acres	<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	28	<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM		
<b>Federal Facility Deter Code:</b>	N		
<b>Site Feature:</b>	Other		
<b>Site Feature 1:</b>	Mine Waste Pile		
<b>Site Feature 2:</b>			
<b>Site Feature 3:</b>	1		
<b>Site Feature 4:</b>	London Mine-01		
<b>Site Feature 5:</b>			
<b>Site Feature 6:</b>	U.S. Environmental Protection Agency (EPA) - Region 8		

#### NPL (EPA Boundaries)

<b>Epa Program:</b>	Superfund Remedial	<b>NPL Status Dt:</b>	F
<b>Cleared Public Rel:</b>	Y	<b>Original C:</b>	22-MAY-19 12.00.00.000000 AM
<b>Feature In:</b>		<b>Primary Telephone:</b>	(303) 312-6664
<b>Feature 1:</b>		<b>Region Code:</b>	8
<b>Gis Area:</b>	.19232717	<b>Shape Length:</b>	.00103428
<b>Gis Area U:</b>	Acres	<b>Site Contact:</b>	Robert Parker
<b>Horiz Collect Meth:</b>	19	<b>Site Contact 2:</b>	parker.robert@epa.gov
<b>Last Changed:</b>	28-APR-20 12.00.00.000000 AM		
<b>Federal Facility Deter Code:</b>	N		
<b>Site Feature:</b>	Other		
<b>Site Feature 1:</b>	Mine Waste Pile		

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
Site Feature 2:						
Site Feature 3:		1				
Site Feature 4:		Little Nation Mine-01				
Site Feature 5:						
Site Feature 6:		U.S. Environmental Protection Agency (EPA) - Region 8				

<a href="#">26</a>	1 of 5	NNW	0.00 / 0.00	12,319.32 / 195	<b>BONITA PEAK MINING DISTRICT</b> Multiple sources near Animas River headwaters UNINCORPORATED CO 81433	SEMS
EPA ID:	CON000802497			Pgm Sys ID:	CON000802497	
NPL:				Primary Name(MAP):	BONITA PEAK MINING DISTRICT	
Federal Facility:				Loc Address(MAP):	MULTIPLE SOURCES NEAR ANIMAS RIVER HEADWATERS	
Non NPL Status:				City Name:	UNINCORPORATED	
SuperF Alt Agrmnt:				Postal Code:	81433	
Site Name:	BONITA PEAK MINING DISTRICT			County Name:	SAN JUAN	
Street Address:	Multiple sources near Animas River headwaters			Latitude83:	37.904036999999995	
Street Address 2:				Longitude83:	-107.61663	
City:	UNINCORPORATED			PGM SYS ID:		
State:	CO			Name(CalOES):		
Zip:	81433			Loc Addr(CalOES):		
County:	SAN JUAN			City:		
Latitude:	+37.904037			Postal:		
Longitude:	-107.616630			County:		
Region:				Latitude83:		
Cong District:				Longitude83:		
FIPS Code:						
Data Source:	EPA Superfund Data and Reports Active Site Inventory (List 8R Active); EPA FRS Interests Map - SEMS					

#### Site Level Information

Site ID:	0802497	Superfund Alt Agmt:	No
NPL:	Currently on the Final NPL	FIPS Code:	08111
Federal Facility:	No	Cong District:	03
FF Docket:	No	Region:	08
Non NPL Status:			

#### Action Information

Operable Units:	00	Start Actual:	07/02/2016
Action Code:	TA	Finish Actual:	
Action Name:	TECH ASSIST	Qual:	
SEQ:	1	Curr Action Lead:	EPA Perf
Operable Units:	01	Start Actual:	05/20/2019
Action Code:	RO	Finish Actual:	05/20/2019
Action Name:	ROD	Qual:	
SEQ:	1	Curr Action Lead:	EPA Perf
Operable Units:	00	Start Actual:	07/19/2016
Action Code:	CR	Finish Actual:	
Action Name:	CI	Qual:	
SEQ:	1	Curr Action Lead:	EPA Perf
Operable Units:	00	Start Actual:	07/18/2016
Action Code:	EE	Finish Actual:	01/12/2017
Action Name:	EE/CA	Qual:	
SEQ:	1	Curr Action Lead:	EPA Perf
Operable Units:	01	Start Actual:	09/20/2019
Action Code:	CO	Finish Actual:	04/30/2021
Action Name:	RI/FS	Qual:	
SEQ:	3	Curr Action Lead:	EPA Perf

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
Operable Units:	01			Start Actual:	05/19/2016	
Action Code:	CO			Finish Actual:	05/20/2019	
Action Name:	RI/FS			Qual:		
SEQ:	1			Curr Action Lead:	EPA Perf	
Operable Units:	01			Start Actual:	03/28/2017	
Action Code:	ED			Finish Actual:		
Action Name:	R/H ASMT			Qual:		
SEQ:	1			Curr Action Lead:	EPA Perf	
Operable Units:	03			Start Actual:	05/29/2020	
Action Code:	TA			Finish Actual:	02/05/2021	
Action Name:	TECH ASSIST			Qual:		
SEQ:	3			Curr Action Lead:	EPA Perf	
Operable Units:	00			Start Actual:	07/16/2017	
Action Code:	RV			Finish Actual:		
Action Name:	RMVL			Qual:		
SEQ:	2			Curr Action Lead:	EPA Perf	
Operable Units:	00			Start Actual:	09/09/2016	
Action Code:	NF			Finish Actual:	09/09/2016	
Action Name:	NPL FINL			Qual:		
SEQ:	1			Curr Action Lead:	EPA Perf	
Operable Units:	03			Start Actual:	07/26/2019	
Action Code:	RI			Finish Actual:		
Action Name:	RI			Qual:		
SEQ:	1			Curr Action Lead:	EPA Perf	
Operable Units:	03			Start Actual:	03/08/2021	
Action Code:	RS			Finish Actual:		
Action Name:	RV ASSESS			Qual:		
SEQ:	2			Curr Action Lead:	EPA Perf	
Operable Units:	03			Start Actual:	04/11/2018	
Action Code:	NA			Finish Actual:	07/26/2019	
Action Name:	PRP RI			Qual:		
SEQ:	2			Curr Action Lead:	EPA Ovrsght	
Operable Units:	01			Start Actual:	09/20/2019	
Action Code:	RA			Finish Actual:		
Action Name:	RA			Qual:	IR	
SEQ:	1			Curr Action Lead:	EPA Perf	
Operable Units:	00			Start Actual:	01/12/2017	
Action Code:	RV			Finish Actual:		
Action Name:	RMVL			Qual:		
SEQ:	1			Curr Action Lead:	EPA Perf	
Operable Units:	00			Start Actual:	07/26/1996	
Action Code:	SI			Finish Actual:	07/22/1999	
Action Name:	SI			Qual:	G	
SEQ:	1			Curr Action Lead:	EPA Perf	
Operable Units:	00			Start Actual:	01/24/1996	
Action Code:	DS			Finish Actual:	01/24/1996	
Action Name:	DISCVRY			Qual:		
SEQ:	1			Curr Action Lead:	EPA Perf	
Operable Units:	01			Start Actual:	03/28/2017	
Action Code:	ED			Finish Actual:		
Action Name:	R/H ASMT			Qual:		
SEQ:	2			Curr Action Lead:	EPA Perf	
Operable Units:	01			Start Actual:	04/30/2021	
Action Code:	RO			Finish Actual:	04/30/2021	
Action Name:	ROD			Qual:		

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
SEQ:	2				Curr Action Lead:	EPA Perf
Operable Units:	05				Start Actual:	09/13/2021
Action Code:	BB				Finish Actual:	
Action Name:	PRP RV				Qual:	C
SEQ:	2				Curr Action Lead:	EPA Ovrsght
Operable Units:	00				Start Actual:	10/15/2015
Action Code:	HR				Finish Actual:	04/07/2016
Action Name:	HAZRANK				Qual:	O
SEQ:	1				Curr Action Lead:	EPA Perf
Operable Units:	00				Start Actual:	04/07/2016
Action Code:	NP				Finish Actual:	04/07/2016
Action Name:	PROPOSED				Qual:	
SEQ:	1				Curr Action Lead:	EPA Perf
Operable Units:	01				Start Actual:	06/01/2020
Action Code:	RD				Finish Actual:	
Action Name:	RD				Qual:	
SEQ:	1				Curr Action Lead:	EPA Perf
Operable Units:	01				Start Actual:	09/01/2016
Action Code:	MA				Finish Actual:	
Action Name:	ST COOP				Qual:	
SEQ:	1				Curr Action Lead:	EPA Perf
Operable Units:	01				Start Actual:	09/14/2021
Action Code:	RA				Finish Actual:	
Action Name:	RA				Qual:	
SEQ:	2				Curr Action Lead:	EPA Perf
Operable Units:	04				Start Actual:	09/14/2019
Action Code:	BB				Finish Actual:	
Action Name:	PRP RV				Qual:	C
SEQ:	1				Curr Action Lead:	EPA Ovrsght
Operable Units:	00				Start Actual:	03/26/1998
Action Code:	PA				Finish Actual:	03/26/1998
Action Name:	PA				Qual:	H
SEQ:	1				Curr Action Lead:	EPA Perf
Operable Units:	00				Start Actual:	09/23/2017
Action Code:	RS				Finish Actual:	
Action Name:	RV ASSESS				Qual:	
SEQ:	1				Curr Action Lead:	EPA Perf
Operable Units:	00				Start Actual:	09/07/2018
Action Code:	TA				Finish Actual:	
Action Name:	TECH ASSIST				Qual:	
SEQ:	2				Curr Action Lead:	EPA Perf
Operable Units:	03				Start Actual:	04/09/2019
Action Code:	CO				Finish Actual:	
Action Name:	RI/FS				Qual:	
SEQ:	2				Curr Action Lead:	EPA Perf
Operable Units:	01				Start Actual:	05/26/2020
Action Code:	TS				Finish Actual:	
Action Name:	TRTSTUDY				Qual:	
SEQ:	1				Curr Action Lead:	EPA Perf

#### REST Information

Registry ID:	110070058573	Pgm Sys Acrnm:	SEMS
Active Status:	CURRENTLY ON THE FINAL NPL	Accuracy Value:	
Key Field:	SEMCON000802497	HUC8 Code:	14080104
Interest Type:	SUPERFUND NPL	HUC 12:	



Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<div> <div> <b>Fed Agency Name:</b>  <b>Fed Facility Code:</b>  <b>EPA Region Code:</b> 08  <b>Collect Mth Desc:</b>  <b>Ref Point Desc:</b>  <b>Fac Url:</b>  <b>Program Url:</b>  <b>Pgm Report Url:</b>  <b>Fips Code:</b> </div> <div> <b>Federal Land Ind:</b>  <b>Public Ind:</b> Y  <b>Pgm Report:</b> no data yet </div> <div> <b>Fac Url:</b> https://ofmpub.epa.gov/frs_public2/fii_query_detail.disp_program_facility?p_registry_id=110070058573  <b>Program Url:</b> http://www.epa.gov/superfund/action/law/cercla.htm  <b>Pgm Report Url:</b> no data yet  <b>Fips Code:</b> 08111 </div> </div>						
<a href="#">26</a>	2 of 5	NNW	0.00 / 0.00	12,319.32 / 195	BONITA PEAK MINING DISTRICT MULTIPLE SOURCES NEAR ANIMAS RIVER HEADWATERS UNINCORPORATED CO 81433	FINDS/FRS
<div> <b>Registry ID:</b> 110070058573  <b>FIPS Code:</b> 08111  <b>HUC Code:</b> 14080104  <b>Site Type Name:</b> CONTAMINATED SITE  <b>Location Description:</b>  <b>Supplemental Location:</b> HEADWATERS OF THE ANIMAS RIVER  <b>Create Date:</b> 26-MAY-17  <b>Update Date:</b> 26-MAY-20  <b>Interest Types:</b> SUPERFUND NPL  <b>SIC Codes:</b>  <b>SIC Code Descriptions:</b>  <b>NAICS Codes:</b>  <b>NAICS Code Descriptions:</b>  <b>Conveyor:</b> SEMS  <b>Federal Facility Code:</b>  <b>Federal Agency Name:</b>  <b>Tribal Land Code:</b>  <b>Tribal Land Name:</b>  <b>Congressional Dist No:</b> 03  <b>Census Block Code:</b> 081119726001045  <b>EPA Region Code:</b> 08  <b>County Name:</b> SAN JUAN  <b>US/Mexico Border Ind:</b>  <b>Latitude:</b> 37.904037  <b>Longitude:</b> -107.61663  <b>Reference Point:</b>  <b>Coord Collection Method:</b>  <b>Accuracy Value:</b>  <b>Datum:</b> NAD83  <b>Source:</b>  <b>Facility Detail Rprt URL:</b> https://ofmpub.epa.gov/frs_public2/fii_query_detail.disp_program_facility?p_registry_id=110070058573  <b>Program Acronyms:</b> </div> <div>SEMS:CON000802497</div>						
<a href="#">26</a>	3 of 5	NNW	0.00 / 0.00	12,319.32 / 195	BONITA PEAK MINING DISTRICT Multiple sources near Animas River headwaters UNINCORPORATED CO 81433	SUPERFUND ROD
<div> <b>EPA ID:</b> CON000802497  <b>Site ID:</b> 0802497  <b>NPL Status:</b> Final  <b>Non NPL Status:</b>  <b>County:</b> SAN JUAN  <b>Region:</b> 08  <b>Data Source(s):</b> U.S. EPA SUPERFUND PROGRAM - Source: SEMS Superfund Public User Database - FOIA-002 Records of Decision (RODS), ROD Amendments, and Explanation of Significant Differences (ESDs); Searchable Superfund Decision Documents database (https://www.epa.gov/superfund/search-superfund-documents), made available by the US Environmental Protection Agency (EPA). Retrieved on February 08, 2022. </div>						

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<u>Document Information</u>						
Doc ID:	100006405					
Date:	05/20/2019					
Pub No:						
Description:						
PDF Link:	https://semspub.epa.gov/src/document/08/100006405					
Title:	Interim Record of Decision for the Bonita Peak Mining District Superfund Site					
Doc ID:	100010443					
Date:	04/30/2021					
Pub No:						
Description:						
PDF Link:	https://semspub.epa.gov/src/document/08/100010443					
Title:	INTERIM RECORD OF DECISION (IROD) FOR BONITA PEAK REPOSITORY, BONITA PEAK MINING DISTRICT SUPERFUND SITE, SAN JUAN COUNTY, COLORADO					
<u>Action Information</u>						
Seq ID:	2					
Action Name:	GOVT Decision Document (ROD)					
Operable Unit Name:	OU1 SITEWIDE - REMEDIAL					
Actual Comp Date:	04/30/21					
Seq ID:	1					
Action Name:	GOVT Decision Document (ROD)					
Operable Unit Name:	OU1 SITEWIDE - REMEDIAL					
Actual Comp Date:	05/20/19					
<a href="#">26</a>	4 of 5	NNW	0.00 / 0.00	12,319.32 / 195	BONITA PEAK MINING DISTRICT Multiple sources near Animas River headwaters UNINCORPORATED CO 81433	FED INST
EPA ID:	CON000802497					
Region Code:	08					
County:	SAN JUAN					
Latitude:	+37.904037					
Longitude:	-107.616630					
<u>Control Details</u>						
Actual Completion Date:	5/20/2019 4:00:00 AM					
Fiscal Year:	2019					
NPL Status:	Currently on the Final NPL					
Action Type:	Record of Decision					
Remedy Component:	Institutional Controls					
Media:	Sludge					
Federal Facility:	No					
Superfund Alt. Agreement:	No					
Operable Unit No:	01					
Sequence ID:	1					
Actual Completion Date:	5/20/2019 4:00:00 AM					
Fiscal Year:	2019					
NPL Status:	Currently on the Final NPL					
Action Type:	Record of Decision					
Remedy Component:	Institutional Controls					
Media:	Leachate					
Federal Facility:	No					
Superfund Alt. Agreement:	No					
Operable Unit No:	01					
Sequence ID:	1					

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Actual Completion Date:</b> 5/20/2019 4:00:00 AM <b>Fiscal Year:</b> 2019 <b>NPL Status:</b> Currently on the Final NPL <b>Action Type:</b> Record of Decision <b>Remedy Component:</b> Institutional Controls <b>Media:</b> Solid Waste <b>Federal Facility:</b> No <b>Superfund Alt. Agreement:</b> No <b>Operable Unit No:</b> 01 <b>Sequence ID:</b> 1						
<b>Actual Completion Date:</b> 5/20/2019 4:00:00 AM <b>Fiscal Year:</b> 2019 <b>NPL Status:</b> Currently on the Final NPL <b>Action Type:</b> Record of Decision <b>Remedy Component:</b> Institutional Controls <b>Media:</b> Soil <b>Federal Facility:</b> No <b>Superfund Alt. Agreement:</b> No <b>Operable Unit No:</b> 01 <b>Sequence ID:</b> 1						
<a href="#">26</a>	5 of 5	<b>NNW</b>	<b>0.00 / 0.00</b>	<b>12,319.32 / 195</b>	<b>BONITA PEAK MINING DISTRICT</b> <b>Multiple sources near Animas</b> <b>River headwaters</b> <b>UNINCORPORATED CO 81433</b>	<b>FED ENG</b>
<b>EPA ID:</b> CON000802497 <b>Region Code:</b> 08 <b>County:</b> SAN JUAN <b>Latitude:</b> +37.904037 <b>Longitude:</b> -107.616630						
<b><u>Control Details</u></b>						
<b>Actual Completion Date:</b> 5/20/2019 4:00:00 AM <b>Fiscal Year:</b> 2019 <b>NPL Status:</b> Currently on the Final NPL <b>Action Type:</b> Record of Decision <b>Remedy Component:</b> Monitoring (leachate) <b>Media:</b> Solid Waste <b>Federal Facility:</b> No <b>Superfund Alt. Agreement:</b> No <b>Operable Unit No:</b> 01 <b>Sequence ID:</b> 1						
<b>Actual Completion Date:</b> 5/20/2019 4:00:00 AM <b>Fiscal Year:</b> 2019 <b>NPL Status:</b> Currently on the Final NPL <b>Action Type:</b> Record of Decision <b>Remedy Component:</b> Dewatering <b>Media:</b> Sludge <b>Federal Facility:</b> No <b>Superfund Alt. Agreement:</b> No <b>Operable Unit No:</b> 01 <b>Sequence ID:</b> 1						
<b>Actual Completion Date:</b> 5/20/2019 4:00:00 AM <b>Fiscal Year:</b> 2019 <b>NPL Status:</b> Currently on the Final NPL <b>Action Type:</b> Record of Decision <b>Remedy Component:</b> Drainage/Erosion Control (dike/berm/levee) <b>Media:</b> Sludge <b>Federal Facility:</b> No <b>Superfund Alt. Agreement:</b> No <b>Operable Unit No:</b> 01 <b>Sequence ID:</b> 1						

<b>Map Key</b>	<b>Number of Records</b>	<b>Direction</b>	<b>Distance (mi/ft)</b>	<b>Elev/Diff (ft)</b>	<b>Site</b>	<b>DB</b>
<hr/>						
<b>Actual Completion Date:</b>		5/20/2019 4:00:00 AM				
<b>Fiscal Year:</b>		2019				
<b>NPL Status:</b>		Currently on the Final NPL				
<b>Action Type:</b>		Record of Decision				
<b>Remedy Component:</b>		Drainage/Erosion Control (dike/berm/levee)				
<b>Media:</b>		Leachate				
<b>Federal Facility:</b>		No				
<b>Superfund Alt. Agreement:</b>		No				
<b>Operable Unit No:</b>		01				
<b>Sequence ID:</b>		1				
<b>Actual Completion Date:</b>		5/20/2019 4:00:00 AM				
<b>Fiscal Year:</b>		2019				
<b>NPL Status:</b>		Currently on the Final NPL				
<b>Action Type:</b>		Record of Decision				
<b>Remedy Component:</b>		Cover (soil)				
<b>Media:</b>		Soil				
<b>Federal Facility:</b>		No				
<b>Superfund Alt. Agreement:</b>		No				
<b>Operable Unit No:</b>		01				
<b>Sequence ID:</b>		1				
<b>Actual Completion Date:</b>		5/20/2019 4:00:00 AM				
<b>Fiscal Year:</b>		2019				
<b>NPL Status:</b>		Currently on the Final NPL				
<b>Action Type:</b>		Record of Decision				
<b>Remedy Component:</b>		Drainage/Erosion Control (ditch)				
<b>Media:</b>		Leachate				
<b>Federal Facility:</b>		No				
<b>Superfund Alt. Agreement:</b>		No				
<b>Operable Unit No:</b>		01				
<b>Sequence ID:</b>		1				
<b>Actual Completion Date:</b>		5/20/2019 4:00:00 AM				
<b>Fiscal Year:</b>		2019				
<b>NPL Status:</b>		Currently on the Final NPL				
<b>Action Type:</b>		Record of Decision				
<b>Remedy Component:</b>		Drainage/Erosion Control (other, NOT OTHERWISE SPECIFIED)				
<b>Media:</b>		Solid Waste				
<b>Federal Facility:</b>		No				
<b>Superfund Alt. Agreement:</b>		No				
<b>Operable Unit No:</b>		01				
<b>Sequence ID:</b>		1				
<b>Actual Completion Date:</b>		5/20/2019 4:00:00 AM				
<b>Fiscal Year:</b>		2019				
<b>NPL Status:</b>		Currently on the Final NPL				
<b>Action Type:</b>		Record of Decision				
<b>Remedy Component:</b>		Excavation				
<b>Media:</b>		Sludge				
<b>Federal Facility:</b>		No				
<b>Superfund Alt. Agreement:</b>		No				
<b>Operable Unit No:</b>		01				
<b>Sequence ID:</b>		1				
<b>Actual Completion Date:</b>		5/20/2019 4:00:00 AM				
<b>Fiscal Year:</b>		2019				
<b>NPL Status:</b>		Currently on the Final NPL				
<b>Action Type:</b>		Record of Decision				
<b>Remedy Component:</b>		Excavation				
<b>Media:</b>		Solid Waste				
<b>Federal Facility:</b>		No				
<b>Superfund Alt. Agreement:</b>		No				
<b>Operable Unit No:</b>		01				
<b>Sequence ID:</b>		1				
<b>Actual Completion Date:</b>		5/20/2019 4:00:00 AM				
<b>Fiscal Year:</b>		2019				

<b>Map Key</b>	<b>Number of Records</b>	<b>Direction</b>	<b>Distance (mi/ft)</b>	<b>Elev/Diff (ft)</b>	<b>Site</b>	<b>DB</b>
<hr/>						
<b>NPL Status:</b>		Currently on the Final NPL				
<b>Action Type:</b>		Record of Decision				
<b>Remedy Component:</b>		Monitoring (surface water)				
<b>Media:</b>		Solid Waste				
<b>Federal Facility:</b>		No				
<b>Superfund Alt. Agreement:</b>		No				
<b>Operable Unit No:</b>		01				
<b>Sequence ID:</b>		1				
<b>Actual Completion Date:</b>		5/20/2019 4:00:00 AM				
<b>Fiscal Year:</b>		2019				
<b>NPL Status:</b>		Currently on the Final NPL				
<b>Action Type:</b>		Record of Decision				
<b>Remedy Component:</b>		Monitoring (leachate)				
<b>Media:</b>		Leachate				
<b>Federal Facility:</b>		No				
<b>Superfund Alt. Agreement:</b>		No				
<b>Operable Unit No:</b>		01				
<b>Sequence ID:</b>		1				
<b>Actual Completion Date:</b>		5/20/2019 4:00:00 AM				
<b>Fiscal Year:</b>		2019				
<b>NPL Status:</b>		Currently on the Final NPL				
<b>Action Type:</b>		Record of Decision				
<b>Remedy Component:</b>		Cap (engineered cap)				
<b>Media:</b>		Soil				
<b>Federal Facility:</b>		No				
<b>Superfund Alt. Agreement:</b>		No				
<b>Operable Unit No:</b>		01				
<b>Sequence ID:</b>		1				
<b>Actual Completion Date:</b>		5/20/2019 4:00:00 AM				
<b>Fiscal Year:</b>		2019				
<b>NPL Status:</b>		Currently on the Final NPL				
<b>Action Type:</b>		Record of Decision				
<b>Remedy Component:</b>		Cover (evapotranspiration)				
<b>Media:</b>		Soil				
<b>Federal Facility:</b>		No				
<b>Superfund Alt. Agreement:</b>		No				
<b>Operable Unit No:</b>		01				
<b>Sequence ID:</b>		1				
<b>Actual Completion Date:</b>		5/20/2019 4:00:00 AM				
<b>Fiscal Year:</b>		2019				
<b>NPL Status:</b>		Currently on the Final NPL				
<b>Action Type:</b>		Record of Decision				
<b>Remedy Component:</b>		Drainage/Erosion Control (other, NOT OTHERWISE SPECIFIED)				
<b>Media:</b>		Leachate				
<b>Federal Facility:</b>		No				
<b>Superfund Alt. Agreement:</b>		No				
<b>Operable Unit No:</b>		01				
<b>Sequence ID:</b>		1				
<b>Actual Completion Date:</b>		5/20/2019 4:00:00 AM				
<b>Fiscal Year:</b>		2019				
<b>NPL Status:</b>		Currently on the Final NPL				
<b>Action Type:</b>		Record of Decision				
<b>Remedy Component:</b>		Monitoring (liquid waste)				
<b>Media:</b>		Sludge				
<b>Federal Facility:</b>		No				
<b>Superfund Alt. Agreement:</b>		No				
<b>Operable Unit No:</b>		01				
<b>Sequence ID:</b>		1				
<b>Actual Completion Date:</b>		5/20/2019 4:00:00 AM				
<b>Fiscal Year:</b>		2019				
<b>NPL Status:</b>		Currently on the Final NPL				
<b>Action Type:</b>		Record of Decision				
<b>Remedy Component:</b>		Consolidate (onsite)				



Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<hr/>						
Media:		Sludge				
Federal Facility:		No				
Superfund Alt. Agreement:		No				
Operable Unit No:		01				
Sequence ID:		1				
Actual Completion Date:		5/20/2019 4:00:00 AM				
Fiscal Year:		2019				
NPL Status:		Currently on the Final NPL				
Action Type:		Record of Decision				
Remedy Component:		Consolidate (onsite)				
Media:		Solid Waste				
Federal Facility:		No				
Superfund Alt. Agreement:		No				
Operable Unit No:		01				
Sequence ID:		1				
Actual Completion Date:		5/20/2019 4:00:00 AM				
Fiscal Year:		2019				
NPL Status:		Currently on the Final NPL				
Action Type:		Record of Decision				
Remedy Component:		Dewatering				
Media:		Solid Waste				
Federal Facility:		No				
Superfund Alt. Agreement:		No				
Operable Unit No:		01				
Sequence ID:		1				
Actual Completion Date:		5/20/2019 4:00:00 AM				
Fiscal Year:		2019				
NPL Status:		Currently on the Final NPL				
Action Type:		Record of Decision				
Remedy Component:		Drainage/Erosion Control (dike/berm/levee)				
Media:		Solid Waste				
Federal Facility:		No				
Superfund Alt. Agreement:		No				
Operable Unit No:		01				
Sequence ID:		1				

<a href="#">27</a>	1 of 1	WNW	0.37 / 1,939.07	11,907.35 / -217	LEAD CARBONATE MINE SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID:	10264986			I1:	26	
Dev Status:	PAST PRODUCER			Latitude:	37.893921	
Code List:	PB ZN			Longitude:	-107.632324	
Url:	<a href="http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10264986">http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10264986</a>					

#### Commodity

I1:	27	Line:	1
Code:	PB	Inserted By:	MAS migration
Commodity:	Lead	Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic	Updated By:	USGS
Commodity Group:	Lead	Update Date:	29-OCT-2002 09:02:21
Importance:	Primary		
I1:	27	Line:	2
Code:	ZN	Inserted By:	MAS migration
Commodity:	Zinc	Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic	Updated By:	USGS
Commodity Group:	Zinc	Update Date:	29-OCT-2002 09:02:21
Importance:	Tertiary		

#### Names

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
I1:	23				Inserted By:	MAS migration
Status:	Current				Insert Date:	29-OCT-02
Site Name:	Lead Carbonate Mine				Updated By:	USGS
Line:	1				Update Date:	29-OCT-02

[28](#)

1 of 1

W

0.27 /  
1,418.07

11,623.81 /  
-500

BLACK HAWK  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

Dep ID: 10265018  
Dev Status: PAST PRODUCER  
Code List: AU CU  
Url: [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10265018](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10265018)

I1: 26  
Latitude: 37.882324  
Longitude: -107.63562

#### Commodity

I1: 36  
Code: AG  
Commodity: Silver  
Commodity Type: Metallic  
Commodity Group: Silver  
Importance: Tertiary  
Line: 4  
Inserted By: MAS migration  
Insert Date: 29-OCT-2002 09:00:24  
Updated By: USGS  
Update Date: 29-OCT-2002 09:02:21

I1: 36  
Code: ZN  
Commodity: Zinc  
Commodity Type: Metallic  
Commodity Group: Zinc  
Importance: Tertiary  
Line: 5  
Inserted By: MAS migration  
Insert Date: 29-OCT-2002 09:00:24  
Updated By: USGS  
Update Date: 29-OCT-2002 09:02:21

I1: 93  
Code: CU  
Commodity: Copper  
Commodity Type: Metallic  
Commodity Group: Copper  
Importance: Tertiary  
Line: 1  
Inserted By: MAS migration  
Insert Date: 29-OCT-2002 09:00:24  
Updated By: USGS  
Update Date: 29-OCT-2002 09:02:41

I1: 36  
Code: AU  
Commodity: Gold  
Commodity Type: Metallic  
Commodity Group: Gold  
Importance: Primary  
Line: 2  
Inserted By: MAS migration  
Insert Date: 29-OCT-2002 09:00:24  
Updated By: USGS  
Update Date: 29-OCT-2002 09:02:21

I1: 36  
Code: PB  
Commodity: Lead  
Commodity Type: Metallic  
Commodity Group: Lead  
Importance: Tertiary  
Line: 3  
Inserted By: MAS migration  
Insert Date: 29-OCT-2002 09:00:24  
Updated By: USGS  
Update Date: 29-OCT-2002 09:02:21

#### Names

I1: 24  
Status: Previous  
Site Name: Blackhawk  
Line: 2  
Inserted By: MAS migration  
Insert Date: 29-OCT-02  
Updated By: USGS  
Update Date: 29-OCT-02

#### Names

I1: 24  
Status: Current  
Site Name: Black Hawk  
Line: 1  
Inserted By: MAS migration  
Insert Date: 29-OCT-02  
Updated By: USGS  
Update Date: 29-OCT-02



Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	22 PB Lead Metallic Lead Tertiary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	2 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:21
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	22 AG Silver Metallic Silver Tertiary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	3 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:21
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	22 AU Gold Metallic Gold Tertiary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	1 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:21
<b><u>Names</u></b>						
<b>I1:</b> <b>Status:</b> <b>Site Name:</b> <b>Line:</b>	34 Current Benitoite 1				<b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	MAS migration 29-OCT-02 USGS 29-OCT-02

[31](#)

1 of 1

NNW

0.00 /  
0.00

12,431.29 /  
307

**BELLE CREOLE  
SAN JUAN COUNTY  
SILVERTON CO 81433**

**MRDS**

**Dep ID:** 10264607  
**Dev Status:** PAST PRODUCER  
**Code List:** AU PB  
**Url:** [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10264607](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10264607)

**I1:** 27  
**Latitude:** 37.904297  
**Longitude:** -107.61731

**Commodity**

<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	35 ZN Zinc Metallic Zinc Tertiary	<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	4 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:02:20
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	35 AG Silver Metallic Silver Tertiary	<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	3 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:02:20
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	35 AU Gold Metallic Gold Primary	<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	1 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:02:20
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b>	35 PB Lead Metallic Lead	<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	2 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:02:20

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
Importance:		Tertiary				
<u>Names</u>						
I1:	35			Inserted By:	MAS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Belle Creole			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	
<a href="#">32</a>	1 of 1	E	0.03 / 149.60	10,587.93 / -1,536	UNKNOWN SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID:		10167148		I1:	55	
Dev Status:		UNKNOWN		Latitude:	37.881104	
Code List:		ZN CU		Longitude:	-107.581726	
Url:		http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10167148				
<u>Commodity</u>						
I1:	33			Line:	5	
Code:	ZN			Inserted By:	MAS migration	
Commodity:	Zinc			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Zinc			Update Date:	29-OCT-2002 09:01:39	
Importance:	Primary					
I1:	33			Line:	2	
Code:	AU			Inserted By:	MAS migration	
Commodity:	Gold			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Gold			Update Date:	29-OCT-2002 09:01:39	
Importance:	Tertiary					
I1:	33			Line:	4	
Code:	AG			Inserted By:	MAS migration	
Commodity:	Silver			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Silver			Update Date:	29-OCT-2002 09:01:39	
Importance:	Tertiary					
I1:	33			Line:	1	
Code:	CU			Inserted By:	MAS migration	
Commodity:	Copper			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Copper			Update Date:	29-OCT-2002 09:01:39	
Importance:	Tertiary					
I1:	84			Line:	3	
Code:	PB			Inserted By:	MAS migration	
Commodity:	Lead			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Lead			Update Date:	29-OCT-2002 09:02:38	
Importance:	Tertiary					
<u>Names</u>						
I1:	14			Inserted By:	MAS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Unknown			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	





Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Commodity:</b>	Lead			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Lead			<b>Update Date:</b>	29-OCT-2002 09:01:57	
<b>Importance:</b>	Tertiary					
<b>I1:</b>	23			<b>Line:</b>	2	
<b>Code:</b>	AG			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Silver			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Silver			<b>Update Date:</b>	29-OCT-2002 09:01:57	
<b>Importance:</b>	Primary					
<b><u>Names</u></b>						
<b>I1:</b>	14			<b>Inserted By:</b>	MAS migration	
<b>Status:</b>	Current			<b>Insert Date:</b>	29-OCT-02	
<b>Site Name:</b>	Washington			<b>Updated By:</b>	USGS	
<b>Line:</b>	1			<b>Update Date:</b>	29-OCT-02	

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NNE

0.03 /  
170.38

12,637.42 /  
513

HIDDEN TREASURE  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

Dep ID: 10108457

Dev Status: PRODUCER

Code List: AU

Url: http://mrdata.usgs.gov/mrds/show-mrds.php?dep\_id=10108457

I1: 10

Latitude: 37.905701

Longitude: -107.603394

Commodity

I1: 25

Code: AU

Commodity: Gold

Commodity Type: Metallic

Commodity Group: Gold

Importance: Primary

Line: 1

Inserted By: MRDS migration

Insert Date: 29-OCT-2002 09:00:24

Updated By: USGS

Update Date: 29-OCT-2002 09:01:16

I1: 25

Code: AG

Commodity: Silver

Commodity Type: Metallic

Commodity Group: Silver

Importance: Primary

Line: 2

Inserted By: MRDS migration

Insert Date: 29-OCT-2002 09:00:24

Updated By: USGS

Update Date: 29-OCT-2002 09:01:16

Names

I1: 31

Status: Current

Site Name: Hidden Treasure

Line: 1

Inserted By: MRDS migration

Insert Date: 29-OCT-02

Updated By: USGS

Update Date: 29-OCT-02

<a href="#">35</a>	2 of 2	NNE	0.03 / 170.38	12,637.42 / 513	HIDDEN TREASURE SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID:	10240501			I1:	12	
Dev Status:	PAST PRODUCER			Latitude:	37.905701	
Code List:	AU AG			Longitude:	-107.603394	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10240501					
Commodity						

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<hr/>						
I1:	73			Line:	2	
Code:	AG			Inserted By:	MAS migration	
Commodity:	Silver			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Silver			Update Date:	29-OCT-2002 09:02:09	
Importance:	Tertiary					
I1:	73			Line:	1	
Code:	AU			Inserted By:	MAS migration	
Commodity:	Gold			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Gold			Update Date:	29-OCT-2002 09:02:09	
Importance:	Primary					
<u>Names</u>						
I1:	34			Inserted By:	MAS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Hidden Treasure			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	
<hr/>						
<a href="#">36</a>	1 of 1	NNE	0.31 / 1,643.07	12,624.95 / 501	SILVER QUEEN SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID:	10018674			I1:	12	
Dev Status:	OCCURRENCE			Latitude:	37.904297	
Code List:	PB			Longitude:	-107.596497	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10018674					
<u>Commodity</u>						
I1:	96			Line:	2	
Code:	ZN			Inserted By:	MRDS migration	
Commodity:	Zinc			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Zinc			Update Date:	29-OCT-2002 09:00:34	
Importance:	Primary					
I1:	96			Line:	3	
Code:	CU			Inserted By:	MRDS migration	
Commodity:	Copper			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Copper			Update Date:	29-OCT-2002 09:00:34	
Importance:	Primary					
I1:	96			Line:	1	
Code:	PB			Inserted By:	MRDS migration	
Commodity:	Lead			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Lead			Update Date:	29-OCT-2002 09:00:34	
Importance:	Primary					
<u>Names</u>						
I1:	18			Inserted By:	MRDS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Silver Queen			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	
<hr/>						
<a href="#">37</a>	1 of 1	WNW	0.38 / 1,988.59	11,890.89 / -233	BLACK HAWK MINE SAN JUAN COUNTY SILVERTON CO 81433	MRDS

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
Dep ID:	10119261			I1:	21	
Dev Status:	UNKNOWN			Latitude:	37.891479	
Code List:	U			Longitude:	-107.635925	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10119261					
<u>Commodity</u>						
I1:	11			Line:	1	
Code:	U			Inserted By:	MAS migration	
Commodity:	Uranium			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Uranium			Update Date:	29-OCT-2002 09:01:21	
Importance:	Tertiary					
<u>Materials</u>						
I1:	35			Inserted B:	MAS migration	
Material:	Copper			Insert Dat:	29-OCT-2002 09:44:3	
Ore or Gangue:	Unknown			Updated By:		
Rec:	1			Update Dat:		
I1:	35			Inserted B:	MAS migration	
Material:	Zincite			Insert Date:	29-OCT-2002 09:44:3	
Ore or Gangue:	Unknown			Updated By:		
Rec:	2			Update Date:		
<u>Names</u>						
I1:	24			Inserted By:	MAS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Black Hawk Mine			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	

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1 of 1

SE

0.64 /  
3,395.6511,947.39 /  
-177MONTEZUMA NO. 1 AND PLAIN  
STREAK  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

**Dep ID:** 10018648  
**Dev Status:** OCCURRENCE  
**Code List:** AU  
**Url:** http://mrdata.usgs.gov/mrds/show-mrds.php?dep\_id=10018648

**I1:** 35  
**Latitude:** 37.868713  
**Longitude:** -107.58728

**Commodity**

**I1:** 44  
**Code:** AG  
**Commodity:** Silver  
**Commodity Type:** Metallic  
**Commodity Group:** Silver  
**Importance:** Primary

**Line:** 2  
**Inserted By:** MRDS migration  
**Insert Date:** 29-OCT-02  
**Updated By:** USGS  
**Update Date:** 29-OCT-02

**I1:** 39  
**Code:** AU  
**Commodity:** Gold  
**Commodity Type:** Metallic  
**Commodity Group:** Gold  
**Importance:** Primary

**Line:** 1  
**Inserted By:** MRDS migration  
**Insert Date:** 29-OCT-02  
**Updated By:** USGS  
**Update Date:** 29-OCT-02

**Names**

**I1:** 42  
**Inserted By:** MRDS migration

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Status:</b>		Current		<b>Insert Date:</b>		29-OCT-02
<b>Site Name:</b>		Montezuma No. 1 and Plain Streak		<b>Updated By:</b>		USGS
<b>Line:</b>		1		<b>Update Date:</b>		29-OCT-02
<a href="#">39</a>	1 of 3	SW	0.08 / 429.88	12,790.50 / 666	MAGNOLIA SAN JUAN COUNTY SILVERTON CO 81433	MRDS
<b>Dep ID:</b>		10018507		<b>I1:</b>		15
<b>Dev Status:</b>		OCCURRENCE		<b>Latitude:</b>		37.863281
<b>Code List:</b>		W		<b>Longitude:</b>		-107.623718
<b>Url:</b>		http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10018507				
<b>Commodity</b>						
<b>I1:</b>		29		<b>Line:</b>		1
<b>Code:</b>		W		<b>Inserted By:</b>		MRDS migration
<b>Commodity:</b>		Tungsten		<b>Insert Date:</b>		29-OCT-2002 09:00:24
<b>Commodity Type:</b>		Metallic		<b>Updated By:</b>		USGS
<b>Commodity Group:</b>		Tungsten		<b>Update Date:</b>		29-OCT-2002 09:00:34
<b>Importance:</b>		Primary				
<b>Materials</b>						
<b>I1:</b>		83		<b>Inserted B:</b>		MRDS migration
<b>Material:</b>		Huebnerite		<b>Insert Dat:</b>		29-OCT-2002 09:44:3
<b>Ore or Gangue:</b>		Ore		<b>Updated By:</b>		
<b>Rec:</b>		1		<b>Update Dat:</b>		
<b>Names</b>						
<b>I1:</b>		92		<b>Inserted By:</b>		MRDS migration
<b>Status:</b>		Current		<b>Insert Date:</b>		29-OCT-02
<b>Site Name:</b>		Magnolia		<b>Updated By:</b>		USGS
<b>Line:</b>		1		<b>Update Date:</b>		29-OCT-02

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2 of 3

SW

0.08 / 429.88

12,790.50 / 666

NATALIE

SAN JUAN COUNTY

SILVERTON CO 81433

MRDS

Dep ID:

10016737

I1:

23

Dev Status:

PRODUCER

Latitude:

37.863281

Code List:

W

Longitude:

-107.623718

Url:

http://mrdata.usgs.gov/mrds/show-mrds.php?dep\_id=10016737

Commodity

I1:

10

Line:

1

Code:

W

Inserted By:

MRDS migration

Commodity:

Tungsten

Insert Date:

29-OCT-2002 09:00:24

Commodity Type:

Metallic

Updated By:

USGS

Commodity Group:

Tungsten

Update Date:

29-OCT-2002 09:00:33

Importance:

Primary

Materials

I1:

17

Inserted B:

MRDS migration

Material:

Huebnerite

Insert Dat:

29-OCT-2002 09:44:3

Ore or Gangue:

Ore

Updated By:

Rec:

1

Update Dat:



Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<u>Names</u>						
I1:	12			Inserted By:	MRDS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Natalie			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	
<a href="#">39</a>	3 of 3	SW	0.08 / 429.88	12,790.50 / 666	SILVER LEDGE SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID:	10108454			I1:	30	
Dev Status:	PRODUCER			Latitude:	37.863281	
Code List:	W			Longitude:	-107.623718	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10108454					
<u>Commodity</u>						
I1:	24			Line:	1	
Code:	W			Inserted By:	MRDS migration	
Commodity:	Tungsten			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Tungsten			Update Date:	29-OCT-2002 09:01:16	
Importance:	Primary					
<u>Materials</u>						
I1:	77			Inserted B:	MRDS migration	
Material:	Huebnerite			Insert Dat:	29-OCT-2002 09:44:3	
Ore or Gangue:	Ore			Updated By:		
Rec:	1			Update Dat:		
<u>Names</u>						
I1:	31			Inserted By:	MRDS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Silver Ledge			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	

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1 of 1

NW

0.10 / 541.58

12,354.89 / 231

ROSS BASIN  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

Dep ID:

10289028

I1:

22

Dev Status:

PAST PRODUCER

Latitude:

37.904724

Code List:

PB AG

Longitude:

-107.624512

Url:

http://mrdata.usgs.gov/mrds/show-mrds.php?dep\_id=10289028

Commodity

I1:

15

Line:

1

Code:

PB

Inserted By:

MAS migration

Commodity:

Lead

Insert Date:

29-OCT-2002 09:00:24

Commodity Type:

Metallic

Updated By:

USGS

Commodity Group:

Lead

Update Date:

29-OCT-2002 09:02:30

Importance:

Primary

I1:

15

Line:

3

Code:

ZN

Inserted By:

MAS migration

Commodity:

Zinc

Insert Date:

29-OCT-2002 09:00:24

Commodity Type:

Metallic

Updated By:

USGS

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<hr/>						
Commodity Group: Importance:	Zinc Tertiary			Update Date:	29-OCT-2002 09:02:30	
I1:	15			Line:	2	
Code:	AG			Inserted By:	MAS migration	
Commodity:	Silver			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Silver			Update Date:	29-OCT-2002 09:02:30	
Importance:	Tertiary					
 <u>Names</u>						
I1:	24			Inserted By:	MAS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Ross Basin			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	
 <u>Names</u>						
I1:	18			Inserted By:	MAS migration	
Status:	Previous			Insert Date:	29-OCT-02	
Site Name:	Queen Anne, Columbia, Seven Thirty			Updated By:	USGS	
Line:	2			Update Date:	29-OCT-02	
 <u>Names</u>						
I1:	24			Inserted By:	MAS migration	
Status:	Previous			Insert Date:	29-OCT-02	
Site Name:	Red Rogers, Bonanza, Canandaiqua			Updated By:	USGS	
Line:	4			Update Date:	29-OCT-02	
<hr/>						
<a href="#">41</a>	1 of 2	NNE	0.00 / 0.00	12,550.59 / 426	MASTODON SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID:	10018673			I1:	14	
Dev Status:	OCCURRENCE			Latitude:	37.908325	
Code List:	AG			Longitude:	-107.603394	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10018673					
 <u>Commodity</u>						
I1:	96			Line:	1	
Code:	AG			Inserted By:	MRDS migration	
Commodity:	Silver			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Silver			Update Date:	29-OCT-2002 09:00:34	
Importance:	Primary					
I1:	96			Line:	2	
Code:	PB			Inserted By:	MRDS migration	
Commodity:	Lead			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Lead			Update Date:	29-OCT-2002 09:00:34	
Importance:	Primary					
 <u>Names</u>						
I1:	18			Inserted By:	MRDS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Mastodon			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<a href="#">41</a>	2 of 2	NNE	0.00 / 0.00	12,550.59 / 426	MASTODON SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID:	10118758			I1:	11	
Dev Status:	PAST PRODUCER			Latitude:	37.908325	
Code List:	AG PB			Longitude:	-107.603394	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10118758					
<u>Commodity</u>						
I1:	12			Line:	1	
Code:	PB			Inserted By:	MAS migration	
Commodity:	Lead			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Lead			Update Date:	29-OCT-2002 09:01:21	
Importance:	Tertiary					
I1:	13			Line:	2	
Code:	AG			Inserted By:	MAS migration	
Commodity:	Silver			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Silver			Update Date:	29-OCT-2002 09:01:21	
Importance:	Primary					
<u>Names</u>						
I1:	35			Inserted By:	MAS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Mastodon			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	
<a href="#">42</a>	1 of 1	E	0.00 / 23.43	10,637.19 / -1,487	UNKNOWN GROUP SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID:	10240592			I1:	11	
Dev Status:	UNKNOWN			Latitude:	37.883301	
Code List:	ZN CU			Longitude:	-107.577209	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10240592					
<u>Commodity</u>						
I1:	29			Line:	4	
Code:	AG			Inserted By:	MAS migration	
Commodity:	Silver			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Silver			Update Date:	29-OCT-2002 09:02:09	
Importance:	Tertiary					
I1:	29			Line:	3	
Code:	PB			Inserted By:	MAS migration	
Commodity:	Lead			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Lead			Update Date:	29-OCT-2002 09:02:09	
Importance:	Tertiary					
I1:	29			Line:	5	
Code:	ZN			Inserted By:	MAS migration	
Commodity:	Zinc			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Zinc			Update Date:	29-OCT-2002 09:02:09	
Importance:	Primary					

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	28 CU Copper Metallic Copper Tertiary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	1 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:02:09
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	28 AU Gold Metallic Gold Tertiary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	2 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:02:09
<b><u>Names</u></b>						
<b>I1:</b> <b>Status:</b> <b>Site Name:</b> <b>Line:</b>	18 Current Unknown Group 1				<b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	MAS migration 29-OCT-02 USGS 29-OCT-02

<a href="#">43</a>	1 of 1	NNE	0.38 / 2,026.05	12,625.29 / 501	SILVER QUEEN SAN JUAN COUNTY SILVERTON CO 81433	MRDS
<b>Dep ID:</b> <b>Dev Status:</b> <b>Code List:</b> <b>Url:</b>	10018675 OCCURRENCE AG http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10018675			<b>I1:</b> <b>Latitude:</b> <b>Longitude:</b>	20 37.906677 -107.595093	

<b><u>Commodity</u></b>						
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	96 AG Silver Metallic Silver Primary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	1 MRDS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:00:34
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	96 PB Lead Metallic Lead Primary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	2 MRDS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:00:34

<b><u>Materials</u></b>						
<b>I1:</b> <b>Material:</b> <b>Ore or Gangue:</b> <b>Rec:</b>	77 Galena Ore 2				<b>Inserted B:</b> <b>Insert Dat:</b> <b>Updated By:</b> <b>Update Dat:</b>	MRDS migration 29-OCT-2002 09:44:3
<b>I1:</b> <b>Material:</b> <b>Ore or Gangue:</b> <b>Rec:</b>	77 Pyrite Ore 3				<b>Inserted B:</b> <b>Insert Dat:</b> <b>Updated By:</b> <b>Update Dat:</b>	MRDS migration 29-OCT-2002 09:44:3
<b>I1:</b> <b>Material:</b> <b>Ore or Gangue:</b> <b>Rec:</b>	77 Sphalerite Ore 4				<b>Inserted B:</b> <b>Insert Dat:</b> <b>Updated By:</b> <b>Update Dat:</b>	MRDS migration 29-OCT-2002 09:44:3

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>I1:</b> <b>Material:</b> <b>Ore or Gangue:</b> <b>Rec:</b>	11 Tetrahedrite Ore 5				<b>Inserted B:</b> <b>Insert Dat:</b> <b>Updated By:</b> <b>Update Dat:</b>	MRDS migration 29-OCT-2002 09:44:3
<b>I1:</b> <b>Material:</b> <b>Ore or Gangue:</b> <b>Rec:</b>	29 Chalcopyrite Ore 1				<b>Inserted B:</b> <b>Insert Dat:</b> <b>Updated By:</b> <b>Update Dat:</b>	MRDS migration 29-OCT-2002 09:44:3
<b><u>Names</u></b>						
<b>I1:</b> <b>Status:</b> <b>Site Name:</b> <b>Line:</b>	18 Current Silver Queen 1				<b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	MRDS migration 29-OCT-02 USGS 29-OCT-02
<a href="#">44</a>	1 of 3	NNE	0.06 / 342.08	12,355.51 / 231	<b>GOLD PRINCE, MASTEDON SAN JUAN COUNTY SILVERTON CO 81433</b>	MRDS
<b>Dep ID:</b> <b>Dev Status:</b> <b>Code List:</b> <b>Url:</b>	10009757 PRODUCER PB http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10009757			<b>I1:</b> <b>Latitude:</b> <b>Longitude:</b>	20 37.908325 -107.600586	
<b><u>Commodity</u></b>						
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	28 PB Lead Metallic Lead Primary			<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	1 MRDS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:00:30	
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	28 CU Copper Metallic Copper Primary			<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	3 MRDS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:00:30	
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	28 ZN Zinc Metallic Zinc Primary			<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	2 MRDS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:00:30	
<b><u>Materials</u></b>						
<b>I1:</b> <b>Material:</b> <b>Ore or Gangue:</b> <b>Rec:</b>	19 Chalcopyrite Ore 1				<b>Inserted B:</b> <b>Insert Dat:</b> <b>Updated By:</b> <b>Update Dat:</b>	MRDS migration 29-OCT-2002 09:44:3
<b>I1:</b> <b>Material:</b> <b>Ore or Gangue:</b> <b>Rec:</b>	23 Galena Ore 2				<b>Inserted B:</b> <b>Insert Dat:</b> <b>Updated By:</b> <b>Update Dat:</b>	MRDS migration 29-OCT-2002 09:44:3
<b>I1:</b> <b>Material:</b> <b>Ore or Gangue:</b>	19 Sphalerite Ore				<b>Inserted B:</b> <b>Insert Dat:</b> <b>Updated By:</b>	MRDS migration 29-OCT-2002 09:44:3



Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
Rec:	3			Update Dat:		
<u>Names</u>						
I1:	40			Inserted By:	MRDS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Gold Prince, Mastedon			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	
<a href="#">44</a>	2 of 3	NNE	0.06 / 342.08	12,355.51 / 231	SILVER QUEEN MINE SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID:	10107900			I1:	16	
Dev Status:	PRODUCER			Latitude:	37.908325	
Code List:	PB			Longitude:	-107.600586	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10107900					
<u>Commodity</u>						
I1:	30			Line:	3	
Code:	CU			Inserted By:	MRDS migration	
Commodity:	Copper			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Copper			Update Date:	29-OCT-2002 09:01:16	
Importance:	Primary					
I1:	30			Line:	1	
Code:	PB			Inserted By:	MRDS migration	
Commodity:	Lead			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Lead			Update Date:	29-OCT-2002 09:01:16	
Importance:	Primary					
I1:	20			Line:	2	
Code:	ZN			Inserted By:	MRDS migration	
Commodity:	Zinc			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Zinc			Update Date:	29-OCT-2002 09:02:46	
Importance:	Primary					
<u>Materials</u>						
I1:	14			Inserted B:	MRDS migration	
Material:	Rhodonite			Insert Dat:	29-OCT-2002 09:44:3	
Ore or Gangue:	Ore			Updated By:		
Rec:	2			Update Dat:		
I1:	16			Inserted B:	MRDS migration	
Material:	Tetrahedrite			Insert Dat:	29-OCT-2002 09:44:3	
Ore or Gangue:	Ore			Updated By:		
Rec:	4			Update Dat:		
I1:	14			Inserted B:	MRDS migration	
Material:	Galena			Insert Dat:	29-OCT-2002 09:44:3	
Ore or Gangue:	Ore			Updated By:		
Rec:	1			Update Dat:		
I1:	14			Inserted B:	MRDS migration	
Material:	Sphalerite			Insert Dat:	29-OCT-2002 09:44:3	
Ore or Gangue:	Ore			Updated By:		
Rec:	3			Update Dat:		

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<u>Names</u>						
I1:	12				Inserted By:	MRDS migration
Status:	Current				Insert Date:	29-OCT-02
Site Name:	Silver Queen Mine				Updated By:	USGS
Line:	1				Update Date:	29-OCT-02
<a href="#">44</a>	3 of 3	NNE	0.06 / 342.08	12,355.51 / 231	GOLD PRINCE SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID:	10281398			I1:	21	
Dev Status:	PRODUCER			Latitude:	37.908325	
Code List:	MN			Longitude:	-107.600586	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10281398					
<u>Commodity</u>						
I1:	15			Line:	1	
Code:	MN			Inserted By:	MAS migration	
Commodity:	Manganese			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Manganese			Update Date:	29-OCT-2002 09:02:27	
Importance:	Primary					
<u>Names</u>						
I1:	35			Inserted By:	MAS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Gold Prince			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	
<a href="#">45</a>	1 of 1	WNW	0.45 / 2,360.98	11,536.51 / -588	LEAD CARBONATE SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID:	10240085			I1:	22	
Dev Status:	UNKNOWN			Latitude:	37.892883	
Code List:	CU			Longitude:	-107.638916	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10240085					
<u>Commodity</u>						
I1:	71			Line:	2	
Code:	PB			Inserted By:	MAS migration	
Commodity:	Lead			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Lead			Update Date:	29-OCT-2002 09:02:09	
Importance:	Tertiary					
I1:	95			Line:	5	
Code:	ZN			Inserted By:	MAS migration	
Commodity:	Zinc			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Zinc			Update Date:	29-OCT-2002 09:02:09	
Importance:	Tertiary					
I1:	93			Line:	3	
Code:	AG			Inserted By:	MAS migration	
Commodity:	Silver			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Silver			Update Date:	29-OCT-2002 09:02:09	
Importance:	Tertiary					

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	95 U Uranium Metallic Uranium Tertiary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	4 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:02:09
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	71 CU Copper Metallic Copper Tertiary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	1 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:02:09
<b><u>Materials</u></b>						
<b>I1:</b> <b>Material:</b> <b>Ore or Gangue:</b> <b>Rec:</b>	40 Galena Unknown 2				<b>Inserted B:</b> <b>Insert Dat:</b> <b>Updated By:</b> <b>Update Dat:</b>	MAS migration 29-OCT-2002 09:44:3
<b>I1:</b> <b>Material:</b> <b>Ore or Gangue:</b> <b>Rec:</b>	41 Calcite Unknown 1				<b>Inserted B:</b> <b>Insert Dat:</b> <b>Updated By:</b> <b>Update Dat:</b>	MAS migration 29-OCT-2002 09:44:3
<b>I1:</b> <b>Material:</b> <b>Ore or Gangue:</b> <b>Rec:</b>	40 Sphalerite Unknown 4				<b>Inserted B:</b> <b>Insert Dat:</b> <b>Updated By:</b> <b>Update Dat:</b>	MAS migration 29-OCT-2002 09:44:3
<b>I1:</b> <b>Material:</b> <b>Ore or Gangue:</b> <b>Rec:</b>	40 Quartz Unknown 3				<b>Inserted B:</b> <b>Insert Dat:</b> <b>Updated By:</b> <b>Update Dat:</b>	MAS migration 29-OCT-2002 09:44:3
<b><u>Names</u></b>						
<b>I1:</b> <b>Status:</b> <b>Site Name:</b> <b>Line:</b>	35 Current Lead Carbonate 1				<b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	MAS migration 29-OCT-02 USGS 29-OCT-02

[46](#)

1 of 1

NNE

0.27 /  
1,408.19

12,435.30 /  
311

SILVER QUEEN LEAD ZINC GR  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

**Dep ID:** 10142879  
**Dev Status:** PAST PRODUCER  
**Code List:** PB ZN  
**Url:** [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10142879](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10142879)

**I1:** 14  
**Latitude:** 37.907471  
**Longitude:** -107.596985

**Commodity**

**I1:** 22  
**Code:** PB  
**Commodity:** Lead  
**Commodity Type:** Metallic  
**Commodity Group:** Lead  
**Importance:** Primary

**Line:** 1  
**Inserted By:** MAS migration  
**Insert Date:** 29-OCT-2002 09:00:24  
**Updated By:** USGS  
**Update Date:** 29-OCT-2002 09:01:30

**I1:** 22  
**Code:** ZN

**Line:** 2  
**Inserted By:** MAS migration

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Commodity:</b> Zinc <b>Commodity Type:</b> Metallic <b>Commodity Group:</b> Zinc <b>Importance:</b> Tertiary  <b>Insert Date:</b> 29-OCT-2002 09:00:24 <b>Updated By:</b> USGS <b>Update Date:</b> 29-OCT-2002 09:01:30						
<b><u>Names</u></b>						
<b>I1:</b> 10 <b>Status:</b> Current <b>Site Name:</b> Silver Queen Lead Zinc Gr <b>Line:</b> 1  <b>Inserted By:</b> MAS migration <b>Insert Date:</b> 29-OCT-02 <b>Updated By:</b> USGS <b>Update Date:</b> 29-OCT-02						
<a href="#">47</a>	1 of 2	WNW	0.05 / 273.91	12,245.81 / 122	PRIDE OF BONITA SAN JUAN COUNTY SILVERTON CO 81433	MRDS
<b>Dep ID:</b> 10107846 <b>Dev Status:</b> PRODUCER <b>Code List:</b> PB <b>Url:</b> http://mrddata.usgs.gov/mrds/show-mrds.php?dep_id=10107846  <b>I1:</b> 29 <b>Latitude:</b> 37.900085 <b>Longitude:</b> -107.633911						
<b><u>Commodity</u></b>						
<b>I1:</b> 31 <b>Code:</b> ZN <b>Commodity:</b> Zinc <b>Commodity Type:</b> Metallic <b>Commodity Group:</b> Zinc <b>Importance:</b> Primary  <b>Line:</b> 2 <b>Inserted By:</b> MRDS migration <b>Insert Date:</b> 29-OCT-2002 09:00:24 <b>Updated By:</b> USGS <b>Update Date:</b> 29-OCT-2002 09:01:16						
<b>I1:</b> 31 <b>Code:</b> PB <b>Commodity:</b> Lead <b>Commodity Type:</b> Metallic <b>Commodity Group:</b> Lead <b>Importance:</b> Primary  <b>Line:</b> 1 <b>Inserted By:</b> MRDS migration <b>Insert Date:</b> 29-OCT-2002 09:00:24 <b>Updated By:</b> USGS <b>Update Date:</b> 29-OCT-2002 09:01:16						
<b><u>Materials</u></b>						
<b>I1:</b> 23 <b>Material:</b> Sphalerite <b>Ore or Gangue:</b> Ore <b>Rec:</b> 3  <b>Inserted B:</b> MRDS migration <b>Insert Dat:</b> 29-OCT-2002 09:44:3 <b>Updated By:</b> <b>Update Dat:</b>						
<b>I1:</b> 18 <b>Material:</b> Galena <b>Ore or Gangue:</b> Ore <b>Rec:</b> 2  <b>Inserted B:</b> MRDS migration <b>Insert Dat:</b> 29-OCT-2002 09:44:3 <b>Updated By:</b> <b>Update Dat:</b>						
<b>I1:</b> 16 <b>Material:</b> Chalcopryrite <b>Ore or Gangue:</b> Ore <b>Rec:</b> 1  <b>Inserted B:</b> MRDS migration <b>Insert Dat:</b> 29-OCT-2002 09:44:3 <b>Updated By:</b> <b>Update Dat:</b>						
<b><u>Names</u></b>						
<b>I1:</b> 32 <b>Status:</b> Current <b>Site Name:</b> Pride of Bonita <b>Line:</b> 1  <b>Inserted By:</b> MRDS migration <b>Insert Date:</b> 29-OCT-02 <b>Updated By:</b> USGS <b>Update Date:</b> 29-OCT-02						

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
			273.91	122	SAN JUAN COUNTY SILVERTON CO 81433	
Dep ID:	10009762			I1:	23	
Dev Status:	OCCURRENCE			Latitude:	37.900085	
Code List:	PB			Longitude:	-107.633911	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10009762					
<u>Commodity</u>						
I1:	28			Line:	1	
Code:	PB			Inserted By:	MRDS migration	
Commodity:	Lead			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Lead			Update Date:	29-OCT-2002 09:00:30	
Importance:	Primary					
I1:	28			Line:	3	
Code:	CU			Inserted By:	MRDS migration	
Commodity:	Copper			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Copper			Update Date:	29-OCT-2002 09:00:30	
Importance:	Primary					
I1:	28			Line:	2	
Code:	ZN			Inserted By:	MRDS migration	
Commodity:	Zinc			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Zinc			Update Date:	29-OCT-2002 09:00:30	
Importance:	Primary					
<u>Materials</u>						
I1:	30			Inserted B:	MRDS migration	
Material:	Chalcopyrite			Insert Dat:	29-OCT-2002 09:44:3	
Ore or Gangue:	Ore			Updated By:		
Rec:	1			Update Dat:		
I1:	19			Inserted B:	MRDS migration	
Material:	Galena			Insert Dat:	29-OCT-2002 09:44:3	
Ore or Gangue:	Ore			Updated By:		
Rec:	2			Update Dat:		
I1:	19			Inserted B:	MRDS migration	
Material:	Sphalerite			Insert Dat:	29-OCT-2002 09:44:3	
Ore or Gangue:	Ore			Updated By:		
Rec:	3			Update Dat:		
<u>Names</u>						
I1:	18			Inserted By:	MRDS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Eagle Mountain			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	

<a href="#">48</a>	1 of 1	NNW	0.11 / 577.93	12,457.52 / 333	ROSE SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID:	10108299			I1:	28	
Dev Status:	PRODUCER			Latitude:	37.906677	
Code List:	W			Longitude:	-107.623718	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10108299					



Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b><u>Commodity</u></b>						
<b>I1:</b>	31			<b>Line:</b>	1	
<b>Code:</b>	W			<b>Inserted By:</b>	MRDS migration	
<b>Commodity:</b>	Tungsten			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Tungsten			<b>Update Date:</b>	29-OCT-2002 09:01:16	
<b>Importance:</b>	Primary					
<b><u>Materials</u></b>						
<b>I1:</b>	46			<b>Inserted B:</b>	MRDS migration	
<b>Material:</b>	Huebnerite			<b>Insert Dat:</b>	29-OCT-2002 09:44:3	
<b>Ore or Gangue:</b>	Ore			<b>Updated By:</b>		
<b>Rec:</b>	1			<b>Update Dat:</b>		
<b><u>Names</u></b>						
<b>I1:</b>	82			<b>Inserted By:</b>	MRDS migration	
<b>Status:</b>	Current			<b>Insert Date:</b>	29-OCT-02	
<b>Site Name:</b>	Rose			<b>Updated By:</b>	USGS	
<b>Line:</b>	1			<b>Update Date:</b>	29-OCT-02	

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1 of 1

WNW

0.34 /  
1,774.12

11,431.82 /  
-692

**GOLD KING  
SAN JUAN COUNTY  
SILVERTON CO 81433**

**MRDS**

**Dep ID:** 10167198  
**Dev Status:** PRODUCER  
**Code List:** AU AG CU  
**Url:** [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10167198](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10167198)

**I1:** 10  
**Latitude:** 37.89447  
**Longitude:** -107.638428

**Commodity**

<b>I1:</b>	17	<b>Line:</b>	5
<b>Code:</b>	ZN	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Zinc	<b>Insert Date:</b>	2002-10-29T09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Zinc	<b>Update Date:</b>	2002-10-29T09:01:39
<b>Importance:</b>	Tertiary		
<b>I1:</b>	17	<b>Line:</b>	3
<b>Code:</b>	PB	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Lead	<b>Insert Date:</b>	2002-10-29T09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Lead	<b>Update Date:</b>	2002-10-29T09:01:39
<b>Importance:</b>	Tertiary		
<b>I1:</b>	17	<b>Line:</b>	6
<b>Code:</b>	W	<b>Inserted By:</b>	AWILSON
<b>Commodity:</b>	Tungsten	<b>Insert Date:</b>	2015-08-27T16:00:06
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	
<b>Commodity Group:</b>	Tungsten	<b>Update Date:</b>	
<b>Importance:</b>	Tertiary		
<b>I1:</b>	17	<b>Line:</b>	1
<b>Code:</b>	CU	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Copper	<b>Insert Date:</b>	2002-10-29T09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Copper	<b>Update Date:</b>	2002-10-29T09:01:39
<b>Importance:</b>	Tertiary		
<b>I1:</b>	17	<b>Line:</b>	4
<b>Code:</b>	AG	<b>Inserted By:</b>	MAS migration

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Commodity:</b>	Silver			<b>Insert Date:</b>	2002-10-29T09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Silver			<b>Update Date:</b>	2002-10-29T09:01:39	
<b>Importance:</b>	Secondary					
<b>I1:</b>	17			<b>Line:</b>	2	
<b>Code:</b>	AU			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Gold			<b>Insert Date:</b>	2002-10-29T09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Gold			<b>Update Date:</b>	2002-10-29T09:01:39	
<b>Importance:</b>	Primary					
<b><u>Materials</u></b>						
<b>I1:</b>	20			<b>Inserted B:</b>	AWILSON	
<b>Material:</b>	Pyrite			<b>Insert Dat:</b>	2015-08-25T11:29:23	
<b>Ore or Gangue:</b>	Unknown			<b>Updated By:</b>	AWILSON	
<b>Rec:</b>	2			<b>Update Dat:</b>	2015-08-27T	
<b>I1:</b>	20			<b>Inserted B:</b>	AWILSON	
<b>Material:</b>	Galena			<b>Insert Dat:</b>	2015-08-25T11:29:10	
<b>Ore or Gangue:</b>	Unknown			<b>Updated By:</b>	AWILSON	
<b>Rec:</b>	1			<b>Update Dat:</b>	2015-08-27T	
<b>I1:</b>	20			<b>Inserted B:</b>	AWILSON	
<b>Material:</b>	Huebnerite			<b>Insert Dat:</b>	2015-08-27T16:10:28	
<b>Ore or Gangue:</b>	Unknown			<b>Updated By:</b>	AWILSON	
<b>Rec:</b>	3			<b>Update Dat:</b>	2015-08-27T	
<b><u>Names</u></b>						
<b>I1:</b>	43			<b>Inserted By:</b>	MAS migration	
<b>Status:</b>	Current			<b>Insert Date:</b>	2002-10-29	
<b>Site Name:</b>	Gold King			<b>Updated By:</b>	AWILSON	
<b>Line:</b>	1			<b>Update Date:</b>	2015-08-25	
<b><u>Names</u></b>						
<b>I1:</b>	43			<b>Inserted By:</b>	MAS migration	
<b>Status:</b>	Contains			<b>Insert Date:</b>	2002-10-29	
<b>Site Name:</b>	Gold King Extension			<b>Updated By:</b>	AWILSON	
<b>Line:</b>	2			<b>Update Date:</b>	2015-08-25	

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WNW

0.29 /  
1,555.6511,522.26 /  
-602GOLD KING  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

**Dep ID:** 10215736  
**Dev Status:** PAST PRODUCER  
**Code List:** PB AU  
**Url:** [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10215736](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10215736)

**I1:** 25  
**Latitude:** 37.895081  
**Longitude:** -107.638611

**Commodity**

**I1:** 14  
**Code:** AU  
**Commodity:** Gold  
**Commodity Type:** Metallic  
**Commodity Group:** Gold  
**Importance:** Tertiary

**Line:** 1  
**Inserted By:** MAS migration  
**Insert Date:** 29-OCT-2002 09:00:24  
**Updated By:** USGS  
**Update Date:** 29-OCT-2002 09:01:57

**I1:** 14  
**Code:** W  
**Line:** 3  
**Inserted By:** MAS migration

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<hr/>						
Commodity:	Tungsten			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Tungsten			Update Date:	29-OCT-2002 09:01:57	
Importance:	Tertiary					
I1:	14			Line:	4	
Code:	ZN			Inserted By:	MAS migration	
Commodity:	Zinc			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Zinc			Update Date:	29-OCT-2002 09:01:57	
Importance:	Primary					
I1:	14			Line:	2	
Code:	PB			Inserted By:	MAS migration	
Commodity:	Lead			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Lead			Update Date:	29-OCT-2002 09:01:57	
Importance:	Primary					
<hr/>						
<u>Names</u>						
I1:	35			Inserted By:	MAS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Gold King			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	
<hr/>						
<a href="#">51</a>	1 of 1	SE	0.65 / 3,456.93	11,453.01 / -671	SILVER WING PROPERTY SAN JUAN COUNTY SILVERTON CO 81433	MRDS
<hr/>						
Dep ID:	10018649			I1:	29	
Dev Status:	OCCURRENCE			Latitude:	37.866699	
Code List:	PB			Longitude:	-107.583984	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10018649					
<hr/>						
<u>Commodity</u>						
I1:	12			Line:	1	
Code:	PB			Inserted By:	MRDS migration	
Commodity:	Lead			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Lead			Update Date:	29-OCT-2002 09:00:34	
Importance:	Primary					
I1:	12			Line:	4	
Code:	AU			Inserted By:	MRDS migration	
Commodity:	Gold			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Gold			Update Date:	29-OCT-2002 09:00:34	
Importance:	Primary					
I1:	12			Line:	5	
Code:	AG			Inserted By:	MRDS migration	
Commodity:	Silver			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Silver			Update Date:	29-OCT-2002 09:00:34	
Importance:	Primary					
I1:	12			Line:	3	
Code:	CU			Inserted By:	MRDS migration	
Commodity:	Copper			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Copper			Update Date:	29-OCT-2002 09:00:34	
Importance:	Primary					
I1:	35			Line:	2	

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Code:</b>	ZN				<b>Inserted By:</b>	MRDS migration
<b>Commodity:</b>	Zinc				<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic				<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Zinc				<b>Update Date:</b>	29-OCT-2002 09:00:34
<b>Importance:</b>	Primary					
<b><u>Names</u></b>						
<b>I1:</b>	39				<b>Inserted By:</b>	MRDS migration
<b>Status:</b>	Current				<b>Insert Date:</b>	29-OCT-02
<b>Site Name:</b>	Silver Wing Property				<b>Updated By:</b>	USGS
<b>Line:</b>	1				<b>Update Date:</b>	29-OCT-02

<a href="#">52</a>	1 of 1	E	0.01 / 61.97	10,801.22 / -1,323	RANSOME LODE SAN JUAN COUNTY SILVERTON CO 81433	MRDS
<b>Dep ID:</b>	10009487			<b>I1:</b>	18	
<b>Dev Status:</b>	OCCURRENCE			<b>Latitude:</b>	37.883484	
<b>Code List:</b>	AG			<b>Longitude:</b>	-107.575623	
<b>Uri:</b>	<a href="http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10009487">http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10009487</a>					

#### **Commodity**

<b>I1:</b>	35			<b>Line:</b>	3	
<b>Code:</b>	ZN			<b>Inserted By:</b>	MRDS migration	
<b>Commodity:</b>	Zinc			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Zinc			<b>Update Date:</b>	29-OCT-2002 09:00:29	
<b>Importance:</b>	Primary					
<b>I1:</b>	35			<b>Line:</b>	1	
<b>Code:</b>	AG			<b>Inserted By:</b>	MRDS migration	
<b>Commodity:</b>	Silver			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Silver			<b>Update Date:</b>	29-OCT-2002 09:00:29	
<b>Importance:</b>	Primary					
<b>I1:</b>	35			<b>Line:</b>	2	
<b>Code:</b>	CU			<b>Inserted By:</b>	MRDS migration	
<b>Commodity:</b>	Copper			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Copper			<b>Update Date:</b>	29-OCT-2002 09:00:29	
<b>Importance:</b>	Primary					

#### **Materials**

<b>I1:</b>	13			<b>Inserted B:</b>	MRDS migration	
<b>Material:</b>	Galena			<b>Insert Dat:</b>	29-OCT-2002 09:44:3	
<b>Ore or Gangue:</b>	Ore			<b>Updated By:</b>		
<b>Rec:</b>	2			<b>Update Dat:</b>		
<b>I1:</b>	13			<b>Inserted B:</b>	MRDS migration	
<b>Material:</b>	Chalcopyrite			<b>Insert Dat:</b>	29-OCT-2002 09:44:3	
<b>Ore or Gangue:</b>	Ore			<b>Updated By:</b>		
<b>Rec:</b>	1			<b>Update Dat:</b>		
<b>I1:</b>	13			<b>Inserted B:</b>	MRDS migration	
<b>Material:</b>	Sphalerite			<b>Insert Dat:</b>	29-OCT-2002 09:44:3	
<b>Ore or Gangue:</b>	Ore			<b>Updated By:</b>		
<b>Rec:</b>	3			<b>Update Dat:</b>		

#### **Names**

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
I1:	13			Inserted By:	MRDS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Ransome Lode			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	
<a href="#">53</a>	1 of 1	NNE	0.09 / 500.19	12,507.23 / 383	INDEPENDENCE SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID:	10264760			I1:	20	
Dev Status:	PAST PRODUCER			Latitude:	37.910278	
Code List:	AU CU			Longitude:	-107.603699	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10264760					
<u>Commodity</u>						
I1:	36			Line:	2	
Code:	AU			Inserted By:	MAS migration	
Commodity:	Gold			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Gold			Update Date:	29-OCT-2002 09:02:21	
Importance:	Primary					
I1:	36			Line:	4	
Code:	AG			Inserted By:	MAS migration	
Commodity:	Silver			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Silver			Update Date:	29-OCT-2002 09:02:21	
Importance:	Tertiary					
I1:	36			Line:	5	
Code:	ZN			Inserted By:	MAS migration	
Commodity:	Zinc			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Zinc			Update Date:	29-OCT-2002 09:02:21	
Importance:	Tertiary					
I1:	36			Line:	1	
Code:	CU			Inserted By:	MAS migration	
Commodity:	Copper			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Copper			Update Date:	29-OCT-2002 09:02:21	
Importance:	Tertiary					
I1:	36			Line:	3	
Code:	PB			Inserted By:	MAS migration	
Commodity:	Lead			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Lead			Update Date:	29-OCT-2002 09:02:21	
Importance:	Tertiary					
<u>Names</u>						
I1:	34			Inserted By:	MAS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Independence			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	

<a href="#">54</a>	1 of 1	NW	0.09 / 478.27	12,336.04 / 212	ADELPHIN SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID:	10167141			I1:	17	
Dev Status:	PAST PRODUCER			Latitude:	37.904297	



Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
Code List:	AU			Longitude:	-107.631409	
Url:		http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10167141				
<u>Commodity</u>						
I1:	33			Line:	1	
Code:	AU			Inserted By:	MAS migration	
Commodity:	Gold			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Gold			Update Date:	29-OCT-2002 09:01:39	
Importance:	Primary					
<u>Names</u>						
I1:	24			Inserted By:	MAS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Adelphin			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	

551 of 2NNE0.38 /1,985.5012,417.25 /293SOUND DEMOCRAT  
SAN JUAN COUNTY  
SILVERTON CO 81433MRDS

Dep ID:10018556I1:25  
Dev Status:PRODUCERLatitude:37.908325  
Code List:AULongitude:-107.594177  
Url:http://mrdata.usgs.gov/mrds/show-mrds.php?dep\_id=10018556

Commodity

I1:10Line:3  
Code:PBInserted By:MRDS migration  
Commodity:LeadInsert Date:29-OCT-2002 09:00:24  
Commodity Type:MetallicUpdated By:USGS  
Commodity Group:LeadUpdate Date:29-OCT-2002 09:00:34  
Importance:Primary

I1:10Line:2  
Code:AGInserted By:MRDS migration  
Commodity:SilverInsert Date:29-OCT-2002 09:00:24  
Commodity Type:MetallicUpdated By:USGS  
Commodity Group:SilverUpdate Date:29-OCT-2002 09:00:34  
Importance:Primary

I1:10Line:1  
Code:AUInserted By:MRDS migration  
Commodity:GoldInsert Date:29-OCT-2002 09:00:24  
Commodity Type:MetallicUpdated By:USGS  
Commodity Group:GoldUpdate Date:29-OCT-2002 09:00:34  
Importance:Primary

Materials

I1:78Inserted B:MRDS migration  
Material:ChalcopyriteInsert Dat:29-OCT-2002 09:44:3  
Ore or Gangue:OreUpdated By:  
Rec:1Update Dat:

I1:71Inserted B:MRDS migration  
Material:QuartzInsert Dat:29-OCT-2002 09:44:3  
Ore or Gangue:OreUpdated By:  
Rec:4Update Dat:

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
I1: Material: Ore or Gangue: Rec:	78 Sphalerite Ore 6				Inserted B: Insert Dat: Updated By: Update Dat:	MRDS migration 29-OCT-2002 09:44:3
I1: Material: Ore or Gangue: Rec:	78 Pyrite Ore 3				Inserted B: Insert Dat: Updated By: Update Dat:	MRDS migration 29-OCT-2002 09:44:3
I1: Material: Ore or Gangue: Rec:	78 Galena Ore 2				Inserted B: Insert Dat: Updated By: Update Dat:	MRDS migration 29-OCT-2002 09:44:3
I1: Material: Ore or Gangue: Rec:	56 Rhodonite Ore 5				Inserted B: Insert Dat: Updated By: Update Dat:	MRDS migration 29-OCT-2002 09:44:3
<b><u>Names</u></b>						
I1: Status: Site Name: Line:	53 Current Sound Democrat 1				Inserted By: Insert Date: Updated By: Update Date:	MRDS migration 29-OCT-02 USGS 29-OCT-02

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2 of 2

NNE

0.38 /  
1,985.5012,417.25 /  
293SOUND DEMOCRAT  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

Dep ID: 10143010  
 Dev Status: PAST PRODUCER  
 Code List: AU PB  
 Uri: [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10143010](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10143010)

I1: 25  
 Latitude: 37.908325  
 Longitude: -107.594177

**Commodity**

I1:	24	Line:	2
Code:	PB	Inserted By:	MAS migration
Commodity:	Lead	Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic	Updated By:	USGS
Commodity Group:	Lead	Update Date:	29-OCT-2002 09:01:30
Importance:	Tertiary		

I1:	24	Line:	3
Code:	AG	Inserted By:	MAS migration
Commodity:	Silver	Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic	Updated By:	USGS
Commodity Group:	Silver	Update Date:	29-OCT-2002 09:01:30
Importance:	Tertiary		

I1:	24	Line:	1
Code:	AU	Inserted By:	MAS migration
Commodity:	Gold	Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic	Updated By:	USGS
Commodity Group:	Gold	Update Date:	29-OCT-2002 09:01:30
Importance:	Primary		

**Names**

I1:	24	Inserted By:	MAS migration
Status:	Current	Insert Date:	29-OCT-02
Site Name:	Sound Democrat	Updated By:	USGS



Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Importance:</b>		Tertiary				
<b>I1:</b>	25			<b>Line:</b>	5	
<b>Code:</b>	ZN			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Zinc			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Zinc			<b>Update Date:</b>	29-OCT-2002 09:01:48	
<b>Importance:</b>	Tertiary					
<b>I1:</b>	25			<b>Line:</b>	1	
<b>Code:</b>	CU			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Copper			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Copper			<b>Update Date:</b>	29-OCT-2002 09:01:48	
<b>Importance:</b>	Tertiary					
<b>I1:</b>	25			<b>Line:</b>	3	
<b>Code:</b>	PB			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Lead			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Lead			<b>Update Date:</b>	29-OCT-2002 09:01:48	
<b>Importance:</b>	Tertiary					
<b>I1:</b>	25			<b>Line:</b>	4	
<b>Code:</b>	AG			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Silver			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Silver			<b>Update Date:</b>	29-OCT-2002 09:01:48	
<b>Importance:</b>	Primary					
<b><u>Names</u></b>						
<b>I1:</b>	23			<b>Inserted By:</b>	MAS migration	
<b>Status:</b>	Current			<b>Insert Date:</b>	29-OCT-02	
<b>Site Name:</b>	Plain Streak			<b>Updated By:</b>	USGS	
<b>Line:</b>	1			<b>Update Date:</b>	29-OCT-02	

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1 of 2

WNW

0.52 /  
2,723.28

11,583.26 /  
-541

RED AND BONITA  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

**Dep ID:** 10018669  
**Dev Status:** OCCURRENCE  
**Code List:** W  
**Url:** [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10018669](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10018669)

**I1:** 47  
**Latitude:** 37.892273  
**Longitude:** -107.642029

**Commodity**

<b>I1:</b>	95	<b>Line:</b>	1
<b>Code:</b>	W	<b>Inserted By:</b>	MRDS migration
<b>Commodity:</b>	Tungsten	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Tungsten	<b>Update Date:</b>	29-OCT-2002 09:00:34
<b>Importance:</b>	Primary		

**Materials**

<b>I1:</b>	77	<b>Inserted B:</b>	MRDS migration
<b>Material:</b>	Huebnerite	<b>Insert Dat:</b>	29-OCT-2002 09:44:3
<b>Ore or Gangue:</b>	Ore	<b>Updated By:</b>	
<b>Rec:</b>	1	<b>Update Dat:</b>	

**Names**

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>I1:</b> <b>Status:</b> <b>Site Name:</b> <b>Line:</b>	51 Current Red and Bonita 1				<b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	MRDS migration 29-OCT-02 USGS 29-OCT-02
<a href="#">58</a>	2 of 2	WNW	0.52 / 2,723.28	11,583.26 / -541	<b>BISMARCK</b> <b>SAN JUAN COUNTY</b> <b>SILVERTON CO 81433</b>	MRDS
<b>Dep ID:</b> <b>Dev Status:</b> <b>Code List:</b> <b>Uri:</b>	10018668 PRODUCER W http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10018668			<b>I1:</b> <b>Latitude:</b> <b>Longitude:</b>	29 37.892273 -107.642029	
<b><u>Commodity</u></b>						
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	97 W Tungsten Metallic Tungsten Primary			<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	1 MRDS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:00:34	
<b><u>Materials</u></b>						
<b>I1:</b> <b>Material:</b> <b>Ore or Gangue:</b> <b>Rec:</b>	77 Huebnerite Ore 1			<b>Inserted B:</b> <b>Insert Dat:</b> <b>Updated By:</b> <b>Update Dat:</b>	MRDS migration 29-OCT-2002 09:44:3	
<b><u>Names</u></b>						
<b>I1:</b> <b>Status:</b> <b>Site Name:</b> <b>Line:</b>	39 Current Bismarck 1				<b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	MRDS migration 29-OCT-02 USGS 29-OCT-02
<a href="#">59</a>	1 of 1	WSW	0.81 / 4,259.81	11,193.73 / -930	<b>SILVER LEDGE</b> <b>SAN JUAN COUNTY</b> <b>SILVERTON CO 81433</b>	MRDS
<b>Dep ID:</b> <b>Dev Status:</b> <b>Code List:</b> <b>Uri:</b>	10119122 PAST PRODUCER W AU http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10119122			<b>I1:</b> <b>Latitude:</b> <b>Longitude:</b>	23 37.876892 -107.642822	
<b><u>Commodity</u></b>						
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	20 W Tungsten Metallic Tungsten Primary			<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	4 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:21	
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	20 ZN Zinc Metallic Zinc Tertiary			<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	5 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:21	



Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	22 PB Lead Metallic Lead Tertiary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	2 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:21
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	22 AU Gold Metallic Gold Tertiary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	1 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:21
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	22 AG Silver Metallic Silver Tertiary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	3 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:21
<b><u>Names</u></b>						
<b>I1:</b> <b>Status:</b> <b>Site Name:</b> <b>Line:</b>	24 Current Silver Ledge 1				<b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	MAS migration 29-OCT-02 USGS 29-OCT-02

60

1 of 1

E

0.00 /  
9.8810,486.00 /  
-1,638MONTEZUMA #1  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

**Dep ID:** 10143533  
**Dev Status:** PAST PRODUCER  
**Code List:** AG CU  
**Url:** [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10143533](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10143533)

**I1:** 31  
**Latitude:** 37.882324  
**Longitude:** -107.57312

**Commodity**

<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	32 AG Silver Metallic Silver Primary	<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	4 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:30
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	32 ZN Zinc Metallic Zinc Tertiary	<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	5 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:30
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	79 CU Copper Metallic Copper Tertiary	<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	1 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:02:37
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b>	32 AU Gold Metallic Gold	<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	2 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:30

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<hr/>						
Importance:	Tertiary					
I1:	32			Line:	3	
Code:	PB			Inserted By:	MAS migration	
Commodity:	Lead			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Lead			Update Date:	29-OCT-2002 09:01:30	
Importance:	Tertiary					
 <u>Names</u>						
I1:	35			Inserted By:	MAS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Montezuma #1			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	
<hr/>						
<a href="#">61</a>	1 of 1	NE	0.73 / 3,861.96	12,426.68 / 303	SILVER QUEEN LEAD ZINC GROUP SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID:	10108298			I1:	28	
Dev Status:	PRODUCER			Latitude:	37.906677	
Code List:	PB			Longitude:	-107.586975	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10108298					
 <u>Commodity</u>						
I1:	20			Line:	1	
Code:	PB			Inserted By:	MRDS migration	
Commodity:	Lead			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Lead			Update Date:	29-OCT-2002 09:02:46	
Importance:	Primary					
I1:	32			Line:	2	
Code:	ZN			Inserted By:	MRDS migration	
Commodity:	Zinc			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Zinc			Update Date:	29-OCT-2002 09:01:16	
Importance:	Primary					
 <u>Names</u>						
I1:	12			Inserted By:	MRDS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Silver Queen Lead Zinc Group			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	
<hr/>						
<a href="#">62</a>	1 of 1	ENE	0.65 / 3,446.70	12,352.16 / 228	UNKNOWN SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID:	10215720			I1:	17	
Dev Status:	UNKNOWN			Latitude:	37.900879	
Code List:	ZN CU			Longitude:	-107.57782	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10215720					
 <u>Commodity</u>						
I1:	27			Line:	1	
Code:	CU			Inserted By:	MAS migration	

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Commodity:</b>	Copper			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Copper			<b>Update Date:</b>	29-OCT-2002 09:01:57	
<b>Importance:</b>	Tertiary					
<b>I1:</b>	27			<b>Line:</b>	2	
<b>Code:</b>	AU			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Gold			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Gold			<b>Update Date:</b>	29-OCT-2002 09:01:57	
<b>Importance:</b>	Tertiary					
<b>I1:</b>	18			<b>Line:</b>	5	
<b>Code:</b>	ZN			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Zinc			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Zinc			<b>Update Date:</b>	29-OCT-2002 09:02:39	
<b>Importance:</b>	Primary					
<b>I1:</b>	18			<b>Line:</b>	3	
<b>Code:</b>	PB			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Lead			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Lead			<b>Update Date:</b>	29-OCT-2002 09:01:57	
<b>Importance:</b>	Tertiary					
<b>I1:</b>	27			<b>Line:</b>	4	
<b>Code:</b>	AG			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Silver			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Silver			<b>Update Date:</b>	29-OCT-2002 09:01:57	
<b>Importance:</b>	Tertiary					
<b><u>Names</u></b>						
<b>I1:</b>	14			<b>Inserted By:</b>	MAS migration	
<b>Status:</b>	Current			<b>Insert Date:</b>	29-OCT-02	
<b>Site Name:</b>	Unknown			<b>Updated By:</b>	USGS	
<b>Line:</b>	1			<b>Update Date:</b>	29-OCT-02	

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WNW

0.26 /  
1,371.5610,995.89 /  
-1,128RED & BONITA  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

**Dep ID:** 10264483  
**Dev Status:** PAST PRODUCER  
**Code List:** W  
**Url:** [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10264483](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10264483)

**I1:** 48  
**Latitude:** 37.897278  
**Longitude:** -107.643677

**Commodity**

<b>I1:</b>	34	<b>Line:</b>	1
<b>Code:</b>	W	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Tungsten	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Tungsten	<b>Update Date:</b>	29-OCT-2002 09:02:20
<b>Importance:</b>	Primary		

**Names**

<b>I1:</b>	24	<b>Inserted By:</b>	MAS migration
<b>Status:</b>	Current	<b>Insert Date:</b>	29-OCT-02
<b>Site Name:</b>	Red & Bonita	<b>Updated By:</b>	USGS
<b>Line:</b>	1	<b>Update Date:</b>	29-OCT-02

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<a href="#">64</a>	1 of 1	W	0.98 / 5,185.84	11,055.02 / -1,069	BIG COLORADO SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID:	10240500			I1:	96	
Dev Status:	PAST PRODUCER			Latitude:	37.876892	
Code List:	W			Longitude:	-107.646729	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10240500					
Commodity						
I1:	74			Line:	1	
Code:	W			Inserted By:	MAS migration	
Commodity:	Tungsten			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Tungsten			Update Date:	29-OCT-2002 09:02:09	
Importance:	Primary					
Names						
I1:	34			Inserted By:	MAS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Big Colorado			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	
<a href="#">65</a>	1 of 1	WNW	0.12 / 642.39	11,178.28 / -946	ADAMS SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID:	10108455			I1:	18	
Dev Status:	PRODUCER			Latitude:	37.900085	
Code List:	W			Longitude:	-107.642212	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10108455					
Commodity						
I1:	24			Line:	1	
Code:	W			Inserted By:	MRDS migration	
Commodity:	Tungsten			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Tungsten			Update Date:	29-OCT-2002 09:01:16	
Importance:	Primary					
Materials						
I1:	77			Inserted B:	MRDS migration	
Material:	Huebnerite			Insert Dat:	29-OCT-2002 09:44:3	
Ore or Gangue:	Ore			Updated By:		
Rec:	1			Update Dat:		
Names						
I1:	31			Inserted By:	MRDS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Adams			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	
<a href="#">66</a>	1 of 1	ENE	0.73 / 3,836.13	12,610.45 / 486	EARLY BIRD SAN JUAN COUNTY SILVERTON CO 81433	MRDS

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Dep ID:</b> <b>Dev Status:</b> <b>Code List:</b> <b>Url:</b>	10017829 OCCURRENCE AG <a href="http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10017829">http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10017829</a>			<b>I1:</b> <b>Latitude:</b> <b>Longitude:</b>	11 37.900085 -107.575623	
<b><u>Commodity</u></b>						
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	11 AG Silver Metallic Silver Primary			<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	1 MRDS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:00:34	
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	11 AU Gold Metallic Gold Primary			<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	2 MRDS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:00:34	
<b><u>Names</u></b>						
<b>I1:</b> <b>Status:</b> <b>Site Name:</b> <b>Line:</b>	52 Current Early Bird 1			<b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	MRDS migration 29-OCT-02 USGS 29-OCT-02	
<a href="#">67</a>	1 of 1	WNW	0.12 / 631.98	11,192.73 / -931	ADAMS LODGE - BISMARCK SAN JUAN COUNTY SILVERTON CO 81433	MRDS
<b>Dep ID:</b> <b>Dev Status:</b> <b>Code List:</b> <b>Url:</b>	10119011 PAST PRODUCER W <a href="http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10119011">http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10119011</a>			<b>I1:</b> <b>Latitude:</b> <b>Longitude:</b>	30 37.90033 -107.642212	
<b><u>Commodity</u></b>						
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	23 W Tungsten Metallic Tungsten Primary			<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	1 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:21	
<b><u>Names</u></b>						
<b>I1:</b> <b>Status:</b> <b>Site Name:</b> <b>Line:</b>	24 Current Adams Lodge - Bismark 1			<b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	MAS migration 29-OCT-02 USGS 29-OCT-02	
<a href="#">68</a>	1 of 1	WSW	0.96 / 5,043.47	11,334.84 / -789	UNKNOWN GROUP SAN JUAN COUNTY SILVERTON CO 81433	MRDS
<b>Dep ID:</b> <b>Dev Status:</b> <b>Code List:</b> <b>Url:</b>	10216117 UNKNOWN ZN CU <a href="http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10216117">http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10216117</a>			<b>I1:</b> <b>Latitude:</b> <b>Longitude:</b>	20 37.867493 -107.642517	



Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b><u>Commodity</u></b>						
I1:	23			Line:	2	
Code:	AU			Inserted By:	MAS migration	
Commodity:	Gold			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Gold			Update Date:	29-OCT-2002 09:01:57	
Importance:	Tertiary					
I1:	15			Line:	5	
Code:	ZN			Inserted By:	MAS migration	
Commodity:	Zinc			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Zinc			Update Date:	29-OCT-2002 09:02:39	
Importance:	Primary					
I1:	23			Line:	1	
Code:	CU			Inserted By:	MAS migration	
Commodity:	Copper			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Copper			Update Date:	29-OCT-2002 09:01:57	
Importance:	Tertiary					
I1:	23			Line:	4	
Code:	AG			Inserted By:	MAS migration	
Commodity:	Silver			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Silver			Update Date:	29-OCT-2002 09:01:57	
Importance:	Tertiary					
I1:	23			Line:	3	
Code:	PB			Inserted By:	MAS migration	
Commodity:	Lead			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Lead			Update Date:	29-OCT-2002 09:01:57	
Importance:	Tertiary					
<b><u>Names</u></b>						
I1:	24			Inserted By:	MAS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Unknown Group			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	

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1 of 1

NNW

0.01 /  
54.03

12,765.87 /  
642

MOUNTAIN QUEEN  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

Dep ID: 10119275  
 Dev Status: PAST PRODUCER  
 Code List: PB AU  
 Url: [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10119275](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10119275)

I1: 26  
 Latitude: 37.915283  
 Longitude: -107.61731

**Commodity**

I1:	12	Line:	2
Code:	PB	Inserted By:	MAS migration
Commodity:	Lead	Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic	Updated By:	USGS
Commodity Group:	Lead	Update Date:	29-OCT-2002 09:01:21
Importance:	Primary		
I1:	12	Line:	1

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Code:</b>	AU				<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Gold				<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic				<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Gold				<b>Update Date:</b>	29-OCT-2002 09:01:21
<b>Importance:</b>	Tertiary					
<b>I1:</b>	12				<b>Line:</b>	3
<b>Code:</b>	AG				<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Silver				<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic				<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Silver				<b>Update Date:</b>	29-OCT-2002 09:01:21
<b>Importance:</b>	Tertiary					
<b>I1:</b>	12				<b>Line:</b>	4
<b>Code:</b>	ZN				<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Zinc				<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic				<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Zinc				<b>Update Date:</b>	29-OCT-2002 09:01:21
<b>Importance:</b>	Tertiary					
<b><u>Names</u></b>						
<b>I1:</b>	35				<b>Inserted By:</b>	MAS migration
<b>Status:</b>	Current				<b>Insert Date:</b>	29-OCT-02
<b>Site Name:</b>	Mountain Queen				<b>Updated By:</b>	USGS
<b>Line:</b>	1				<b>Update Date:</b>	29-OCT-02

<a href="#">70</a>	1 of 2	W	0.78 / 4,107.74	10,611.16 / -1,513	STANDARD MILL SAN JUAN COUNTY SILVERTON CO 81433	MRDS
<b>Dep ID:</b>	10240259			<b>I1:</b>	22	
<b>Dev Status:</b>	PAST PRODUCER			<b>Latitude:</b>	37.890686	
<b>Code List:</b>	PB AU			<b>Longitude:</b>	-107.648682	
<b>Uri:</b>	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10240259					

<b><u>Commodity</u></b>						
<b>I1:</b>	26				<b>Line:</b>	1
<b>Code:</b>	AU				<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Gold				<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic				<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Gold				<b>Update Date:</b>	29-OCT-2002 09:02:09
<b>Importance:</b>	Tertiary					
<b>I1:</b>	26				<b>Line:</b>	2
<b>Code:</b>	PB				<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Lead				<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic				<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Lead				<b>Update Date:</b>	29-OCT-2002 09:02:09
<b>Importance:</b>	Primary					
<b>I1:</b>	26				<b>Line:</b>	3
<b>Code:</b>	AG				<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Silver				<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic				<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Silver				<b>Update Date:</b>	29-OCT-2002 09:02:09
<b>Importance:</b>	Tertiary					
<b>I1:</b>	26				<b>Line:</b>	4
<b>Code:</b>	ZN				<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Zinc				<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic				<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Zinc				<b>Update Date:</b>	29-OCT-2002 09:02:09
<b>Importance:</b>	Tertiary					

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
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**Names**

<b>I1:</b>	35	<b>Inserted By:</b>	MAS migration
<b>Status:</b>	Current	<b>Insert Date:</b>	29-OCT-02
<b>Site Name:</b>	Standard Mill	<b>Updated By:</b>	USGS
<b>Line:</b>	1	<b>Update Date:</b>	29-OCT-02

<a href="#">70</a>	2 of 2	W	0.78 / 4,107.74	10,611.16 / -1,513	AMERICAN TUNNEL SAN JUAN COUNTY SILVERTON CO 81433	MRDS
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<b>Dep ID:</b>	10265079	<b>I1:</b>	23
<b>Dev Status:</b>	PAST PRODUCER	<b>Latitude:</b>	37.890686
<b>Code List:</b>	PB AU	<b>Longitude:</b>	-107.648682
<b>Url:</b>	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10265079		

**Commodity**

<b>I1:</b>	14	<b>Line:</b>	2
<b>Code:</b>	PB	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Lead	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Lead	<b>Update Date:</b>	29-OCT-2002 09:02:41
<b>Importance:</b>	Primary		

<b>I1:</b>	73	<b>Line:</b>	1
<b>Code:</b>	AU	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Gold	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Gold	<b>Update Date:</b>	29-OCT-2002 09:02:21
<b>Importance:</b>	Tertiary		

<b>I1:</b>	73	<b>Line:</b>	3
<b>Code:</b>	AG	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Silver	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Silver	<b>Update Date:</b>	29-OCT-2002 09:02:21
<b>Importance:</b>	Tertiary		

<b>I1:</b>	73	<b>Line:</b>	4
<b>Code:</b>	ZN	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Zinc	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Zinc	<b>Update Date:</b>	29-OCT-2002 09:02:21
<b>Importance:</b>	Tertiary		

**Names**

<b>I1:</b>	24	<b>Inserted By:</b>	MAS migration
<b>Status:</b>	Previous	<b>Insert Date:</b>	29-OCT-02
<b>Site Name:</b>	Gold King Mine	<b>Updated By:</b>	USGS
<b>Line:</b>	3	<b>Update Date:</b>	29-OCT-02

**Names**

<b>I1:</b>	24	<b>Inserted By:</b>	MAS migration
<b>Status:</b>	Current	<b>Insert Date:</b>	29-OCT-02
<b>Site Name:</b>	American Tunnel	<b>Updated By:</b>	USGS
<b>Line:</b>	1	<b>Update Date:</b>	29-OCT-02

<a href="#">71</a>	1 of 1	WNW	0.22 / 1,157.63	11,399.50 / -725	PRIDE OF BONITA SAN JUAN COUNTY	MRDS
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Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
SILVERTON CO 81433						
Dep ID:	10143474			I1:	13	
Dev Status:	PAST PRODUCER			Latitude:	37.903931	
Code List:	PB CU			Longitude:	-107.641113	
Uri:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10143474					
<u>Commodity</u>						
I1:	55			Line:	1	
Code:	CU			Inserted By:	MAS migration	
Commodity:	Copper			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Copper			Update Date:	29-OCT-2002 09:01:30	
Importance:	Tertiary					
I1:	55			Line:	4	
Code:	ZN			Inserted By:	MAS migration	
Commodity:	Zinc			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Zinc			Update Date:	29-OCT-2002 09:01:30	
Importance:	Tertiary					
I1:	36			Line:	2	
Code:	PB			Inserted By:	MAS migration	
Commodity:	Lead			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Lead			Update Date:	29-OCT-2002 09:01:30	
Importance:	Primary					
I1:	20			Line:	3	
Code:	AG			Inserted By:	MAS migration	
Commodity:	Silver			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Silver			Update Date:	29-OCT-2002 09:02:37	
Importance:	Tertiary					
<u>Names</u>						
I1:	35			Inserted By:	MAS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Pride of Bonita			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	

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NE

0.85 /  
4,483.39

12,329.40 /  
205

UNKNOWN  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

Dep ID: 10118706  
Dev Status: UNKNOWN  
Code List: ZN  
Url: http://mrdata.usgs.gov/mrds/show-mrds.php?dep\_id=10118706

I1: 17  
Latitude: 37.909485  
Longitude: -107.583679

Commodity

I1:	11	Line:	1
Code:	ZN	Inserted By:	MAS migration
Commodity:	Zinc	Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic	Updated By:	USGS
Commodity Group:	Zinc	Update Date:	29-OCT-2002 09:01:21
Importance:	Primary		

Names

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
I1:	14			Inserted By:	MAS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Unknown			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	
<a href="#">73</a>	1 of 1	W	0.78 / 4,116.77	10,545.40 / -1,579	GOLD KING MILL PLACER SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID:	10018664			I1:	19	
Dev Status:	OCCURRENCE			Latitude:	37.89093	
Code List:	AU			Longitude:	-107.649109	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10018664					
<u>Commodity</u>						
I1:	16			Line:	1	
Code:	AU			Inserted By:	MRDS migration	
Commodity:	Gold			Insert Date:	2002-10-29T09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Gold			Update Date:	2002-10-29T09:00:34	
Importance:	Primary					
I1:	16			Line:	2	
Code:	AG			Inserted By:	AWILSON	
Commodity:	Silver			Insert Date:	2015-08-25T09:37:32	
Commodity Type:	Metallic			Updated By:		
Commodity Group:	Silver			Update Date:		
Importance:	Tertiary					
<u>Materials</u>						
I1:	22			Inserted B:	MRDS migration	
Material:	Gold			Insert Dat:	2002-10-29T09:44:37	
Ore or Gangue:	Ore			Updated By:		
Rec:	1			Update Dat:		
<u>Names</u>						
I1:	42			Inserted By:	MRDS migration	
Status:	Current			Insert Date:	2002-10-29	
Site Name:	Gold King Mill Placer			Updated By:	USGS	
Line:	1			Update Date:	2002-10-29	

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1 of 1

WNW

0.26 /  
1,377.10

10,926.57 /  
-1,198

PITTSBURGH  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

Dep ID:

10191550

I1:

29

Dev Status:

UNKNOWN

Latitude:

37.900085

Code List:

PB ZN

Longitude:

-107.644775

Uri:

http://mrdata.usgs.gov/mrds/show-mrds.php?dep\_id=10191550

Commodity

I1:

25

Line:

1

Code:

PB

Inserted By:

MAS migration

Commodity:

Lead

Insert Date:

29-OCT-2002 09:00:24

Commodity Type:

Metallic

Updated By:

USGS

Commodity Group:

Lead

Update Date:

29-OCT-2002 09:01:48

Importance:

Primary



Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
I1:	26			Line:	2	
Code:	ZN			Inserted By:	MAS migration	
Commodity:	Zinc			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Zinc			Update Date:	29-OCT-2002 09:01:48	
Importance:	Tertiary					
<u>Names</u>						
I1:	15			Inserted By:	MAS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Pittsburgh			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	
<a href="#">75</a>	1 of 2	WSW	0.90 / 4,762.88	11,988.77 / -135	BIG COLORADO SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID:	10018659			I1:	13	
Dev Status:	OCCURRENCE			Latitude:	37.863281	
Code List:	W			Longitude:	-107.642029	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10018659					
<u>Commodity</u>						
I1:	95			Line:	1	
Code:	W			Inserted By:	MRDS migration	
Commodity:	Tungsten			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Tungsten			Update Date:	29-OCT-2002 09:00:34	
Importance:	Primary					
<u>Materials</u>						
I1:	77			Inserted B:	MRDS migration	
Material:	Huebnerite			Insert Dat:	29-OCT-2002 09:44:3	
Ore or Gangue:	Ore			Updated By:		
Rec:	1			Update Dat:		
<u>Names</u>						
I1:	51			Inserted By:	MRDS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Big Colorado			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	
<a href="#">75</a>	2 of 2	WSW	0.90 / 4,762.88	11,988.77 / -135	GOLD THREAD SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID:	10018660			I1:	13	
Dev Status:	PRODUCER			Latitude:	37.863281	
Code List:	W			Longitude:	-107.642029	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10018660					
<u>Commodity</u>						
I1:	93			Line:	1	
Code:	W			Inserted By:	MRDS migration	
Commodity:	Tunasten			Insert Date:	29-OCT-2002 09:00:24	

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Commodity Type:</b>		Metallic			<b>Updated By:</b>	USGS
<b>Commodity Group:</b>		Tungsten			<b>Update Date:</b>	29-OCT-2002 09:00:34
<b>Importance:</b>		Primary				
<b><u>Materials</u></b>						
<b>I1:</b>	71				<b>Inserted B:</b>	MRDS migration
<b>Material:</b>	Huebnerite				<b>Insert Dat:</b>	29-OCT-2002 09:44:3
<b>Ore or Gangue:</b>	Ore				<b>Updated By:</b>	
<b>Rec:</b>	1				<b>Update Dat:</b>	
<b><u>Names</u></b>						
<b>I1:</b>	51				<b>Inserted By:</b>	MRDS migration
<b>Status:</b>	Current				<b>Insert Date:</b>	29-OCT-02
<b>Site Name:</b>	Gold Thread				<b>Updated By:</b>	USGS
<b>Line:</b>	1				<b>Update Date:</b>	29-OCT-02

<a href="#">76</a>	1 of 1	NNE	0.00 / 0.00	12,828.88 / 705	BLACK DIAMOND SAN JUAN COUNTY SILVERTON CO 81433	MRDS
<b>Dep ID:</b>		10017770		<b>I1:</b>	26	
<b>Dev Status:</b>		OCCURRENCE		<b>Latitude:</b>	37.916687	
<b>Code List:</b>		PB		<b>Longitude:</b>	-107.600586	
<b>Url:</b>		<a href="http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10017770">http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10017770</a>				

<b><u>Commodity</u></b>						
<b>I1:</b>	28			<b>Line:</b>	2	
<b>Code:</b>	AG			<b>Inserted By:</b>	MRDS migration	
<b>Commodity:</b>	Silver			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Silver			<b>Update Date:</b>	29-OCT-2002 09:00:34	
<b>Importance:</b>	Primary					
<b>I1:</b>	28			<b>Line:</b>	1	
<b>Code:</b>	PB			<b>Inserted By:</b>	MRDS migration	
<b>Commodity:</b>	Lead			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Lead			<b>Update Date:</b>	29-OCT-2002 09:00:34	
<b>Importance:</b>	Primary					
<b>I1:</b>	28			<b>Line:</b>	3	
<b>Code:</b>	CU			<b>Inserted By:</b>	MRDS migration	
<b>Commodity:</b>	Copper			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Copper			<b>Update Date:</b>	29-OCT-2002 09:00:34	
<b>Importance:</b>	Primary					

<b><u>Materials</u></b>						
<b>I1:</b>	46			<b>Inserted B:</b>	MRDS migration	
<b>Material:</b>	Tetrahedrite			<b>Insert Dat:</b>	29-OCT-2002 09:44:3	
<b>Ore or Gangue:</b>	Ore			<b>Updated By:</b>		
<b>Rec:</b>	1			<b>Update Dat:</b>		
<b><u>Names</u></b>						
<b>I1:</b>	28			<b>Inserted By:</b>	MRDS migration	
<b>Status:</b>	Current			<b>Insert Date:</b>	29-OCT-02	
<b>Site Name:</b>	Black Diamond			<b>Updated By:</b>	USGS	

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
Line:	1			Update Date:	29-OCT-02	
<a href="#">77</a>	1 of 1	E	0.01 / 69.34	9,857.26 / -2,267	EZRA R SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID:	10119212			I1:	76	
Dev Status:	OCCURRENCE			Latitude:	37.878296	
Code List:	AU			Longitude:	-107.566711	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10119212					
Commodity						
I1:	23			Line:	1	
Code:	AU			Inserted By:	MAS migration	
Commodity:	Gold			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Gold			Update Date:	29-OCT-2002 09:01:21	
Importance:	Tertiary					
I1:	19			Line:	2	
Code:	PB			Inserted By:	MAS migration	
Commodity:	Lead			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Lead			Update Date:	29-OCT-2002 09:01:21	
Importance:	Tertiary					
I1:	19			Line:	3	
Code:	AG			Inserted By:	MAS migration	
Commodity:	Silver			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Silver			Update Date:	29-OCT-2002 09:01:21	
Importance:	Tertiary					
Names						
I1:	35			Inserted By:	MAS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Ezra R			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	

<a href="#">78</a>	1 of 1	NW	0.12 / 621.06	11,927.99 / -196	GOLD KING SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID:	10017775			I1:	15	
Dev Status:	OCCURRENCE			Latitude:	37.912476	
Code List:	AU			Longitude:	-107.633911	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10017775					
<u>Commodity</u>						
I1:	17			Line:	3	
Code:	PB			Inserted By:	MRDS migration	
Commodity:	Lead			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Lead			Update Date:	29-OCT-2002 09:02:42	
Importance:	Primary					
I1:	27			Line:	1	
Code:	AU			Inserted By:	MRDS migration	
Commodity:	Gold			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Gold			Update Date:	29-OCT-2002 09:00:34	

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<hr/>						
<b>Importance:</b>	Primary					
<b>I1:</b>	27			<b>Line:</b>	2	
<b>Code:</b>	AG			<b>Inserted By:</b>	MRDS migration	
<b>Commodity:</b>	Silver			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Silver			<b>Update Date:</b>	29-OCT-2002 09:00:34	
<b>Importance:</b>	Primary					
 <b><u>Materials</u></b>						
<b>I1:</b>	14			<b>Inserted B:</b>	MRDS migration	
<b>Material:</b>	Galena			<b>Insert Dat:</b>	29-OCT-2002 09:44:3	
<b>Ore or Gangue:</b>	Ore			<b>Updated By:</b>		
<b>Rec:</b>	1			<b>Update Dat:</b>		
<b>I1:</b>	14			<b>Inserted B:</b>	MRDS migration	
<b>Material:</b>	Pyrite			<b>Insert Dat:</b>	29-OCT-2002 09:44:3	
<b>Ore or Gangue:</b>	Ore			<b>Updated By:</b>		
<b>Rec:</b>	2			<b>Update Dat:</b>		
 <b><u>Names</u></b>						
<b>I1:</b>	28			<b>Inserted By:</b>	MRDS migration	
<b>Status:</b>	Current			<b>Insert Date:</b>	29-OCT-02	
<b>Site Name:</b>	Gold King			<b>Updated By:</b>	USGS	
<b>Line:</b>	1			<b>Update Date:</b>	29-OCT-02	

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1 of 1

NW

0.26 /  
1,355.7011,494.43 /  
-630MOGUL  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

**Dep ID:** 10118864  
**Dev Status:** PAST PRODUCER  
**Code List:** AU CU  
**Url:** [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10118864](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10118864)

**I1:** 47  
**Latitude:** 37.910095  
**Longitude:** -107.638123

**Commodity**

**I1:** 12  
**Code:** ZN  
**Commodity:** Zinc  
**Commodity Type:** Metallic  
**Commodity Group:** Zinc  
**Importance:** Tertiary

**Line:** 5  
**Inserted By:** MAS migration  
**Insert Date:** 29-OCT-2002 09:00:24  
**Updated By:** USGS  
**Update Date:** 29-OCT-2002 09:01:21

**I1:** 12  
**Code:** CU  
**Commodity:** Copper  
**Commodity Type:** Metallic  
**Commodity Group:** Copper  
**Importance:** Tertiary

**Line:** 1  
**Inserted By:** MAS migration  
**Insert Date:** 29-OCT-2002 09:00:24  
**Updated By:** USGS  
**Update Date:** 29-OCT-2002 09:01:21

**I1:** 12  
**Code:** AU  
**Commodity:** Gold  
**Commodity Type:** Metallic  
**Commodity Group:** Gold  
**Importance:** Primary

**Line:** 2  
**Inserted By:** MAS migration  
**Insert Date:** 29-OCT-2002 09:00:24  
**Updated By:** USGS  
**Update Date:** 29-OCT-2002 09:01:21

**I1:** 12  
**Code:** PB  
**Commodity:** Lead  
**Commodity Type:** Metallic

**Line:** 3  
**Inserted By:** MAS migration  
**Insert Date:** 29-OCT-2002 09:00:24  
**Updated By:** USGS

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Commodity Group:</b> <b>Importance:</b>	Lead Tertiary				<b>Update Date:</b>	29-OCT-2002 09:01:21
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	36 AG Silver Metallic Silver Tertiary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	4 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:21
<b><u>Names</u></b>						
<b>I1:</b> <b>Status:</b> <b>Site Name:</b> <b>Line:</b>	35 Current Mogul 1				<b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	MAS migration 29-OCT-02 USGS 29-OCT-02

<a href="#">80</a>	1 of 2	NNE	0.25 / 1,298.83	11,797.63 / -326	<b>EVENING STAR</b> <b>SAN JUAN COUNTY</b> <b>SILVERTON CO 81433</b>	MRDS
<b>Dep ID:</b> <b>Dev Status:</b> <b>Code List:</b> <b>Url:</b>	10167415 PAST PRODUCER PB CU http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10167415				<b>I1:</b> <b>Latitude:</b> <b>Longitude:</b>	76 37.916687 -107.592285
<b><u>Commodity</u></b>						
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	33 CU Copper Metallic Copper Tertiary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	1 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:39
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	33 PB Lead Metallic Lead Primary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	3 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:39
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	33 AU Gold Metallic Gold Tertiary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	2 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:39
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	33 ZN Zinc Metallic Zinc Tertiary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	5 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:39
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	83 AG Silver Metallic Silver Tertiary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	4 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:02:38

**Names**



Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
I1: Status: Site Name: Line:	35 Current Evening Star 1				Inserted By: Insert Date: Updated By: Update Date:	MAS migration 29-OCT-02 USGS 29-OCT-02

<a href="#">80</a>	2 of 2	NNE	0.25 / 1,298.83	11,797.63 / -326	<b>EVENING STAR</b> <b>SAN JUAN COUNTY</b> <b>SILVERTON CO 81433</b>	MRDS
Dep ID: Dev Status: Code List: Uri:	10017769 PRODUCER PB http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10017769			I1: Latitude: Longitude:	13 37.916687 -107.592285	

#### Commodity

I1: Code: Commodity: Commodity Type: Commodity Group: Importance:	28 CU Copper Metallic Copper Primary	Line: Inserted By: Insert Date: Updated By: Update Date:	3 MRDS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:00:34
I1: Code: Commodity: Commodity Type: Commodity Group: Importance:	28 PB Lead Metallic Lead Primary	Line: Inserted By: Insert Date: Updated By: Update Date:	1 MRDS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:00:34
I1: Code: Commodity: Commodity Type: Commodity Group: Importance:	28 ZN Zinc Metallic Zinc Primary	Line: Inserted By: Insert Date: Updated By: Update Date:	2 MRDS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:00:34

#### Materials

I1: Material: Ore or Gangue: Rec:	66 Galena Ore 2	Inserted B: Insert Dat: Updated By: Update Dat:	MRDS migration 29-OCT-2002 09:44:3
I1: Material: Ore or Gangue: Rec:	66 Tetrahedrite Ore 5	Inserted B: Insert Dat: Updated By: Update Dat:	MRDS migration 29-OCT-2002 09:44:3
I1: Material: Ore or Gangue: Rec:	14 Chalcopyrite Ore 1	Inserted B: Insert Dat: Updated By: Update Dat:	MRDS migration 29-OCT-2002 09:44:3
I1: Material: Ore or Gangue: Rec:	14 Pyrite Ore 3	Inserted B: Insert Dat: Updated By: Update Dat:	MRDS migration 29-OCT-2002 09:44:3
I1: Material: Ore or Gangue: Rec:	14 Sphalerite Ore 4	Inserted B: Insert Dat: Updated By: Update Dat:	MRDS migration 29-OCT-2002 09:44:3

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b><u>Names</u></b>						
<b>I1:</b>	28				<b>Inserted By:</b>	MRDS migration
<b>Status:</b>	Current				<b>Insert Date:</b>	29-OCT-02
<b>Site Name:</b>	Evening Star				<b>Updated By:</b>	USGS
<b>Line:</b>	1				<b>Update Date:</b>	29-OCT-02

<a href="#">81</a>	1 of 1	NW	0.00 / 0.00	12,425.61 / 301	QUEEN ANNE SAN JUAN COUNTY SILVERTON CO 81433	MRDS
<b>Dep ID:</b>	10017771				<b>I1:</b>	94
<b>Dev Status:</b>	OCCURRENCE				<b>Latitude:</b>	37.915283
<b>Code List:</b>	PB				<b>Longitude:</b>	-107.630615
<b>Url:</b>	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10017771					

**Commodity**

<b>I1:</b>	27				<b>Line:</b>	1
<b>Code:</b>	PB				<b>Inserted By:</b>	MRDS migration
<b>Commodity:</b>	Lead				<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic				<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Lead				<b>Update Date:</b>	29-OCT-2002 09:00:34
<b>Importance:</b>	Primary					
<b>I1:</b>	27				<b>Line:</b>	2
<b>Code:</b>	AG				<b>Inserted By:</b>	MRDS migration
<b>Commodity:</b>	Silver				<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic				<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Silver				<b>Update Date:</b>	29-OCT-2002 09:00:34
<b>Importance:</b>	Primary					

**Names**

<b>I1:</b>	28				<b>Inserted By:</b>	MRDS migration
<b>Status:</b>	Current				<b>Insert Date:</b>	29-OCT-02
<b>Site Name:</b>	Queen Anne				<b>Updated By:</b>	USGS
<b>Line:</b>	1				<b>Update Date:</b>	29-OCT-02

<a href="#">82</a>	1 of 2	NW	0.00 / 5.14	12,500.68 / 377	COLUMBIA SAN JUAN COUNTY SILVERTON CO 81433	MRDS
<b>Dep ID:</b>	10017776				<b>I1:</b>	18
<b>Dev Status:</b>	PRODUCER				<b>Latitude:</b>	37.91571
<b>Code List:</b>	AG				<b>Longitude:</b>	-107.63092
<b>Url:</b>	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10017776					

**Commodity**

<b>I1:</b>	27				<b>Line:</b>	1
<b>Code:</b>	AG				<b>Inserted By:</b>	MRDS migration
<b>Commodity:</b>	Silver				<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic				<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Silver				<b>Update Date:</b>	29-OCT-2002 09:00:34
<b>Importance:</b>	Primary					
<b>I1:</b>	27				<b>Line:</b>	2
<b>Code:</b>	PB				<b>Inserted By:</b>	MRDS migration
<b>Commodity:</b>	Lead				<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic				<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Lead				<b>Update Date:</b>	29-OCT-2002 09:00:34
<b>Importance:</b>	Primary					

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b><u>Names</u></b>						
I1:	28				Inserted By:	MRDS migration
Status:	Current				Insert Date:	29-OCT-02
Site Name:	Columbia				Updated By:	USGS
Line:	1				Update Date:	29-OCT-02

<b>82</b>	<b>2 of 2</b>	<b>NW</b>	<b>0.00 / 5.14</b>	<b>12,500.68 / 377</b>	<b>COLUMBIA SAN JUAN COUNTY SILVERTON CO 81433</b>	<b>MRDS</b>
Dep ID:	10264880			I1:	27	
Dev Status:	PAST PRODUCER			Latitude:	37.91571	
Code List:	AG PB			Longitude:	-107.63092	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10264880					

**Commodity**

I1:	36	Line:	1
Code:	PB	Inserted By:	MAS migration
Commodity:	Lead	Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic	Updated By:	USGS
Commodity Group:	Lead	Update Date:	29-OCT-2002 09:02:21
Importance:	Tertiary		
I1:	36	Line:	2
Code:	AG	Inserted By:	MAS migration
Commodity:	Silver	Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic	Updated By:	USGS
Commodity Group:	Silver	Update Date:	29-OCT-2002 09:02:21
Importance:	Primary		

**Names**

I1:	35	Inserted By:	MAS migration
Status:	Current	Insert Date:	29-OCT-02
Site Name:	Columbia	Updated By:	USGS
Line:	1	Update Date:	29-OCT-02

<b>83</b>	<b>1 of 2</b>	<b>N</b>	<b>0.21 / 1,095.54</b>	<b>12,703.00 / 579</b>	<b>CUSTER SAN JUAN COUNTY SILVERTON CO 81433</b>	<b>MRDS</b>
Dep ID:	10289358			I1:	22	
Dev Status:	PAST PRODUCER			Latitude:	37.920105	
Code List:	AG PB			Longitude:	-107.60199	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10289358					

**Commodity**

I1:	36	Line:	1
Code:	PB	Inserted By:	MAS migration
Commodity:	Lead	Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic	Updated By:	USGS
Commodity Group:	Lead	Update Date:	29-OCT-2002 09:02:30
Importance:	Tertiary		
I1:	36	Line:	2
Code:	AG	Inserted By:	MAS migration
Commodity:	Silver	Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic	Updated By:	USGS

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Commodity Group:</b> <b>Importance:</b>		Silver Primary			<b>Update Date:</b> 29-OCT-2002 09:02:30	
<b><u>Names</u></b>						
<b>I1:</b> <b>Status:</b> <b>Site Name:</b> <b>Line:</b>	35 Current Custer 1			<b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	MAS migration 29-OCT-02 USGS 29-OCT-02	
<a href="#">83</a>	2 of 2	N	0.21 / 1,095.54	12,703.00 / 579	CUSTER SAN JUAN COUNTY SILVERTON CO 81433	MRDS
<b>Dep ID:</b> <b>Dev Status:</b> <b>Code List:</b> <b>Url:</b>	10017768 OCCURRENCE AG <a href="http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10017768">http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10017768</a>			<b>I1:</b> <b>Latitude:</b> <b>Longitude:</b>	18 37.920105 -107.60199	
<b><u>Commodity</u></b>						
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	28 PB Lead Metallic Lead Primary			<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	2 MRDS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:00:34	
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	28 AG Silver Metallic Silver Primary			<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	1 MRDS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:00:34	
<b><u>Materials</u></b>						
<b>I1:</b> <b>Material:</b> <b>Ore or Gangue:</b> <b>Rec:</b>	17 Pyrite Ore 1			<b>Inserted B:</b> <b>Insert Dat:</b> <b>Updated By:</b> <b>Update Dat:</b>	MRDS migration 29-OCT-2002 09:44:3	
<b><u>Names</u></b>						
<b>I1:</b> <b>Status:</b> <b>Site Name:</b> <b>Line:</b>	91 Current Custer 1			<b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	MRDS migration 29-OCT-02 USGS 29-OCT-02	
<a href="#">84</a>	1 of 1	NW	0.01 / 36.74	12,034.03 / -90	QUEEN ANNE SAN JUAN COUNTY SILVERTON CO 81433	MRDS
<b>Dep ID:</b> <b>Dev Status:</b> <b>Code List:</b> <b>Url:</b>	10142939 PAST PRODUCER AU <a href="http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10142939">http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10142939</a>			<b>I1:</b> <b>Latitude:</b> <b>Longitude:</b>	93 37.913879 -107.636108	
<b><u>Commodity</u></b>						
<b>I1:</b>	14			<b>Line:</b>	1	

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	AU Gold Metallic Gold Primary				<b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:30
<b><u>Names</u></b>						
<b>I1:</b> <b>Status:</b> <b>Site Name:</b> <b>Line:</b>	24 Current Queen Anne 1				<b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	MAS migration 29-OCT-02 USGS 29-OCT-02
<a href="#">85</a>	1 of 1	N	0.42 / 2,227.97	12,308.76 / 185	INDIAN CHIEF SAN JUAN COUNTY SILVERTON CO 81433	MRDS
<b>Dep ID:</b> <b>Dev Status:</b> <b>Code List:</b> <b>Uri:</b>	10119458 PAST PRODUCER AU PB http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10119458			<b>I1:</b> <b>Latitude:</b> <b>Longitude:</b>	88 37.920715 -107.613892	
<b><u>Commodity</u></b>						
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	12 AU Gold Metallic Gold Primary			<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	1 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:21	
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	12 AG Silver Metallic Silver Tertiary			<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	3 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:21	
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	12 ZN Zinc Metallic Zinc Tertiary			<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	4 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:21	
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	12 PB Lead Metallic Lead Tertiary			<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	2 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:21	
<b><u>Names</u></b>						
<b>I1:</b> <b>Status:</b> <b>Site Name:</b> <b>Line:</b>	34 Current Indian Chief 1				<b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	MAS migration 29-OCT-02 USGS 29-OCT-02

<a href="#">86</a>	1 of 1	E	0.24 / 1,279.26	10,036.97 / -2,087	UNKNOWN SAN JUAN COUNTY SILVERTON CO 81433	MRDS
<b>Dep ID:</b>	10119404			<b>I1:</b>	88	
161	erisinfo.com | Environmental Risk Information Services					Order No: 22100605183



Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Dev Status:</b>		UNKNOWN		<b>Latitude:</b>		37.881104
<b>Code List:</b>		ZN CU		<b>Longitude:</b>		-107.562317
<b>Uri:</b>		http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10119404				
<b><u>Commodity</u></b>						
<b>I1:</b>		22		<b>Line:</b>		1
<b>Code:</b>		CU		<b>Inserted By:</b>		MAS migration
<b>Commodity:</b>		Copper		<b>Insert Date:</b>		29-OCT-2002 09:00:24
<b>Commodity Type:</b>		Metallic		<b>Updated By:</b>		USGS
<b>Commodity Group:</b>		Copper		<b>Update Date:</b>		29-OCT-2002 09:01:21
<b>Importance:</b>		Tertiary				
<b>I1:</b>		22		<b>Line:</b>		2
<b>Code:</b>		AU		<b>Inserted By:</b>		MAS migration
<b>Commodity:</b>		Gold		<b>Insert Date:</b>		29-OCT-2002 09:00:24
<b>Commodity Type:</b>		Metallic		<b>Updated By:</b>		USGS
<b>Commodity Group:</b>		Gold		<b>Update Date:</b>		29-OCT-2002 09:01:21
<b>Importance:</b>		Tertiary				
<b>I1:</b>		22		<b>Line:</b>		4
<b>Code:</b>		AG		<b>Inserted By:</b>		MAS migration
<b>Commodity:</b>		Silver		<b>Insert Date:</b>		29-OCT-2002 09:00:24
<b>Commodity Type:</b>		Metallic		<b>Updated By:</b>		USGS
<b>Commodity Group:</b>		Silver		<b>Update Date:</b>		29-OCT-2002 09:01:21
<b>Importance:</b>		Tertiary				
<b>I1:</b>		22		<b>Line:</b>		3
<b>Code:</b>		PB		<b>Inserted By:</b>		MAS migration
<b>Commodity:</b>		Lead		<b>Insert Date:</b>		29-OCT-2002 09:00:24
<b>Commodity Type:</b>		Metallic		<b>Updated By:</b>		USGS
<b>Commodity Group:</b>		Lead		<b>Update Date:</b>		29-OCT-2002 09:01:21
<b>Importance:</b>		Tertiary				
<b>I1:</b>		22		<b>Line:</b>		5
<b>Code:</b>		ZN		<b>Inserted By:</b>		MAS migration
<b>Commodity:</b>		Zinc		<b>Insert Date:</b>		29-OCT-2002 09:00:24
<b>Commodity Type:</b>		Metallic		<b>Updated By:</b>		USGS
<b>Commodity Group:</b>		Zinc		<b>Update Date:</b>		29-OCT-2002 09:01:21
<b>Importance:</b>		Primary				
<b><u>Names</u></b>						
<b>I1:</b>		14		<b>Inserted By:</b>		MAS migration
<b>Status:</b>		Current		<b>Insert Date:</b>		29-OCT-02
<b>Site Name:</b>		Unknown		<b>Updated By:</b>		USGS
<b>Line:</b>		1		<b>Update Date:</b>		29-OCT-02

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E

0.20 /  
1,042.92

10,045.73 /  
-2,078

UNKNOWN  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

**Dep ID:** 10158833  
**Dev Status:** UNKNOWN  
**Code List:** ZN CU  
**Uri:** http://mrdata.usgs.gov/mrds/show-mrds.php?dep\_id=10158833

**I1:** 36  
**Latitude:** 37.887878  
**Longitude:** -107.562012

**Commodity**

<b>I1:</b>	12	<b>Line:</b>	2
<b>Code:</b>	AU	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Gold	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Gold	<b>Update Date:</b>	29-OCT-2002 09:01:36

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Importance:</b>		Tertiary				
<b>I1:</b>	12			<b>Line:</b>	5	
<b>Code:</b>	ZN			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Zinc			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Zinc			<b>Update Date:</b>	29-OCT-2002 09:01:36	
<b>Importance:</b>	Primary					
<b>I1:</b>	12			<b>Line:</b>	4	
<b>Code:</b>	AG			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Silver			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Silver			<b>Update Date:</b>	29-OCT-2002 09:01:36	
<b>Importance:</b>	Tertiary					
<b>I1:</b>	12			<b>Line:</b>	1	
<b>Code:</b>	CU			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Copper			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Copper			<b>Update Date:</b>	29-OCT-2002 09:01:36	
<b>Importance:</b>	Tertiary					
<b>I1:</b>	12			<b>Line:</b>	3	
<b>Code:</b>	PB			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Lead			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Lead			<b>Update Date:</b>	29-OCT-2002 09:01:36	
<b>Importance:</b>	Tertiary					
<b><u>Names</u></b>						
<b>I1:</b>	14			<b>Inserted By:</b>	MAS migration	
<b>Status:</b>	Current			<b>Insert Date:</b>	29-OCT-02	
<b>Site Name:</b>	Unknown			<b>Updated By:</b>	USGS	
<b>Line:</b>	1			<b>Update Date:</b>	29-OCT-02	

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NNW

0.27 /  
1,446.44

12,551.21 /  
427

COMO CONSOLIDATED  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

**Dep ID:** 10191907  
**Dev Status:** PAST PRODUCER  
**Code List:** PB CU  
**Uri:** [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10191907](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10191907)

**I1:** 43  
**Latitude:** 37.920898  
**Longitude:** -107.619507

**Commodity**

<b>I1:</b>	25	<b>Line:</b>	4
<b>Code:</b>	AG	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Silver	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Silver	<b>Update Date:</b>	29-OCT-2002 09:01:48
<b>Importance:</b>	Tertiary		
<b>I1:</b>	25	<b>Line:</b>	2
<b>Code:</b>	AU	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Gold	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Gold	<b>Update Date:</b>	29-OCT-2002 09:01:48
<b>Importance:</b>	Tertiary		
<b>I1:</b>	25	<b>Line:</b>	1
<b>Code:</b>	CU	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Copper	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Commodity Group:</b> <b>Importance:</b>	Copper Tertiary				<b>Update Date:</b> 29-OCT-2002 09:01:48	
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	25 ZN Zinc Metallic Zinc Tertiary				<b>Line:</b> 5 <b>Inserted By:</b> MAS migration <b>Insert Date:</b> 29-OCT-2002 09:00:24 <b>Updated By:</b> USGS <b>Update Date:</b> 29-OCT-2002 09:01:48	
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	25 PB Lead Metallic Lead Primary				<b>Line:</b> 3 <b>Inserted By:</b> MAS migration <b>Insert Date:</b> 29-OCT-2002 09:00:24 <b>Updated By:</b> USGS <b>Update Date:</b> 29-OCT-2002 09:01:48	
<b>Names</b>						
<b>I1:</b> <b>Status:</b> <b>Site Name:</b> <b>Line:</b>	34 Current Como Consolidated 1				<b>Inserted By:</b> MAS migration <b>Insert Date:</b> 29-OCT-02 <b>Updated By:</b> USGS <b>Update Date:</b> 29-OCT-02	

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E

0.29 /  
1,557.0010,587.38 /  
-1,537ENDLESS CHAIN  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

**Dep ID:** 10167378  
**Dev Status:** PAST PRODUCER  
**Code List:** LST\_D AU  
**Url:** [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10167378](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10167378)

**I1:** 54  
**Latitude:** 37.881104  
**Longitude:** -107.559998

#### Commodity

<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	33 LST_D Limestone, Dimension Non-metallic Stone, Dimension Primary	<b>Line:</b> 2 <b>Inserted By:</b> MAS migration <b>Insert Date:</b> 29-OCT-2002 09:00:24 <b>Updated By:</b> USGS <b>Update Date:</b> 29-OCT-2002 09:01:39
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	33 AU Gold Metallic Gold Tertiary	<b>Line:</b> 1 <b>Inserted By:</b> MAS migration <b>Insert Date:</b> 29-OCT-2002 09:00:24 <b>Updated By:</b> USGS <b>Update Date:</b> 29-OCT-2002 09:01:39

#### Names

<b>I1:</b> <b>Status:</b> <b>Site Name:</b> <b>Line:</b>	35 Current Endless Chain 1	<b>Inserted By:</b> MAS migration <b>Insert Date:</b> 29-OCT-02 <b>Updated By:</b> USGS <b>Update Date:</b> 29-OCT-02
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1 of 1

E

0.55 /  
2,897.1710,481.85 /  
-1,642AUBURN GROUP  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

**Dep ID:** 10167186  
**Dev Status:** PAST PRODUCER  
**Code List:** PB ZN  
**Url:** [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10167186](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10167186)

**I1:** 90  
**Latitude:** 37.893127  
**Longitude:** -107.560913

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b><u>Commodity</u></b>						
I1:	34			Line:	2	
Code:	ZN			Inserted By:	MAS migration	
Commodity:	Zinc			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Zinc			Update Date:	29-OCT-2002 09:01:39	
Importance:	Tertiary					
I1:	34			Line:	1	
Code:	PB			Inserted By:	MAS migration	
Commodity:	Lead			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Lead			Update Date:	29-OCT-2002 09:01:39	
Importance:	Primary					
<b><u>Names</u></b>						
I1:	24			Inserted By:	MAS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Auburn Group			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	

<a href="#">91</a>	1 of 2	NNW	0.35 / 1,860.42	12,434.01 / 310	ROLLO SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID:	10216484			I1:	21	
Dev Status:	PAST PRODUCER			Latitude:	37.922302	
Code List:	PB AU			Longitude:	-107.619995	
Url:	<a href="http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10216484">http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10216484</a>					

<b><u>Commodity</u></b>						
I1:	25			Line:	3	
Code:	AG			Inserted By:	MAS migration	
Commodity:	Silver			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Silver			Update Date:	29-OCT-2002 09:01:58	
Importance:	Tertiary					
I1:	25			Line:	4	
Code:	ZN			Inserted By:	MAS migration	
Commodity:	Zinc			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Zinc			Update Date:	29-OCT-2002 09:01:58	
Importance:	Tertiary					
I1:	25			Line:	2	
Code:	PB			Inserted By:	MAS migration	
Commodity:	Lead			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Lead			Update Date:	29-OCT-2002 09:01:58	
Importance:	Primary					
I1:	24			Line:	1	
Code:	AU			Inserted By:	MAS migration	
Commodity:	Gold			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Gold			Update Date:	29-OCT-2002 09:01:58	
Importance:	Tertiary					

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<u>Names</u>						
I1:	24				Inserted By:	MAS migration
Status:	Current				Insert Date:	29-OCT-02
Site Name:	Rollo				Updated By:	USGS
Line:	1				Update Date:	29-OCT-02
<a href="#">91</a>	2 of 2	NNW	0.35 / 1,860.42	12,434.01 / 310	ROLLO SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID:	10091010				I1:	17
Dev Status:	OCCURRENCE				Latitude:	37.922302
Code List:	PB				Longitude:	-107.619995
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10091010					
<u>Commodity</u>						
I1:	62				Line:	2
Code:	ZN				Inserted By:	MRDS migration
Commodity:	Zinc				Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic				Updated By:	USGS
Commodity Group:	Zinc				Update Date:	29-OCT-2002 09:01:08
Importance:	Primary					
I1:	62				Line:	1
Code:	PB				Inserted By:	MRDS migration
Commodity:	Lead				Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic				Updated By:	USGS
Commodity Group:	Lead				Update Date:	29-OCT-2002 09:01:08
Importance:	Primary					
<u>Names</u>						
I1:	39				Inserted By:	MRDS migration
Status:	Current				Insert Date:	29-OCT-02
Site Name:	Rollo				Updated By:	USGS
Line:	1				Update Date:	29-OCT-02
<a href="#">92</a>	1 of 1	SW	0.50 / 2,640.94	12,053.24 / -71	UNKNOWN SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID:	10191938				I1:	64
Dev Status:	OCCURRENCE				Latitude:	37.850098
Code List:	ZN CU				Longitude:	-107.636108
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10191938					
<u>Commodity</u>						
I1:	33				Line:	3
Code:	PB				Inserted By:	MAS migration
Commodity:	Lead				Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic				Updated By:	USGS
Commodity Group:	Lead				Update Date:	29-OCT-2002 09:01:48
Importance:	Tertiary					
I1:	33				Line:	5
Code:	ZN				Inserted By:	MAS migration
Commodity:	Zinc				Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic				Updated By:	USGS
Commodity Group:	Zinc				Update Date:	29-OCT-2002 09:01:48
Importance:	Primary					



Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	33 CU Copper Metallic Copper Tertiary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	1 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:48
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	33 AU Gold Metallic Gold Tertiary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	2 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:48
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	33 AG Silver Metallic Silver Tertiary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	4 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:48
<b><u>Names</u></b>						
<b>I1:</b> <b>Status:</b> <b>Site Name:</b> <b>Line:</b>	10 Current Unknown 1				<b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	MAS migration 29-OCT-02 USGS 29-OCT-02

<a href="#">93</a>	1 of 1	SSW	0.14 / 741.57	11,793.42 / -331	DAKOTA SAN JUAN COUNTY SILVERTON CO 81433	MRDS
<b>Dep ID:</b> <b>Dev Status:</b> <b>Code List:</b> <b>Url:</b>	10018599 OCCURRENCE F <a href="http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10018599">http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10018599</a>			<b>I1:</b> <b>Latitude:</b> <b>Longitude:</b>	42 37.84729 -107.629822	
<b><u>Commodity</u></b>						
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	88 F Fluorine-Fluorite Non-metallic Fluorine Primary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	1 MRDS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:00:34
<b><u>Names</u></b>						
<b>I1:</b> <b>Status:</b> <b>Site Name:</b> <b>Line:</b>	28 Current Dakota 1				<b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	MRDS migration 29-OCT-02 USGS 29-OCT-02
<a href="#">94</a>	1 of 1	N	0.58 / 3,071.55	12,631.38 / 507	SILVER CHORD SAN JUAN COUNTY SILVERTON CO 81433	MRDS
<b>Dep ID:</b> <b>Dev Status:</b> <b>Code List:</b> <b>Url:</b>	10240212 PAST PRODUCER PB ZN <a href="http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10240212">http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10240212</a>			<b>I1:</b> <b>Latitude:</b> <b>Longitude:</b>	21 37.923889 -107.614807	

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
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Commodity

<b>I1:</b>	23	<b>Line:</b>	2
<b>Code:</b>	ZN	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Zinc	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Zinc	<b>Update Date:</b>	29-OCT-2002 09:02:09
<b>Importance:</b>	Tertiary		

<b>I1:</b>	23	<b>Line:</b>	1
<b>Code:</b>	PB	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Lead	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Lead	<b>Update Date:</b>	29-OCT-2002 09:02:09
<b>Importance:</b>	Primary		

Names

<b>I1:</b>	24	<b>Inserted By:</b>	MAS migration
<b>Status:</b>	Current	<b>Insert Date:</b>	29-OCT-02
<b>Site Name:</b>	Silver Chord	<b>Updated By:</b>	USGS
<b>Line:</b>	1	<b>Update Date:</b>	29-OCT-02

<a href="#">95</a>	1 of 2	N	0.53 / 2,792.24	12,646.49 / 522	BELCHER SAN JUAN COUNTY SILVERTON CO 81433	MRDS
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<b>Dep ID:</b>	10018641	<b>I1:</b>	63
<b>Dev Status:</b>	OCCURRENCE	<b>Latitude:</b>	37.923889
<b>Code List:</b>	PB	<b>Longitude:</b>	-107.616699
<b>Url:</b>	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10018641		

Commodity

<b>I1:</b>	12	<b>Line:</b>	1
<b>Code:</b>	PB	<b>Inserted By:</b>	MRDS migration
<b>Commodity:</b>	Lead	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Lead	<b>Update Date:</b>	29-OCT-2002 09:00:34
<b>Importance:</b>	Primary		

<b>I1:</b>	12	<b>Line:</b>	2
<b>Code:</b>	ZN	<b>Inserted By:</b>	MRDS migration
<b>Commodity:</b>	Zinc	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Zinc	<b>Update Date:</b>	29-OCT-2002 09:00:34
<b>Importance:</b>	Primary		

Names

<b>I1:</b>	42	<b>Inserted By:</b>	MRDS migration
<b>Status:</b>	Current	<b>Insert Date:</b>	29-OCT-02
<b>Site Name:</b>	Belcher	<b>Updated By:</b>	USGS
<b>Line:</b>	1	<b>Update Date:</b>	29-OCT-02

<a href="#">95</a>	2 of 2	N	0.53 / 2,792.24	12,646.49 / 522	BELCHER TUN NO.1 SAN JUAN COUNTY SILVERTON CO 81433	MRDS
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<b>Dep ID:</b>	10191916	<b>I1:</b>	21
<b>Dev Status:</b>	PAST PRODUCER	<b>Latitude:</b>	37.923889
<b>Code List:</b>	PB AU	<b>Longitude:</b>	-107.616699
<b>Url:</b>	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10191916		

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b><u>Commodity</u></b>						
<b>I1:</b>	22			<b>Line:</b>	3	
<b>Code:</b>	AG			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Silver			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Silver			<b>Update Date:</b>	29-OCT-2002 09:01:48	
<b>Importance:</b>	Tertiary					
<b>I1:</b>	22			<b>Line:</b>	4	
<b>Code:</b>	ZN			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Zinc			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Zinc			<b>Update Date:</b>	29-OCT-2002 09:01:48	
<b>Importance:</b>	Tertiary					
<b>I1:</b>	24			<b>Line:</b>	1	
<b>Code:</b>	AU			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Gold			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Gold			<b>Update Date:</b>	29-OCT-2002 09:01:48	
<b>Importance:</b>	Tertiary					
<b>I1:</b>	22			<b>Line:</b>	2	
<b>Code:</b>	PB			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Lead			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Lead			<b>Update Date:</b>	29-OCT-2002 09:01:48	
<b>Importance:</b>	Primary					
<b><u>Names</u></b>						
<b>I1:</b>	35			<b>Inserted By:</b>	MAS migration	
<b>Status:</b>	Current			<b>Insert Date:</b>	29-OCT-02	
<b>Site Name:</b>	Belcher Tun No.1			<b>Updated By:</b>	USGS	
<b>Line:</b>	1			<b>Update Date:</b>	29-OCT-02	

[96](#)

1 of 2

NNW

0.43 /  
2,294.56

12,287.79 /  
164

BONANZA  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

**Dep ID:** 10240027  
**Dev Status:** PAST PRODUCER  
**Code List:** PB CU  
**Url:** [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10240027](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10240027)

**I1:** 50  
**Latitude:** 37.923706  
**Longitude:** -107.622803

**Commodity**

<b>I1:</b>	33	<b>Line:</b>	3
<b>Code:</b>	AG	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Silver	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Silver	<b>Update Date:</b>	29-OCT-2002 09:02:09
<b>Importance:</b>	Tertiary		
<b>I1:</b>	33	<b>Line:</b>	4
<b>Code:</b>	ZN	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Zinc	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Zinc	<b>Update Date:</b>	29-OCT-2002 09:02:09
<b>Importance:</b>	Tertiary		
<b>I1:</b>	33	<b>Line:</b>	2

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Code:</b>	PB				<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Lead				<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic				<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Lead				<b>Update Date:</b>	29-OCT-2002 09:02:09
<b>Importance:</b>	Primary					
<b>I1:</b>	33				<b>Line:</b>	1
<b>Code:</b>	CU				<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Copper				<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic				<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Copper				<b>Update Date:</b>	29-OCT-2002 09:02:09
<b>Importance:</b>	Tertiary					
<b><u>Names</u></b>						
<b>I1:</b>	35				<b>Inserted By:</b>	MAS migration
<b>Status:</b>	Current				<b>Insert Date:</b>	29-OCT-02
<b>Site Name:</b>	Bonanza				<b>Updated By:</b>	USGS
<b>Line:</b>	1				<b>Update Date:</b>	29-OCT-02

<a href="#">96</a>	2 of 2	NNW	0.43 / 2,294.56	12,287.79 / 164	<b>BONANZA SAN JUAN COUNTY SILVERTON CO 81433</b>	<b>MRDS</b>
<b>Dep ID:</b>	10016736				<b>I1:</b>	18
<b>Dev Status:</b>	PRODUCER				<b>Latitude:</b>	37.923706
<b>Code List:</b>	PB				<b>Longitude:</b>	-107.622803
<b>Uri:</b>	<a href="http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10016736">http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10016736</a>					

#### **Commodity**

<b>I1:</b>	99				<b>Line:</b>	4
<b>Code:</b>	CU				<b>Inserted By:</b>	MRDS migration
<b>Commodity:</b>	Copper				<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic				<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Copper				<b>Update Date:</b>	29-OCT-2002 09:00:33
<b>Importance:</b>	Primary					
<b>I1:</b>	99				<b>Line:</b>	1
<b>Code:</b>	PB				<b>Inserted By:</b>	MRDS migration
<b>Commodity:</b>	Lead				<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic				<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Lead				<b>Update Date:</b>	29-OCT-2002 09:00:33
<b>Importance:</b>	Primary					
<b>I1:</b>	99				<b>Line:</b>	2
<b>Code:</b>	ZN				<b>Inserted By:</b>	MRDS migration
<b>Commodity:</b>	Zinc				<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic				<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Zinc				<b>Update Date:</b>	29-OCT-2002 09:00:33
<b>Importance:</b>	Primary					
<b>I1:</b>	99				<b>Line:</b>	3
<b>Code:</b>	AG				<b>Inserted By:</b>	MRDS migration
<b>Commodity:</b>	Silver				<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic				<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Silver				<b>Update Date:</b>	29-OCT-2002 09:00:33
<b>Importance:</b>	Primary					

#### **Materials**

<b>I1:</b>	43				<b>Inserted B:</b>	MRDS migration
<b>Material:</b>	Pyrite				<b>Insert Dat:</b>	29-OCT-2002 09:44:3
<b>Ore or Gangue:</b>	Ore				<b>Updated By:</b>	

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
Rec:	3				Update Dat:	
I1:	16				Inserted B:	MRDS migration
Material:	Tetrahedrite				Insert Dat:	29-OCT-2002 09:44:3
Ore or Gangue:	Ore				Updated By:	
Rec:	4				Update Dat:	
I1:	16				Inserted B:	MRDS migration
Material:	Barite				Insert Dat:	29-OCT-2002 09:44:3
Ore or Gangue:	Ore				Updated By:	
Rec:	1				Update Dat:	
I1:	43				Inserted B:	MRDS migration
Material:	Galena				Insert Dat:	29-OCT-2002 09:44:3
Ore or Gangue:	Ore				Updated By:	
Rec:	2				Update Dat:	
<b>Names</b>						
I1:	12				Inserted By:	MRDS migration
Status:	Current				Insert Date:	29-OCT-02
Site Name:	Bonanza				Updated By:	USGS
Line:	1				Update Date:	29-OCT-02

<a href="#">97</a>	1 of 1	SE	0.97 / 5,112.03	9,903.28 / -2,221	UNKNOWN SAN JUAN COUNTY SILVERTON CO 81433	MRDS
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Dep ID:	10215850	I1:	96
Dev Status:	UNKNOWN	Latitude:	37.851929
Code List:	ZN CU	Longitude:	-107.573914
Url:	<a href="http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10215850">http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10215850</a>		

#### Commodity

I1:	27	Line:	5
Code:	ZN	Inserted By:	MAS migration
Commodity:	Zinc	Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic	Updated By:	USGS
Commodity Group:	Zinc	Update Date:	29-OCT-2002 09:01:57
Importance:	Primary		
I1:	27	Line:	4
Code:	AG	Inserted By:	MAS migration
Commodity:	Silver	Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic	Updated By:	USGS
Commodity Group:	Silver	Update Date:	29-OCT-2002 09:01:57
Importance:	Tertiary		
I1:	27	Line:	3
Code:	PB	Inserted By:	MAS migration
Commodity:	Lead	Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic	Updated By:	USGS
Commodity Group:	Lead	Update Date:	29-OCT-2002 09:01:57
Importance:	Tertiary		
I1:	27	Line:	1
Code:	CU	Inserted By:	MAS migration
Commodity:	Copper	Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic	Updated By:	USGS
Commodity Group:	Copper	Update Date:	29-OCT-2002 09:01:57
Importance:	Tertiary		
I1:	27	Line:	2
Code:	AU	Inserted By:	MAS migration
Commodity:	Gold	Insert Date:	29-OCT-2002 09:00:24



Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Commodity Type:</b> Metallic					<b>Updated By:</b> USGS	
<b>Commodity Group:</b> Gold					<b>Update Date:</b> 29-OCT-2002 09:01:57	
<b>Importance:</b> Tertiary						
<b><u>Names</u></b>						
<b>I1:</b>	24				<b>Inserted By:</b> MAS migration	
<b>Status:</b>	Current				<b>Insert Date:</b> 29-OCT-02	
<b>Site Name:</b>	Unknown				<b>Updated By:</b> USGS	
<b>Line:</b>	1				<b>Update Date:</b> 29-OCT-02	

981 of 1NNW0.45 /2,394.6112,258.94 /135SEVEN-THIRTY  
SAN JUAN COUNTY  
SILVERTON CO 81433MRDS

Dep ID:10017789I1:28  
Dev Status:OCCURRENCELatitude:37.9245  
Code List:PBLongitude:-107.624512  
Url:http://mrdata.usgs.gov/mrds/show-mrds.php?dep\_id=10017789

Commodity

I1:27Line:2  
Code:ZNInserted By:MRDS migration  
Commodity:ZincInsert Date:29-OCT-2002 09:00:24  
Commodity Type:MetallicUpdated By:USGS  
Commodity Group:ZincUpdate Date:29-OCT-2002 09:00:34  
Importance:Primary

I1:35Line:1  
Code:PBInserted By:MRDS migration  
Commodity:LeadInsert Date:29-OCT-2002 09:00:24  
Commodity Type:MetallicUpdated By:USGS  
Commodity Group:LeadUpdate Date:29-OCT-2002 09:00:34  
Importance:Primary

Names

I1:28Inserted By:MRDS migration  
Status:CurrentInsert Date:29-OCT-02  
Site Name:Seven-ThirtyUpdated By:USGS  
Line:1Update Date:29-OCT-02

99

1 of 2

NNW

0.30 /  
1,590.82

12,541.58 /  
417

RED ROGERS  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

Dep ID:

10143492

I1:

18

Dev Status:

PAST PRODUCER

Latitude:

37.923889

Code List:

PB

Longitude:

-107.627808

Url:

http://mrdata.usgs.gov/mrds/show-mrds.php?dep\_id=10143492

Commodity

I1:

14

Line:

1

Code:

PB

Inserted By:

MAS migration

Commodity:

Lead

Insert Date:

29-OCT-2002 09:00:24

Commodity Type:

Metallic

Updated By:

USGS

Commodity Group:

Lead

Update Date:

29-OCT-2002 09:01:30

Importance:

Primary

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<u>Names</u>						
I1:	18			Inserted By:	MAS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Red Rogers			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	
<a href="#">99</a>	2 of 2	NNW	0.30 / 1,590.82	12,541.58 / 417	RED ROGERS SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID:	10017774			I1:	94	
Dev Status:	OCCURRENCE			Latitude:	37.923889	
Code List:	PB			Longitude:	-107.627808	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10017774					
<u>Commodity</u>						
I1:	27			Line:	1	
Code:	PB			Inserted By:	MRDS migration	
Commodity:	Lead			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Lead			Update Date:	29-OCT-2002 09:00:34	
Importance:	Primary					
<u>Materials</u>						
I1:	17			Inserted B:	MRDS migration	
Material:	Bismuth			Insert Dat:	29-OCT-2002 09:44:3	
Ore or Gangue:	Ore			Updated By:		
Rec:	1			Update Dat:		
<u>Names</u>						
I1:	28			Inserted By:	MRDS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Red Rogers			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	
<a href="#">100</a>	1 of 1	SW	0.61 / 3,243.12	11,775.91 / -348	UNKNOWN SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID:	10264862			I1:	74	
Dev Status:	UNKNOWN			Latitude:	37.848083	
Code List:	ZN CU			Longitude:	-107.638428	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10264862					
<u>Commodity</u>						
I1:	55			Line:	3	
Code:	PB			Inserted By:	MAS migration	
Commodity:	Lead			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Lead			Update Date:	29-OCT-2002 09:02:21	
Importance:	Tertiary					
I1:	55			Line:	4	
Code:	AG			Inserted By:	MAS migration	
Commodity:	Silver			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Silver			Update Date:	29-OCT-2002 09:02:21	

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<hr/>						
<b>Importance:</b>	Tertiary					
<b>I1:</b>	55			<b>Line:</b>	2	
<b>Code:</b>	AU			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Gold			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Gold			<b>Update Date:</b>	29-OCT-2002 09:02:21	
<b>Importance:</b>	Tertiary					
<b>I1:</b>	55			<b>Line:</b>	5	
<b>Code:</b>	ZN			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Zinc			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Zinc			<b>Update Date:</b>	29-OCT-2002 09:02:21	
<b>Importance:</b>	Primary					
<b>I1:</b>	55			<b>Line:</b>	1	
<b>Code:</b>	CU			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Copper			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Copper			<b>Update Date:</b>	29-OCT-2002 09:02:21	
<b>Importance:</b>	Tertiary					
<b><u>Names</u></b>						
<b>I1:</b>	23			<b>Inserted By:</b>	MAS migration	
<b>Status:</b>	Current			<b>Insert Date:</b>	29-OCT-02	
<b>Site Name:</b>	Unknown			<b>Updated By:</b>	USGS	
<b>Line:</b>	1			<b>Update Date:</b>	29-OCT-02	

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1 of 1

N

0.80 /  
4,246.6912,741.63 /  
618SILVER CLOUD  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

**Dep ID:** 10018642  
**Dev Status:** OCCURRENCE  
**Code List:** PB  
**Uri:** [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10018642](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10018642)

**I1:** 28  
**Latitude:** 37.92749  
**Longitude:** -107.614502

**Commodity**

<b>I1:</b>	12	<b>Line:</b>	1
<b>Code:</b>	PB	<b>Inserted By:</b>	MRDS migration
<b>Commodity:</b>	Lead	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Lead	<b>Update Date:</b>	29-OCT-2002 09:00:34
<b>Importance:</b>	Primary		
<b>I1:</b>	12	<b>Line:</b>	3
<b>Code:</b>	CU	<b>Inserted By:</b>	MRDS migration
<b>Commodity:</b>	Copper	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Copper	<b>Update Date:</b>	29-OCT-2002 09:00:34
<b>Importance:</b>	Primary		
<b>I1:</b>	12	<b>Line:</b>	2
<b>Code:</b>	ZN	<b>Inserted By:</b>	MRDS migration
<b>Commodity:</b>	Zinc	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Zinc	<b>Update Date:</b>	29-OCT-2002 09:00:34
<b>Importance:</b>	Primary		

**Materials**

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
I1: Material: Ore or Gangue: Rec:	77 Chalcopyrite Ore 1				Inserted B: Insert Dat: Updated By: Update Dat:	MRDS migration 29-OCT-2002 09:44:3
I1: Material: Ore or Gangue: Rec:	69 Sphalerite Ore 3				Inserted B: Insert Dat: Updated By: Update Dat:	MRDS migration 29-OCT-2002 09:44:3
I1: Material: Ore or Gangue: Rec:	48 Galena Ore 2				Inserted B: Insert Dat: Updated By: Update Dat:	MRDS migration 29-OCT-2002 09:44:3
<b><u>Names</u></b>						
I1: Status: Site Name: Line:	42 Current Silver Cloud 1				Inserted By: Insert Date: Updated By: Update Date:	MRDS migration 29-OCT-02 USGS 29-OCT-02

<a href="#">102</a>	1 of 2	NNW	0.42 / 2,216.44	12,400.79 / 277	HESPERIAN SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID: Dev Status: Code List: Url:	10216263 PAST PRODUCER AU CU http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10216263			I1: Latitude: Longitude:	24 37.92572 -107.627502	

<b><u>Commodity</u></b>						
I1: Code: Commodity: Commodity Type: Commodity Group: Importance:	16 AG Silver Metallic Silver Tertiary			Line: Inserted By: Insert Date: Updated By: Update Date:	4 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:02:39	
I1: Code: Commodity: Commodity Type: Commodity Group: Importance:	24 CU Copper Metallic Copper Tertiary			Line: Inserted By: Insert Date: Updated By: Update Date:	1 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:57	
I1: Code: Commodity: Commodity Type: Commodity Group: Importance:	24 PB Lead Metallic Lead Tertiary			Line: Inserted By: Insert Date: Updated By: Update Date:	3 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:57	
I1: Code: Commodity: Commodity Type: Commodity Group: Importance:	24 AU Gold Metallic Gold Primary			Line: Inserted By: Insert Date: Updated By: Update Date:	2 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:57	

<b><u>Names</u></b>						
I1:	34			Inserted By:	MAS migration	

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
Status:	Current				Insert Date:	29-OCT-02
Site Name:	Hesperian				Updated By:	USGS
Line:	1				Update Date:	29-OCT-02

[102](#)      2 of 2      **NNW**      0.42 / 2,216.44      12,400.79 / 277      **SERRANO  
SAN JUAN COUNTY  
SILVERTON CO 81433**      **MRDS**

Dep ID: 10143330      I1: 81  
Dev Status: PAST PRODUCER      Latitude: 37.92572  
Code List: AU PB      Longitude: -107.627502  
Url: [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10143330](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10143330)

#### Commodity

I1: 23      Line: 2  
Code: PB      Inserted By: MAS migration  
Commodity: Lead      Insert Date: 29-OCT-2002 09:00:24  
Commodity Type: Metallic      Updated By: USGS  
Commodity Group: Lead      Update Date: 29-OCT-2002 09:01:30  
Importance: Tertiary

I1: 23      Line: 4  
Code: ZN      Inserted By: MAS migration  
Commodity: Zinc      Insert Date: 29-OCT-2002 09:00:24  
Commodity Type: Metallic      Updated By: USGS  
Commodity Group: Zinc      Update Date: 29-OCT-2002 09:01:30  
Importance: Tertiary

I1: 23      Line: 3  
Code: AG      Inserted By: MAS migration  
Commodity: Silver      Insert Date: 29-OCT-2002 09:00:24  
Commodity Type: Metallic      Updated By: USGS  
Commodity Group: Silver      Update Date: 29-OCT-2002 09:01:30  
Importance: Tertiary

I1: 23      Line: 1  
Code: AU      Inserted By: MAS migration  
Commodity: Gold      Insert Date: 29-OCT-2002 09:00:24  
Commodity Type: Metallic      Updated By: USGS  
Commodity Group: Gold      Update Date: 29-OCT-2002 09:01:30  
Importance: Primary

#### Names

I1: 24      Inserted By: MAS migration  
Status: Current      Insert Date: 29-OCT-02  
Site Name: Serrano      Updated By: USGS  
Line: 1      Update Date: 29-OCT-02

[103](#)      1 of 1      **NNW**      0.55 / 2,923.72      12,045.19 / -79      **PICKET  
SAN JUAN COUNTY  
SILVERTON CO 81433**      **MRDS**

Dep ID: 10118789      I1: 23  
Dev Status: PAST PRODUCER      Latitude: 37.926697  
Code List: AU PB      Longitude: -107.624817  
Url: [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10118789](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10118789)

#### Commodity

I1: 22      Line: 1  
Code: AU      Inserted By: MAS migration  
Commodity: Gold      Insert Date: 29-OCT-2002 09:00:24



Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Gold			<b>Update Date:</b>	29-OCT-2002 09:01:21	
<b>Importance:</b>	Primary					
<b>I1:</b>	79			<b>Line:</b>	3	
<b>Code:</b>	AG			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Silver			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Silver			<b>Update Date:</b>	29-OCT-2002 09:02:37	
<b>Importance:</b>	Tertiary					
<b>I1:</b>	22			<b>Line:</b>	2	
<b>Code:</b>	PB			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Lead			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Lead			<b>Update Date:</b>	29-OCT-2002 09:01:21	
<b>Importance:</b>	Tertiary					
<b>I1:</b>	22			<b>Line:</b>	4	
<b>Code:</b>	ZN			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Zinc			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Zinc			<b>Update Date:</b>	29-OCT-2002 09:01:21	
<b>Importance:</b>	Tertiary					
<b><u>Names</u></b>						
<b>I1:</b>	23			<b>Inserted By:</b>	MAS migration	
<b>Status:</b>	Current			<b>Insert Date:</b>	29-OCT-02	
<b>Site Name:</b>	Picket			<b>Updated By:</b>	USGS	
<b>Line:</b>	1			<b>Update Date:</b>	29-OCT-02	

[104](#)

1 of 1

SW

0.60 /  
3,166.0612,027.00 /  
-97UNKNOWN GROUP  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

**Dep ID:** 10216002  
**Dev Status:** UNKNOWN  
**Code List:** ZN CU  
**Uri:** [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10216002](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10216002)

**I1:** 24  
**Latitude:** 37.845703  
**Longitude:** -107.638428

**Commodity**

<b>I1:</b>	26	<b>Line:</b>	3
<b>Code:</b>	PB	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Lead	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Lead	<b>Update Date:</b>	29-OCT-2002 09:02:39
<b>Importance:</b>	Tertiary		
<b>I1:</b>	25	<b>Line:</b>	4
<b>Code:</b>	AG	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Silver	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Silver	<b>Update Date:</b>	29-OCT-2002 09:01:57
<b>Importance:</b>	Tertiary		
<b>I1:</b>	25	<b>Line:</b>	5
<b>Code:</b>	ZN	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Zinc	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Zinc	<b>Update Date:</b>	29-OCT-2002 09:01:57
<b>Importance:</b>	Primary		
<b>I1:</b>	24	<b>Line:</b>	2
<b>Code:</b>	AU	<b>Inserted By:</b>	MAS migration

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Commodity:</b>	Gold			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Gold			<b>Update Date:</b>	29-OCT-2002 09:01:57	
<b>Importance:</b>	Tertiary					
<b>I1:</b>	24			<b>Line:</b>	1	
<b>Code:</b>	CU			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Copper			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Copper			<b>Update Date:</b>	29-OCT-2002 09:01:57	
<b>Importance:</b>	Tertiary					
<b><u>Names</u></b>						
<b>I1:</b>	23			<b>Inserted By:</b>	MAS migration	
<b>Status:</b>	Current			<b>Insert Date:</b>	29-OCT-02	
<b>Site Name:</b>	Unknown Group			<b>Updated By:</b>	USGS	
<b>Line:</b>	1			<b>Update Date:</b>	29-OCT-02	

1051 of 1N0.86 /4,525.1211,861.55 /-263BURROWS  
SAN JUAN COUNTY  
SILVERTON CO 81433MRDS

Dep ID:10018643I1:26  
Dev Status:OCCURRENCELatitude:37.929321  
Code List:PBLongitude:-107.604797  
Url:http://mrdata.usgs.gov/mrds/show-mrds.php?dep\_id=10018643

Commodity

I1:12Line:2  
Code:ZNI1:12Line:2  
Commodity:ZincInserted By:MRDS migration  
Commodity Type:MetallicInsert Date:29-OCT-2002 09:00:24  
Commodity Group:ZincUpdated By:USGS  
Importance:PrimaryUpdate Date:29-OCT-2002 09:00:34

I1:12Line:1  
Code:PBInserted By:MRDS migration  
Commodity:LeadInsert Date:29-OCT-2002 09:00:24  
Commodity Type:MetallicUpdated By:USGS  
Commodity Group:LeadUpdate Date:29-OCT-2002 09:00:34  
Importance:Primary

Names

I1:39Inserted By:MRDS migration  
Status:CurrentInsert Date:29-OCT-02  
Site Name:BurrowsUpdated By:USGS  
Line:1Update Date:29-OCT-02

<a href="#">106</a>	1 of 1	NNW	0.57 / 3,006.81	12,085.04 / -39	EVENING STAR SAN JUAN COUNTY SILVERTON CO 81433	MRDS
<b>Dep ID:</b>	10167581			<b>I1:</b>	29	
<b>Dev Status:</b>	PAST PRODUCER			<b>Latitude:</b>	37.927917	
<b>Code List:</b>	PB AU			<b>Longitude:</b>	-107.627014	
<b>Url:</b>	<a href="http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10167581">http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10167581</a>					

**Commodity**

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	32 PB Lead Metallic Lead Primary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	2 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:39
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	16 AG Silver Metallic Silver Tertiary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	3 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:02:38
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	32 AU Gold Metallic Gold Tertiary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	1 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:39
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	33 ZN Zinc Metallic Zinc Tertiary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	4 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:39
<b><u>Names</u></b>						
<b>I1:</b> <b>Status:</b> <b>Site Name:</b> <b>Line:</b>	35 Current Evening Star 1				<b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	MAS migration 29-OCT-02 USGS 29-OCT-02

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NNE

0.92 /  
4,834.87

11,974.19 /  
-150

LITTLE IDA  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

**Dep ID:** 10119036  
**Dev Status:** PAST PRODUCER  
**Code List:** PB CU  
**Url:** [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10119036](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10119036)

**I1:** 81  
**Latitude:** 37.929688  
**Longitude:** -107.594788

**Commodity**

<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	22 ZN Zinc Metallic Zinc Tertiary	<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	5 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:21
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	22 AU Gold Metallic Gold Tertiary	<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	2 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:21
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	22 PB Lead Metallic Lead Primary	<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	3 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:21

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	22 AG Silver Metallic Silver Tertiary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	4 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:21
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	23 CU Copper Metallic Copper Tertiary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	1 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:21
<b><u>Names</u></b>						
<b>I1:</b> <b>Status:</b> <b>Site Name:</b> <b>Line:</b>	35 Current Little Ida 1				<b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	MAS migration 29-OCT-02 USGS 29-OCT-02
<a href="#">108</a>	1 of 1	ESE	0.76 / 4,010.79	12,046.04 / -78	CALEDONIAN SAN JUAN COUNTY SILVERTON CO 81433	MRDS
<b>Dep ID:</b> <b>Dev Status:</b> <b>Code List:</b> <b>Url:</b>	10017777 PRODUCER PB http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10017777			<b>I1:</b> <b>Latitude:</b> <b>Longitude:</b>	23 37.868713 -107.550903	
<b><u>Commodity</u></b>						
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	43 PB Lead Metallic Lead Primary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	1 MRDS migration 29-OCT-02 USGS 29-OCT-02
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	43 ZN Zinc Metallic Zinc Primary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	2 MRDS migration 29-OCT-02 USGS 29-OCT-02
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	43 CU Copper Metallic Copper Primary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	3 MRDS migration 29-OCT-02 USGS 29-OCT-02
<b><u>Names</u></b>						
<b>I1:</b> <b>Status:</b> <b>Site Name:</b> <b>Line:</b>	28 Current Caledonian 1				<b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	MRDS migration 29-OCT-02 USGS 29-OCT-02

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
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SILVERTON CO 81433

Dep ID:	10167815	I1:	24
Dev Status:	PAST PRODUCER	Latitude:	37.930298
Code List:	BI AU	Longitude:	-107.630005
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10167815		

Commodity

I1:	72	Line:	3
Code:	PB	Inserted By:	MAS migration
Commodity:	Lead	Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic	Updated By:	USGS
Commodity Group:	Lead	Update Date:	29-OCT-2002 09:01:39
Importance:	Tertiary		

I1:	72	Line:	4
Code:	AG	Inserted By:	MAS migration
Commodity:	Silver	Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic	Updated By:	USGS
Commodity Group:	Silver	Update Date:	29-OCT-2002 09:01:39
Importance:	Tertiary		

I1:	72	Line:	5
Code:	ZN	Inserted By:	MAS migration
Commodity:	Zinc	Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic	Updated By:	USGS
Commodity Group:	Zinc	Update Date:	29-OCT-2002 09:01:39
Importance:	Tertiary		

I1:	72	Line:	1
Code:	BI	Inserted By:	MAS migration
Commodity:	Bismuth	Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic	Updated By:	USGS
Commodity Group:	Bismuth	Update Date:	29-OCT-2002 09:01:39
Importance:	Primary		

I1:	36	Line:	2
Code:	AU	Inserted By:	MAS migration
Commodity:	Gold	Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic	Updated By:	USGS
Commodity Group:	Gold	Update Date:	29-OCT-2002 09:01:39
Importance:	Tertiary		

Names

I1:	24	Inserted By:	MAS migration
Status:	Current	Insert Date:	29-OCT-02
Site Name:	Acapulca	Updated By:	USGS
Line:	1	Update Date:	29-OCT-02

<a href="#">110</a>	1 of 1	NNW	0.75 / 3,961.52	12,216.07 / 92	ACAPULCA SAN JUAN COUNTY SILVERTON CO 81433	MRDS
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Dep ID:	10018637	I1:	26
Dev Status:	OCCURRENCE	Latitude:	37.931091
Code List:	BI	Longitude:	-107.630005
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10018637		

Commodity

I1:	11	Line:	1
Code:	BI	Inserted By:	MRDS migration



Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Commodity:</b> Bismuth <b>Commodity Type:</b> Metallic <b>Commodity Group:</b> Bismuth <b>Importance:</b> Primary  <b>Names</b>  <b>I1:</b> 28 <b>Status:</b> Current <b>Site Name:</b> Acapulca <b>Line:</b> 1						
<b>Insert Date:</b> 29-OCT-2002 09:00:24 <b>Updated By:</b> USGS <b>Update Date:</b> 29-OCT-2002 09:00:34  <b>Inserted By:</b> MRDS migration <b>Insert Date:</b> 29-OCT-02 <b>Updated By:</b> USGS <b>Update Date:</b> 29-OCT-02						
<a href="#">111</a>	1 of 1	NNW	0.71 / 3,763.56	12,418.26 / 294	ALASKA SAN JUAN COUNTY SILVERTON CO 81433	MRDS
<b>Dep ID:</b> 10108449 <b>Dev Status:</b> PRODUCER <b>Code List:</b> AG <b>Url:</b> <a href="http://mrddata.usgs.gov/mrds/show-mrds.php?dep_id=10108449">http://mrddata.usgs.gov/mrds/show-mrds.php?dep_id=10108449</a>  <b>Commodity</b>  <b>I1:</b> 30 <b>Code:</b> AG <b>Commodity:</b> Silver <b>Commodity Type:</b> Metallic <b>Commodity Group:</b> Silver <b>Importance:</b> Primary  <b>I1:</b> 30 <b>Code:</b> ZN <b>Commodity:</b> Zinc <b>Commodity Type:</b> Metallic <b>Commodity Group:</b> Zinc <b>Importance:</b> Primary  <b>I1:</b> 30 <b>Code:</b> PB <b>Commodity:</b> Lead <b>Commodity Type:</b> Metallic <b>Commodity Group:</b> Lead <b>Importance:</b> Primary						
<b>Line:</b> 1 <b>Inserted By:</b> MRDS migration <b>Insert Date:</b> 29-OCT-2002 09:00:24 <b>Updated By:</b> USGS <b>Update Date:</b> 29-OCT-2002 09:01:16  <b>Line:</b> 3 <b>Inserted By:</b> MRDS migration <b>Insert Date:</b> 29-OCT-2002 09:00:24 <b>Updated By:</b> USGS <b>Update Date:</b> 29-OCT-2002 09:01:16  <b>Line:</b> 2 <b>Inserted By:</b> MRDS migration <b>Insert Date:</b> 29-OCT-2002 09:00:24 <b>Updated By:</b> USGS <b>Update Date:</b> 29-OCT-2002 09:01:16						
<b>Materials</b>  <b>I1:</b> 69 <b>Material:</b> Quartz <b>Ore or Gangue:</b> Ore <b>Rec:</b> 1  <b>Inserted B:</b> MRDS migration <b>Insert Dat:</b> 29-OCT-2002 09:44:3 <b>Updated By:</b> <b>Update Dat:</b>						
<b>Names</b>  <b>I1:</b> 31 <b>Status:</b> Current <b>Site Name:</b> Alaska <b>Line:</b> 1  <b>Inserted By:</b> MRDS migration <b>Insert Date:</b> 29-OCT-02 <b>Updated By:</b> USGS <b>Update Date:</b> 29-OCT-02						
<a href="#">112</a>	1 of 1	SSW	0.48 / 2,542.72	10,948.00 / -1,176	VALLEY FORGE MINE SAN JUAN COUNTY SILVERTON CO 81433	MRDS

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
Dep ID:	10288746			I1:	79	
Dev Status:	PROSPECT			Latitude:	37.838928	
Code List:	CU			Longitude:	-107.637024	
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10288746					
<u>Commodity</u>						
I1:	35			Line:	3	
Code:	ZN			Inserted By:	MAS migration	
Commodity:	Zinc			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Zinc			Update Date:	29-OCT-2002 09:02:30	
Importance:	Tertiary					
I1:	35			Line:	1	
Code:	CU			Inserted By:	MAS migration	
Commodity:	Copper			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Copper			Update Date:	29-OCT-2002 09:02:30	
Importance:	Tertiary					
I1:	35			Line:	2	
Code:	PB			Inserted By:	MAS migration	
Commodity:	Lead			Insert Date:	29-OCT-2002 09:00:24	
Commodity Type:	Metallic			Updated By:	USGS	
Commodity Group:	Lead			Update Date:	29-OCT-2002 09:02:30	
Importance:	Tertiary					
<u>Names</u>						
I1:	14			Inserted By:	MAS migration	
Status:	Current			Insert Date:	29-OCT-02	
Site Name:	Valley Forge Mine			Updated By:	USGS	
Line:	1			Update Date:	29-OCT-02	

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ESE

0.88 /  
4,663.9411,667.38 /  
-457OCCIDENT TUN  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

**Dep ID:** 10192209  
**Dev Status:** OCCURRENCE  
**Code List:** AU CU  
**Url:** http://mrdata.usgs.gov/mrds/show-mrds.php?dep\_id=10192209

**I1:** 10  
**Latitude:** 37.868286  
**Longitude:** -107.548706

**Commodity**

**I1:** 25  
**Code:** ZN  
**Commodity:** Zinc  
**Commodity Type:** Metallic  
**Commodity Group:** Zinc  
**Importance:** Tertiary

**Line:** 5  
**Inserted By:** MAS migration  
**Insert Date:** 29-OCT-2002 09:00:24  
**Updated By:** USGS  
**Update Date:** 29-OCT-2002 09:01:48

**I1:** 25  
**Code:** AG  
**Commodity:** Silver  
**Commodity Type:** Metallic  
**Commodity Group:** Silver  
**Importance:** Tertiary

**Line:** 4  
**Inserted By:** MAS migration  
**Insert Date:** 29-OCT-2002 09:00:24  
**Updated By:** USGS  
**Update Date:** 29-OCT-2002 09:01:48

**I1:** 19  
**Code:** CU  
**Commodity:** Copper  
**Commodity Type:** Metallic

**Line:** 1  
**Inserted By:** MAS migration  
**Insert Date:** 29-OCT-2002 09:00:24  
**Updated By:** USGS

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Commodity Group:</b>	Copper				<b>Update Date:</b>	29-OCT-2002 09:02:38
<b>Importance:</b>	Tertiary					
<b>I1:</b>	25				<b>Line:</b>	3
<b>Code:</b>	PB				<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Lead				<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic				<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Lead				<b>Update Date:</b>	29-OCT-2002 09:01:48
<b>Importance:</b>	Tertiary					
<b>I1:</b>	25				<b>Line:</b>	2
<b>Code:</b>	AU				<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Gold				<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic				<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Gold				<b>Update Date:</b>	29-OCT-2002 09:01:48
<b>Importance:</b>	Primary					
<b><u>Names</u></b>						
<b>I1:</b>	24				<b>Inserted By:</b>	MAS migration
<b>Status:</b>	Current				<b>Insert Date:</b>	29-OCT-02
<b>Site Name:</b>	Occident Tun				<b>Updated By:</b>	USGS
<b>Line:</b>	1				<b>Update Date:</b>	29-OCT-02

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1 of 1

NNW

0.96 /  
5,043.5111,732.77 /  
-391STAR OF THE WEST  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

**Dep ID:** 10264573  
**Dev Status:** PAST PRODUCER  
**Code List:** AU AG  
**Url:** [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10264573](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10264573)

**I1:** 86  
**Latitude:** 37.933289  
**Longitude:** -107.625

**Commodity**

<b>I1:</b>	35	<b>Line:</b>	3
<b>Code:</b>	AG	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Silver	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Silver	<b>Update Date:</b>	29-OCT-2002 09:02:20
<b>Importance:</b>	Tertiary		
<b>I1:</b>	18	<b>Line:</b>	1
<b>Code:</b>	AU	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Gold	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Gold	<b>Update Date:</b>	29-OCT-2002 09:02:20
<b>Importance:</b>	Primary		
<b>I1:</b>	35	<b>Line:</b>	4
<b>Code:</b>	ZN	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Zinc	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Zinc	<b>Update Date:</b>	29-OCT-2002 09:02:20
<b>Importance:</b>	Tertiary		

**Names**

<b>I1:</b>	35	<b>Inserted By:</b>	MAS migration
<b>Status:</b>	Current	<b>Insert Date:</b>	29-OCT-02
<b>Site Name:</b>	Star of the West	<b>Updated By:</b>	USGS
<b>Line:</b>	1	<b>Update Date:</b>	29-OCT-02

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<a href="#">115</a>	1 of 1	ESE	0.99 / 5,222.79	11,071.67 / -1,052	UNKNOWN SAN JUAN COUNTY SILVERTON CO 81433	MRDS

**Dep ID:** 10192286  
**Dev Status:** UNKNOWN  
**Code List:** ZN CU  
**Url:** [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10192286](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10192286)  
**I1:** 36  
**Latitude:** 37.865112  
**Longitude:** -107.548096

#### Commodity

**I1:** 23  
**Code:** PB  
**Commodity:** Lead  
**Commodity Type:** Metallic  
**Commodity Group:** Lead  
**Importance:** Tertiary  
**Line:** 3  
**Inserted By:** MAS migration  
**Insert Date:** 29-OCT-2002 09:00:24  
**Updated By:** USGS  
**Update Date:** 29-OCT-2002 09:01:48

**I1:** 23  
**Code:** AG  
**Commodity:** Silver  
**Commodity Type:** Metallic  
**Commodity Group:** Silver  
**Importance:** Tertiary  
**Line:** 4  
**Inserted By:** MAS migration  
**Insert Date:** 29-OCT-2002 09:00:24  
**Updated By:** USGS  
**Update Date:** 29-OCT-2002 09:01:48

**I1:** 23  
**Code:** CU  
**Commodity:** Copper  
**Commodity Type:** Metallic  
**Commodity Group:** Copper  
**Importance:** Tertiary  
**Line:** 1  
**Inserted By:** MAS migration  
**Insert Date:** 29-OCT-2002 09:00:24  
**Updated By:** USGS  
**Update Date:** 29-OCT-2002 09:01:48

**I1:** 23  
**Code:** ZN  
**Commodity:** Zinc  
**Commodity Type:** Metallic  
**Commodity Group:** Zinc  
**Importance:** Primary  
**Line:** 5  
**Inserted By:** MAS migration  
**Insert Date:** 29-OCT-2002 09:00:24  
**Updated By:** USGS  
**Update Date:** 29-OCT-2002 09:01:48

**I1:** 23  
**Code:** AU  
**Commodity:** Gold  
**Commodity Type:** Metallic  
**Commodity Group:** Gold  
**Importance:** Tertiary  
**Line:** 2  
**Inserted By:** MAS migration  
**Insert Date:** 29-OCT-2002 09:00:24  
**Updated By:** USGS  
**Update Date:** 29-OCT-2002 09:01:48

#### Names

**I1:** 23  
**Status:** Current  
**Site Name:** Unknown  
**Line:** 1  
**Inserted By:** MAS migration  
**Insert Date:** 29-OCT-02  
**Updated By:** USGS  
**Update Date:** 29-OCT-02

<a href="#">116</a>	1 of 1	SSW	0.10 / 553.66	10,514.43 / -1,610	UNKNOWN SAN JUAN COUNTY SILVERTON CO 81433	MRDS
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**Dep ID:** 10191931  
**Dev Status:** UNKNOWN  
**Code List:** ZN CU  
**Url:** [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10191931](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10191931)  
**I1:** 52  
**Latitude:** 37.832886  
**Longitude:** -107.626709

#### Commodity

**I1:** 33  
**Line:** 2

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Code:</b>	AU				<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Gold				<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic				<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Gold				<b>Update Date:</b>	29-OCT-2002 09:01:48
<b>Importance:</b>	Tertiary					
<b>I1:</b>	33				<b>Line:</b>	3
<b>Code:</b>	PB				<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Lead				<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic				<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Lead				<b>Update Date:</b>	29-OCT-2002 09:01:48
<b>Importance:</b>	Tertiary					
<b>I1:</b>	33				<b>Line:</b>	5
<b>Code:</b>	ZN				<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Zinc				<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic				<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Zinc				<b>Update Date:</b>	29-OCT-2002 09:01:48
<b>Importance:</b>	Primary					
<b>I1:</b>	33				<b>Line:</b>	1
<b>Code:</b>	CU				<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Copper				<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic				<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Copper				<b>Update Date:</b>	29-OCT-2002 09:01:48
<b>Importance:</b>	Tertiary					
<b>I1:</b>	33				<b>Line:</b>	4
<b>Code:</b>	AG				<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Silver				<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic				<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Silver				<b>Update Date:</b>	29-OCT-2002 09:01:48
<b>Importance:</b>	Tertiary					
<b><u>Names</u></b>						
<b>I1:</b>	24				<b>Inserted By:</b>	MAS migration
<b>Status:</b>	Current				<b>Insert Date:</b>	29-OCT-02
<b>Site Name:</b>	Unknown				<b>Updated By:</b>	USGS
<b>Line:</b>	1				<b>Update Date:</b>	29-OCT-02

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NNW

0.97 /  
5,134.05

12,125.59 /  
1

ALASKA  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

**Dep ID:** 10288721  
**Dev Status:** PAST PRODUCER  
**Code List:** AG PB  
**Url:** [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10288721](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10288721)

**I1:** 16  
**Latitude:** 37.934326  
**Longitude:** -107.631226

**Commodity**

<b>I1:</b>	35	<b>Line:</b>	3
<b>Code:</b>	ZN	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Zinc	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Zinc	<b>Update Date:</b>	29-OCT-2002 09:02:30
<b>Importance:</b>	Tertiary		
<b>I1:</b>	14	<b>Line:</b>	2
<b>Code:</b>	AG	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Silver	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Silver	<b>Update Date:</b>	29-OCT-2002 09:02:41
<b>Importance:</b>	Primary		



Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	35 PB Lead Metallic Lead Tertiary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	1 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:02:30
<b><u>Names</u></b>						
<b>I1:</b> <b>Status:</b> <b>Site Name:</b> <b>Line:</b>	24 Current Alaska 1				<b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	MAS migration 29-OCT-02 USGS 29-OCT-02

<a href="#">118</a>	1 of 1	NNW	1.00 / 5,271.42	12,043.23 / -81	SAXON SAN JUAN COUNTY SILVERTON CO 81433	MRDS
<b>Dep ID:</b> <b>Dev Status:</b> <b>Code List:</b> <b>Url:</b>	10018639 PRODUCER PB <a href="http://mrddata.usgs.gov/mrds/show-mrds.php?dep_id=10018639">http://mrddata.usgs.gov/mrds/show-mrds.php?dep_id=10018639</a>			<b>I1:</b> <b>Latitude:</b> <b>Longitude:</b>	63 37.934692 -107.630005	

### **Commodity**

<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	12 ZN Zinc Metallic Zinc Primary			<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	2 MRDS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:00:34
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	12 AG Silver Metallic Silver Primary			<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	4 MRDS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:00:34
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	12 PB Lead Metallic Lead Primary			<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	1 MRDS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:00:34
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	12 CU Copper Metallic Copper Primary			<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	3 MRDS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:00:34

### **Materials**

<b>I1:</b> <b>Material:</b> <b>Ore or Gangue:</b> <b>Rec:</b>	17 Chalcopyrite Ore 1			<b>Inserted B:</b> <b>Insert Dat:</b> <b>Updated By:</b> <b>Update Dat:</b>	MRDS migration 29-OCT-2002 09:44:3
<b>I1:</b> <b>Material:</b> <b>Ore or Gangue:</b> <b>Rec:</b>	69 Galena Ore 2			<b>Inserted B:</b> <b>Insert Dat:</b> <b>Updated By:</b> <b>Update Dat:</b>	MRDS migration 29-OCT-2002 09:44:3

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
I1: Material: Ore or Gangue: Rec:	69 Sphalerite Ore 3				Inserted B: Insert Dat: Updated By: Update Dat:	MRDS migration 29-OCT-2002 09:44:3
<u>Names</u>						
I1: Status: Site Name: Line:	28 Current Saxon 1				Inserted By: Insert Date: Updated By: Update Date:	MRDS migration 29-OCT-02 USGS 29-OCT-02
<a href="#">119</a>	1 of 1	SSW	0.25 / 1,319.08	10,197.39 / -1,927	MAXWELL SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID: Dev Status: Code List: Url:	10118765 PAST PRODUCER CU PB http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10118765			I1: Latitude: Longitude:	12 37.831482 -107.624207	
<u>Commodity</u>						
I1: Code: Commodity: Commodity Type: Commodity Group: Importance:	20 CU Copper Metallic Copper Primary			Line: Inserted By: Insert Date: Updated By: Update Date:	1 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:21	
I1: Code: Commodity: Commodity Type: Commodity Group: Importance:	20 ZN Zinc Metallic Zinc Tertiary			Line: Inserted By: Insert Date: Updated By: Update Date:	3 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:21	
I1: Code: Commodity: Commodity Type: Commodity Group: Importance:	36 PB Lead Metallic Lead Tertiary			Line: Inserted By: Insert Date: Updated By: Update Date:	2 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:21	
<u>Names</u>						
I1: Status: Site Name: Line:	35 Current Maxwell 1				Inserted By: Insert Date: Updated By: Update Date:	MAS migration 29-OCT-02 USGS 29-OCT-02

<a href="#">120</a>	1 of 1	SSW	0.27 / 1,430.71	10,109.81 / -2,014	UNKNOWN SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID:	10288905			I1:	28	
Dev Status:	UNKNOWN			Latitude:	37.832275	
Code List:	ZN CU			Longitude:	-107.637817	
Uri:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10288905					
Commodity						

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	36 PB Lead Metallic Lead Tertiary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	3 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:02:30
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	36 AG Silver Metallic Silver Tertiary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	4 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:02:30
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	36 ZN Zinc Metallic Zinc Primary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	5 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:02:30
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	19 AU Gold Metallic Gold Tertiary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	2 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:02:41
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	36 CU Copper Metallic Copper Tertiary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	1 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:02:30
<b>Names</b>						
<b>I1:</b> <b>Status:</b> <b>Site Name:</b> <b>Line:</b>	24 Current Unknown 1				<b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	MAS migration 29-OCT-02 USGS 29-OCT-02

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S

0.59 /  
3,127.81

9,573.77 /  
-2,550

UNKNOWN  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

**Dep ID:** 10143041  
**Dev Status:** UNKNOWN  
**Code List:** ZN CU  
**Url:** [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10143041](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10143041)

**I1:** 38  
**Latitude:** 37.826904  
**Longitude:** -107.618408

#### Commodity

<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	12 CU Copper Metallic Copper Tertiary	<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	1 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:30
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b>	12 AU Gold Metallic Gold	<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	2 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:30

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Importance:</b>		Tertiary				
<b>I1:</b>	12			<b>Line:</b>	5	
<b>Code:</b>	ZN			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Zinc			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Zinc			<b>Update Date:</b>	29-OCT-2002 09:01:30	
<b>Importance:</b>	Primary					
<b>I1:</b>	12			<b>Line:</b>	3	
<b>Code:</b>	PB			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Lead			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Lead			<b>Update Date:</b>	29-OCT-2002 09:01:30	
<b>Importance:</b>	Tertiary					
<b>I1:</b>	12			<b>Line:</b>	4	
<b>Code:</b>	AG			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Silver			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Silver			<b>Update Date:</b>	29-OCT-2002 09:01:30	
<b>Importance:</b>	Tertiary					
<b><u>Names</u></b>						
<b>I1:</b>	24			<b>Inserted By:</b>	MAS migration	
<b>Status:</b>	Current			<b>Insert Date:</b>	29-OCT-02	
<b>Site Name:</b>	Unknown			<b>Updated By:</b>	USGS	
<b>Line:</b>	2			<b>Update Date:</b>	29-OCT-02	

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SSW

0.07 /  
352.14

9,587.43 /  
-2,537

MAYFLOWER MILL  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

**Dep ID:** 10288826  
**Dev Status:** PAST PRODUCER  
**Code List:** AU PB  
**Uri:** [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10288826](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10288826)

**I1:** 17  
**Latitude:** 37.828125  
**Longitude:** -107.628113

**Commodity**

**I1:** 15  
**Code:** AU  
**Commodity:** Gold  
**Commodity Type:** Metallic  
**Commodity Group:** Gold  
**Importance:** Primary

**Line:** 1  
**Inserted By:** MAS migration  
**Insert Date:** 29-OCT-2002 09:00:24  
**Updated By:** USGS  
**Update Date:** 29-OCT-2002 09:02:30

**I1:** 15  
**Code:** PB  
**Commodity:** Lead  
**Commodity Type:** Metallic  
**Commodity Group:** Lead  
**Importance:** Tertiary

**Line:** 2  
**Inserted By:** MAS migration  
**Insert Date:** 29-OCT-2002 09:00:24  
**Updated By:** USGS  
**Update Date:** 29-OCT-2002 09:02:30

**I1:** 15  
**Code:** AG  
**Commodity:** Silver  
**Commodity Type:** Metallic  
**Commodity Group:** Silver  
**Importance:** Tertiary

**Line:** 3  
**Inserted By:** MAS migration  
**Insert Date:** 29-OCT-2002 09:00:24  
**Updated By:** USGS  
**Update Date:** 29-OCT-2002 09:02:30

**Names**

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
I1:	35				Inserted By:	MAS migration
Status:	Current				Insert Date:	29-OCT-02
Site Name:	Mayflower Mill				Updated By:	USGS
Line:	1				Update Date:	29-OCT-02

[123](#)

1 of 1

SSW

0.55 /  
2,913.829,915.54 /  
-2,209UNKNOWN  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

Dep ID: 10289254  
 Dev Status: UNKNOWN  
 Code List: ZN CU  
 Url: [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10289254](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10289254)

I1: 12  
 Latitude: 37.820313  
 Longitude: -107.623901

#### Commodity

I1: 18  
 Code: AG  
 Commodity: Silver  
 Commodity Type: Metallic  
 Commodity Group: Silver  
 Importance: Tertiary

Line: 4  
 Inserted By: MAS migration  
 Insert Date: 29-OCT-2002 09:00:24  
 Updated By: USGS  
 Update Date: 29-OCT-2002 09:02:30

I1: 15  
 Code: PB  
 Commodity: Lead  
 Commodity Type: Metallic  
 Commodity Group: Lead  
 Importance: Tertiary

Line: 3  
 Inserted By: MAS migration  
 Insert Date: 29-OCT-2002 09:00:24  
 Updated By: USGS  
 Update Date: 29-OCT-2002 09:02:30

I1: 15  
 Code: ZN  
 Commodity: Zinc  
 Commodity Type: Metallic  
 Commodity Group: Zinc  
 Importance: Primary

Line: 5  
 Inserted By: MAS migration  
 Insert Date: 29-OCT-2002 09:00:24  
 Updated By: USGS  
 Update Date: 29-OCT-2002 09:02:30

I1: 15  
 Code: CU  
 Commodity: Copper  
 Commodity Type: Metallic  
 Commodity Group: Copper  
 Importance: Tertiary

Line: 1  
 Inserted By: MAS migration  
 Insert Date: 29-OCT-2002 09:00:24  
 Updated By: USGS  
 Update Date: 29-OCT-2002 09:02:30

I1: 15  
 Code: AU  
 Commodity: Gold  
 Commodity Type: Metallic  
 Commodity Group: Gold  
 Importance: Tertiary

Line: 2  
 Inserted By: MAS migration  
 Insert Date: 29-OCT-2002 09:00:24  
 Updated By: USGS  
 Update Date: 29-OCT-2002 09:02:30

#### Names

I1: 24  
 Status: Current  
 Site Name: Unknown  
 Line: 1

Inserted By: MAS migration  
 Insert Date: 29-OCT-02  
 Updated By: USGS  
 Update Date: 29-OCT-02

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SSW

0.57 /  
2,999.169,894.36 /  
-2,230VALLEY FORGE GROUP  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

Dep ID: 10018502  
 Dev Status: OCCURRENCE  
 Code List: PB

I1: 54  
 Latitude: 37.820129  
 Longitude: -107.623718



Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
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Url: [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10018502](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10018502)

#### Commodity

I1:	29	Line:	3
Code:	CU	Inserted By:	MRDS migration
Commodity:	Copper	Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic	Updated By:	USGS
Commodity Group:	Copper	Update Date:	29-OCT-2002 09:00:34
Importance:	Primary		
I1:	29	Line:	1
Code:	PB	Inserted By:	MRDS migration
Commodity:	Lead	Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic	Updated By:	USGS
Commodity Group:	Lead	Update Date:	29-OCT-2002 09:00:34
Importance:	Primary		
I1:	29	Line:	2
Code:	ZN	Inserted By:	MRDS migration
Commodity:	Zinc	Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic	Updated By:	USGS
Commodity Group:	Zinc	Update Date:	29-OCT-2002 09:00:34
Importance:	Primary		

#### Names

I1:	91	Inserted By:	MRDS migration
Status:	Current	Insert Date:	29-OCT-02
Site Name:	Valley Forge Group	Updated By:	USGS
Line:	1	Update Date:	29-OCT-02

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SSW

0.24 /  
1,245.62

9,763.42 /  
-2,361

ASPEN MINE  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

Dep ID:	10215928	I1:	13
Dev Status:	PAST PRODUCER	Latitude:	37.821472
Code List:	PB CU	Longitude:	-107.631409
Url:	<a href="http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10215928">http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10215928</a>		

#### Commodity

I1:	24	Line:	2
Code:	AU	Inserted By:	MAS migration
Commodity:	Gold	Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic	Updated By:	USGS
Commodity Group:	Gold	Update Date:	29-OCT-2002 09:01:57
Importance:	Tertiary		
I1:	24	Line:	1
Code:	CU	Inserted By:	MAS migration
Commodity:	Copper	Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic	Updated By:	USGS
Commodity Group:	Copper	Update Date:	29-OCT-2002 09:01:57
Importance:	Tertiary		
I1:	24	Line:	4
Code:	AG	Inserted By:	MAS migration
Commodity:	Silver	Insert Date:	29-OCT-2002 09:00:24
Commodity Type:	Metallic	Updated By:	USGS
Commodity Group:	Silver	Update Date:	29-OCT-2002 09:01:57
Importance:	Tertiary		

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	13 ZN Zinc Metallic Zinc Tertiary			<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	5 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:57	
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	24 PB Lead Metallic Lead Primary			<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	3 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:57	
<b><u>Names</u></b>						
<b>I1:</b> <b>Status:</b> <b>Site Name:</b> <b>Line:</b>	79 Previous Legal Tender 2			<b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	MAS migration 29-OCT-02 USGS 29-OCT-02	
<b><u>Names</u></b>						
<b>I1:</b> <b>Status:</b> <b>Site Name:</b> <b>Line:</b>	24 Current Aspen Mine 1			<b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	MAS migration 29-OCT-02 USGS 29-OCT-02	

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SSW

0.27 /  
1,435.91

9,914.12 /  
-2,210

ASPEN  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

**Dep ID:** 10108415  
**Dev Status:** PRODUCER  
**Code List:** PB  
**Url:** [http://mrddata.usgs.gov/mrds/show-mrds.php?dep\\_id=10108415](http://mrddata.usgs.gov/mrds/show-mrds.php?dep_id=10108415)

**I1:** 13  
**Latitude:** 37.820923  
**Longitude:** -107.631226

**Commodity**

<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	29 CU Copper Metallic Copper Primary	<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	3 MRDS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:16
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	29 AG Silver Metallic Silver Primary	<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	2 MRDS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:16
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	29 PB Lead Metallic Lead Primary	<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	1 MRDS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:16
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b>	29 ZN Zinc Metallic	<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b>	4 MRDS migration 29-OCT-2002 09:00:24 USGS

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Commodity Group:</b> <b>Importance:</b>		Zinc Primary			<b>Update Date:</b>	29-OCT-2002 09:01:16
<b><u>Materials</u></b>						
<b>I1:</b> <b>Material:</b> <b>Ore or Gangue:</b> <b>Rec:</b>	12 Silver Ore 4				<b>Inserted B:</b> <b>Insert Dat:</b> <b>Updated By:</b> <b>Update Dat:</b>	MRDS migration 29-OCT-2002 09:44:3
<b>I1:</b> <b>Material:</b> <b>Ore or Gangue:</b> <b>Rec:</b>	48 Sphalerite Ore 5				<b>Inserted B:</b> <b>Insert Dat:</b> <b>Updated By:</b> <b>Update Dat:</b>	MRDS migration 29-OCT-2002 09:44:3
<b>I1:</b> <b>Material:</b> <b>Ore or Gangue:</b> <b>Rec:</b>	12 Galena Ore 2				<b>Inserted B:</b> <b>Insert Dat:</b> <b>Updated By:</b> <b>Update Dat:</b>	MRDS migration 29-OCT-2002 09:44:3
<b>I1:</b> <b>Material:</b> <b>Ore or Gangue:</b> <b>Rec:</b>	77 Pyrite Ore 3				<b>Inserted B:</b> <b>Insert Dat:</b> <b>Updated By:</b> <b>Update Dat:</b>	MRDS migration 29-OCT-2002 09:44:3
<b>I1:</b> <b>Material:</b> <b>Ore or Gangue:</b> <b>Rec:</b>	83 Chalcopyrite Ore 1				<b>Inserted B:</b> <b>Insert Dat:</b> <b>Updated By:</b> <b>Update Dat:</b>	MRDS migration 29-OCT-2002 09:44:3
<b>I1:</b> <b>Material:</b> <b>Ore or Gangue:</b> <b>Rec:</b>	77 Tetrahedrite Ore 6				<b>Inserted B:</b> <b>Insert Dat:</b> <b>Updated By:</b> <b>Update Dat:</b>	MRDS migration 29-OCT-2002 09:44:3
<b><u>Names</u></b>						
<b>I1:</b> <b>Status:</b> <b>Site Name:</b> <b>Line:</b>	12 Current Aspen 1				<b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	MRDS migration 29-OCT-02 USGS 29-OCT-02

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SSW

0.00 /  
0.00

9,401.59 /  
-2,723

CLOSED SILVERTON LANDFILL  
APPROXIMATELY 1 MILE EAST  
OF TOWN  
SILVERTON CO

SWF/LF

Loc ID: SAJ3

**Facility Detail Info**

**Location ID:** SAJ 3498  
**Facility Name:** CLOSED SILVERTON LANDFILL  
**Location Address:** APPROXIMATELY 1 MILE EAST OF TOWN  
**City:** SILVERTON  
**Zip:** 81520  
**County Name:** SAN JUAN  
**Latitude:** 37.820984  
**Longitude:** -107.644819

**Facility Map Info (REST)**

Location ID: SAJ 3498

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>FID:</b>		2430				
<b>Primary AC:</b>		Landfill				
<b>Facility Name:</b>		CLOSED SILVERTON LANDFILL				
<b>Address:</b>		APPROXIMATELY 1 MILE EAST OF TOWN				
<b>City:</b>		SILVERTON				
<b>Zip:</b>		81520				
<b>County Name:</b>		SAN JUAN				
<b>Latitude:</b>		37.8209847174				
<b>Longitude:</b>		-107.644819054				
<b><u>Activity Info</u></b>						
<b>Activity Type:</b>		Landfill - Municipal Waste				
<b>Closure Units:</b>		FALSE				
<b>Post Closure Units:</b>		FALSE				
<b>Post Closure Ended:</b>		FALSE				
<b>Clean Closed Units:</b>		FALSE				
<b>Activity Type:</b>		Landfill				
<b>Closure Units:</b>		FALSE				
<b>Post Closure Units:</b>		TRUE				
<b>Post Closure Ended:</b>		FALSE				
<b>Clean Closed Units:</b>		FALSE				

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SSW

0.18 /  
957.089,740.11 /  
-2,384UNKNOWN  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

<b>Dep ID:</b>	10240506	<b>I1:</b>	96
<b>Dev Status:</b>	UNKNOWN	<b>Latitude:</b>	37.817322
<b>Code List:</b>	ZN CU	<b>Longitude:</b>	-107.640808
<b>Url:</b>	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10240506		

**Commodity**

<b>I1:</b>	73	<b>Line:</b>	1
<b>Code:</b>	CU	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Copper	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Copper	<b>Update Date:</b>	29-OCT-2002 09:02:09
<b>Importance:</b>	Tertiary		
<b>I1:</b>	15	<b>Line:</b>	3
<b>Code:</b>	PB	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Lead	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Lead	<b>Update Date:</b>	29-OCT-2002 09:02:40
<b>Importance:</b>	Tertiary		
<b>I1:</b>	73	<b>Line:</b>	2
<b>Code:</b>	AU	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Gold	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Gold	<b>Update Date:</b>	29-OCT-2002 09:02:09
<b>Importance:</b>	Tertiary		
<b>I1:</b>	73	<b>Line:</b>	5
<b>Code:</b>	ZN	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Zinc	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Zinc	<b>Update Date:</b>	29-OCT-2002 09:02:09
<b>Importance:</b>	Primary		
<b>I1:</b>	73	<b>Line:</b>	4
<b>Code:</b>	AG	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Silver	<b>Insert Date:</b>	29-OCT-2002 09:00:24

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Commodity Type:</b> Metallic					<b>Updated By:</b> USGS	
<b>Commodity Group:</b> Silver					<b>Update Date:</b> 29-OCT-2002 09:02:09	
<b>Importance:</b> Tertiary						
<b><u>Names</u></b>						
<b>I1:</b>	24				<b>Inserted By:</b> MAS migration	
<b>Status:</b>	Current				<b>Insert Date:</b> 29-OCT-02	
<b>Site Name:</b>	Unknown				<b>Updated By:</b> USGS	
<b>Line:</b>	1				<b>Update Date:</b> 29-OCT-02	

[129](#) 1 of 1 SSW 0.36 / 1,901.81 10,176.61 / -1,948 UNKNOWN SAN JUAN COUNTY SILVERTON CO 81433 MRDS

**Dep ID:** 10281162 **I1:** 70  
**Dev Status:** UNKNOWN **Latitude:** 37.8125  
**Code List:** ZN CU **Longitude:** -107.64563  
**Url:** [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10281162](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10281162)

#### **Commodity**

<b>I1:</b>	96	<b>Line:</b>	5
<b>Code:</b>	ZN	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Zinc	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Zinc	<b>Update Date:</b>	29-OCT-2002 09:02:27
<b>Importance:</b>	Primary		
<b>I1:</b>	82	<b>Line:</b>	3
<b>Code:</b>	PB	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Lead	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Lead	<b>Update Date:</b>	29-OCT-2002 09:02:27
<b>Importance:</b>	Tertiary		
<b>I1:</b>	81	<b>Line:</b>	1
<b>Code:</b>	CU	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Copper	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Copper	<b>Update Date:</b>	29-OCT-2002 09:02:27
<b>Importance:</b>	Tertiary		
<b>I1:</b>	82	<b>Line:</b>	2
<b>Code:</b>	AU	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Gold	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Gold	<b>Update Date:</b>	29-OCT-2002 09:02:27
<b>Importance:</b>	Tertiary		
<b>I1:</b>	82	<b>Line:</b>	4
<b>Code:</b>	AG	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Silver	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Silver	<b>Update Date:</b>	29-OCT-2002 09:02:27
<b>Importance:</b>	Tertiary		

#### **Names**

<b>I1:</b>	24	<b>Inserted By:</b>	MAS migration
<b>Status:</b>	Current	<b>Insert Date:</b>	29-OCT-02
<b>Site Name:</b>	Unknown	<b>Updated By:</b>	USGS
<b>Line:</b>	1	<b>Update Date:</b>	29-OCT-02



Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<a href="#">130</a>	1 of 1	SSW	0.55 / 2,900.72	10,621.21 / -1,503	LACKAWANNA MINE SAN JUAN COUNTY SILVERTON CO 81433	MRDS

**Dep ID:** 10108414  
**Dev Status:** PRODUCER  
**Code List:** PB  
**Url:** [http://mrddata.usgs.gov/mrds/show-mrds.php?dep\\_id=10108414](http://mrddata.usgs.gov/mrds/show-mrds.php?dep_id=10108414)  
**I1:** 20  
**Latitude:** 37.810913  
**Longitude:** -107.642395

#### Commodity

**I1:** 43  
**Code:** AU  
**Commodity:** Gold  
**Commodity Type:** Metallic  
**Commodity Group:** Gold  
**Importance:** Primary  
**Line:** 4  
**Inserted By:** MRDS migration  
**Insert Date:** 29-OCT-02  
**Updated By:** USGS  
**Update Date:** 29-OCT-02

**I1:** 44  
**Code:** PB  
**Commodity:** Lead  
**Commodity Type:** Metallic  
**Commodity Group:** Lead  
**Importance:** Primary  
**Line:** 1  
**Inserted By:** MRDS migration  
**Insert Date:** 29-OCT-02  
**Updated By:** USGS  
**Update Date:** 29-OCT-02

**I1:** 43  
**Code:** CU  
**Commodity:** Copper  
**Commodity Type:** Metallic  
**Commodity Group:** Copper  
**Importance:** Primary  
**Line:** 2  
**Inserted By:** MRDS migration  
**Insert Date:** 29-OCT-02  
**Updated By:** USGS  
**Update Date:** 29-OCT-02

**I1:** 43  
**Code:** AG  
**Commodity:** Silver  
**Commodity Type:** Metallic  
**Commodity Group:** Silver  
**Importance:** Primary  
**Line:** 5  
**Inserted By:** MRDS migration  
**Insert Date:** 29-OCT-02  
**Updated By:** USGS  
**Update Date:** 29-OCT-02

**I1:** 43  
**Code:** ZN  
**Commodity:** Zinc  
**Commodity Type:** Metallic  
**Commodity Group:** Zinc  
**Importance:** Primary  
**Line:** 3  
**Inserted By:** MRDS migration  
**Insert Date:** 29-OCT-02  
**Updated By:** USGS  
**Update Date:** 29-OCT-02

#### Materials

**I1:** 83  
**Material:** Tetrahedrite  
**Ore or Gangue:** Ore  
**Rec:** 4  
**Inserted B:** MRDS migration  
**Insert Dat:** 29-OCT-02  
**Updated By:**  
**Update Dat:**

**I1:** 83  
**Material:** Sphalerite  
**Ore or Gangue:** Ore  
**Rec:** 3  
**Inserted B:** MRDS migration  
**Insert Dat:** 29-OCT-02  
**Updated By:**  
**Update Dat:**

**I1:** 12  
**Material:** Galena  
**Ore or Gangue:** Ore  
**Rec:** 2  
**Inserted B:** MRDS migration  
**Insert Dat:** 29-OCT-02  
**Updated By:**  
**Update Dat:**

**I1:** 83  
**Material:** Chalcopyrite  
**Inserted B:** MRDS migration  
**Insert Dat:** 29-OCT-02

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<hr/>						
Ore or Gangue: Rec:	Ore 1				Updated By: Update Dat:	
 <u>Names</u>						
I1: Status: Site Name: Line:	12 Current Lackawanna Mine 1				Inserted By: Insert Date: Updated By: Update Date:	MRDS migration 29-OCT-02 USGS 29-OCT-02
 <u>Names</u>						
I1: Status: Site Name: Line:	12 Previous Osceola Mine 2				Inserted By: Insert Date: Updated By: Update Date:	MRDS migration 29-OCT-02 USGS 29-OCT-02
<hr/>						
<a href="#">131</a>	1 of 1	SSW	0.47 / 2,481.01	10,024.99 / -2,099	LACKAWANNA MINE SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID: Dev Status: Code List: Uri:	10118703 PAST PRODUCER PB CU http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10118703			I1: Latitude: Longitude:	52 37.809692 -107.648926	
 <u>Commodity</u>						
I1: Code: Commodity: Commodity Type: Commodity Group: Importance:	11 ZN Zinc Metallic Zinc Tertiary			Line: Inserted By: Insert Date: Updated By: Update Date:	5 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:21	
I1: Code: Commodity: Commodity Type: Commodity Group: Importance:	11 AG Silver Metallic Silver Tertiary			Line: Inserted By: Insert Date: Updated By: Update Date:	4 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:21	
I1: Code: Commodity: Commodity Type: Commodity Group: Importance:	11 AU Gold Metallic Gold Tertiary			Line: Inserted By: Insert Date: Updated By: Update Date:	2 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:21	
I1: Code: Commodity: Commodity Type: Commodity Group: Importance:	11 PB Lead Metallic Lead Primary			Line: Inserted By: Insert Date: Updated By: Update Date:	3 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:21	
I1: Code: Commodity: Commodity Type: Commodity Group: Importance:	35 CU Copper Metallic Copper Tertiary			Line: Inserted By: Insert Date: Updated By: Update Date:	1 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:21	

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<u>Names</u>						
I1:	24				Inserted By:	MAS migration
Status:	Current				Insert Date:	29-OCT-02
Site Name:	Lackawanna Mine				Updated By:	USGS
Line:	1				Update Date:	29-OCT-02
<a href="#">132</a>	1 of 1	SW	0.65 / 3,433.35	9,303.26 / -2,821	SILVERTON RESERVOIR BOG IRON DEPOSIT SAN JUAN COUNTY SILVERTON CO 81433	MRDS
Dep ID:	10018500				I1:	27
Dev Status:	PRODUCER				Latitude:	37.810913
Code List:	FE				Longitude:	-107.660583
Url:	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10018500					
<u>Commodity</u>						
I1:	39				Line:	1
Code:	FE				Inserted By:	MRDS migration
Commodity:	Iron				Insert Date:	29-OCT-02
Commodity Type:	Metallic				Updated By:	USGS
Commodity Group:	Iron				Update Date:	29-OCT-02
Importance:	Primary					
<u>Materials</u>						
I1:	83				Inserted B:	MRDS migration
Material:	Limonite				Insert Dat:	29-OCT-02
Ore or Gangue:	Ore				Updated By:	
Rec:	1				Update Dat:	
<u>Names</u>						
I1:	91				Inserted By:	MRDS migration
Status:	Current				Insert Date:	29-OCT-02
Site Name:	Silverton Reservoir Bog Iron Deposi				Updated By:	USGS
Line:	1				Update Date:	29-OCT-02

133

1 of 1

SW

0.81 /  
4,278.26

9,301.20 /  
-2,823

DORA  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

Dep ID:

Dev Status:

Code List:

Url:

10143211

PAST PRODUCER

PB CU

http://mrdata.usgs.gov/mrds/show-mrds.php?dep\_id=10143211

I1:

Latitude:

Longitude:

12

37.811096

-107.66449

Commodity

I1:

Code:

Commodity:

Commodity Type:

Commodity Group:

Importance:

22

CU

Copper

Metallic

Copper

Tertiary

Line:

Inserted By:

Insert Date:

Updated By:

Update Date:

1

MAS migration

29-OCT-2002 09:00:24

USGS

29-OCT-2002 09:01:30

I1:

Code:

Commodity:

Commodity Type:

25

AG

Silver

Metallic

Line:

Inserted By:

Insert Date:

Updated By:

4

MAS migration

29-OCT-2002 09:00:24

USGS

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Commodity Group:</b> <b>Importance:</b>	Silver Tertiary			<b>Update Date:</b>	29-OCT-2002 09:01:30	
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	25 ZN Zinc Metallic Zinc Tertiary			<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	5 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:30	
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	24 AU Gold Metallic Gold Tertiary			<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	2 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:30	
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	24 PB Lead Metallic Lead Primary			<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	3 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:30	
<b><u>Names</u></b>						
<b>I1:</b> <b>Status:</b> <b>Site Name:</b> <b>Line:</b>	34 Previous Little Dora, Hercules, Empire Group 3			<b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	MAS migration 29-OCT-02 USGS 29-OCT-02	
<b><u>Names</u></b>						
<b>I1:</b> <b>Status:</b> <b>Site Name:</b> <b>Line:</b>	34 Current Dora 1			<b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	MAS migration 29-OCT-02 USGS 29-OCT-02	

[134](#)

1 of 2

SSW

0.92 /  
4,875.949,405.68 /  
-2,718LITTLE DORA  
SAN JUAN COUNTY  
SILVERTON CO 81433

MRDS

**Dep ID:** 10018497  
**Dev Status:** PRODUCER  
**Code List:** W  
**Url:** [http://mrdata.usgs.gov/mrds/show-mrds.php?dep\\_id=10018497](http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10018497)

**I1:** 15  
**Latitude:** 37.805481  
**Longitude:** -107.660278

**Commodity**

<b>I1:</b>	10	<b>Line:</b>	1
<b>Code:</b>	W	<b>Inserted By:</b>	MRDS migration
<b>Commodity:</b>	Tungsten	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Tungsten	<b>Update Date:</b>	29-OCT-2002 09:00:34
<b>Importance:</b>	Primary		

**Materials**

<b>I1:</b>	57	<b>Inserted B:</b>	MRDS migration
<b>Material:</b>	Huebnerite	<b>Insert Dat:</b>	29-OCT-2002 09:44:3
<b>Ore or Gangue:</b>	Ore	<b>Updated By:</b>	
<b>Rec:</b>	1	<b>Update Dat:</b>	

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
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### Names

<b>I1:</b>	91	<b>Inserted By:</b>	MRDS migration
<b>Status:</b>	Current	<b>Insert Date:</b>	29-OCT-02
<b>Site Name:</b>	Little Dora	<b>Updated By:</b>	USGS
<b>Line:</b>	1	<b>Update Date:</b>	29-OCT-02

<a href="#">134</a>	2 of 2	SSW	0.92 / 4,875.94	9,405.68 / -2,718	CORNING WONDER MINE SAN JUAN COUNTY SILVERTON CO 81433	MRDS
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<b>Dep ID:</b>	10108413	<b>I1:</b>	99
<b>Dev Status:</b>	PRODUCER	<b>Latitude:</b>	37.805481
<b>Code List:</b>	PB	<b>Longitude:</b>	-107.660278
<b>Url:</b>	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10108413		

### Commodity

<b>I1:</b>	29	<b>Line:</b>	4
<b>Code:</b>	AG	<b>Inserted By:</b>	MRDS migration
<b>Commodity:</b>	Silver	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Silver	<b>Update Date:</b>	29-OCT-2002 09:01:16
<b>Importance:</b>	Primary		

<b>I1:</b>	29	<b>Line:</b>	2
<b>Code:</b>	CU	<b>Inserted By:</b>	MRDS migration
<b>Commodity:</b>	Copper	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Copper	<b>Update Date:</b>	29-OCT-2002 09:01:16
<b>Importance:</b>	Primary		

<b>I1:</b>	29	<b>Line:</b>	3
<b>Code:</b>	AU	<b>Inserted By:</b>	MRDS migration
<b>Commodity:</b>	Gold	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Gold	<b>Update Date:</b>	29-OCT-2002 09:01:16
<b>Importance:</b>	Primary		

<b>I1:</b>	29	<b>Line:</b>	1
<b>Code:</b>	PB	<b>Inserted By:</b>	MRDS migration
<b>Commodity:</b>	Lead	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Lead	<b>Update Date:</b>	29-OCT-2002 09:01:16
<b>Importance:</b>	Primary		

### Materials

<b>I1:</b>	12	<b>Inserted B:</b>	MRDS migration
<b>Material:</b>	Galena	<b>Insert Dat:</b>	29-OCT-2002 09:44:3
<b>Ore or Gangue:</b>	Ore	<b>Updated By:</b>	
<b>Rec:</b>	2	<b>Update Dat:</b>	

<b>I1:</b>	17	<b>Inserted B:</b>	MRDS migration
<b>Material:</b>	Chalcopyrite	<b>Insert Dat:</b>	29-OCT-2002 09:44:3
<b>Ore or Gangue:</b>	Ore	<b>Updated By:</b>	
<b>Rec:</b>	1	<b>Update Dat:</b>	

<b>I1:</b>	83	<b>Inserted B:</b>	MRDS migration
<b>Material:</b>	Pyrite	<b>Insert Dat:</b>	29-OCT-2002 09:44:3
<b>Ore or Gangue:</b>	Ore	<b>Updated By:</b>	
<b>Rec:</b>	3	<b>Update Dat:</b>	



Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
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Names

I1:	40	Inserted By:	MRDS migration
Status:	Previous	Insert Date:	29-OCT-02
Site Name:	Emerald Mine	Updated By:	USGS
Line:	2	Update Date:	29-OCT-02

Names

I1:	17	Inserted By:	MRDS migration
Status:	Current	Insert Date:	29-OCT-02
Site Name:	Corning Wonder Mine	Updated By:	USGS
Line:	1	Update Date:	29-OCT-02

<a href="#">135</a>	1 of 1	SSW	0.01 / 51.03	9,353.62 / -2,771	NEW SILVERTON TRANSFER STATION	SWF/LF
Silverton CO						

Loc ID: SAJ4

Facility Detail Info

Location ID:	SAJ 966
Facility Name:	NEW SILVERTON TRANSFER STATION
Location Address:	
City:	Silverton
Zip:	81433
County Name:	SAN JUAN
Latitude:	37.818749
Longitude:	-107.649213

Facility Map Info (REST)

Location ID:	SAJ 966
FID:	2431
Primary AC:	Transfer Station
Facility Name:	NEW SILVERTON TRANSFER STATION
Address:	
City:	Silverton
Zip:	81433
County Name:	SAN JUAN
Latitude:	37.8187495644
Longitude:	-107.649213855

Activity Info

Activity Type:	Transfer Station
Closure Units:	FALSE
Post Closure Units:	FALSE
Post Closure Ended:	FALSE
Clean Closed Units:	FALSE

Operator Info

Operator:	TRUE
Title:	
Owner:	FALSE
Contact Organization:	SILVERTON TRASH
Contact Address:	PO Box 600
Contact City:	Silverton
Contact State:	CO

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
Contact Zip:		81433-				
Contact Phone:		(970) 387-0155				
Operator:		FALSE				
Title:						
Owner:		TRUE				
Contact Organization:		TOWN OF SILVERTON				
Contact Address:		PO Box 600				
Contact City:		Silverton				
Contact State:		CO				
Contact Zip:		81433-				
Contact Phone:		(970) 387-5522				

<a href="#">136</a>	1 of 1	WNW	0.26 / 1,381.07	10,995.89 / -1,128	RED AND BONITA MINE COUNTY ROAD 52 SILVERTON CO 81433	CERCLIS
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Site ID:	0802811	RNPL Status Code:	N
Site EPA ID:	CON000802811	NPL Status:	Not on the NPL
Site Street Address 2:		RFED Facility Code:	N
Site County Name:	SAN JUAN	RFED Facility Desc:	Not a Federal Facility
Site FIPS Code:	08111	USGS Hydro Unit No.:	
Region Code:	08	Site Cong. Dist. Code:	
Site SMSA No.:		ROT Desc:	
Site Prim. Latitude:	+37.897230	FR NPL Update No.:	
Site Prim. Longitude:	-107.643672	RFRA Code:	
Lat Long Source:			
RNON NPL Status Desc:	Addressed as Part of Another non-NPL Site		

#### CERCLIS Site Contact Name(s)

Person ID:	8270347.00
First Name:	Sabrina
Last Name:	Forrest
Phone No.:	3033126484
Email:	

#### CERCLIS Site Contact Name(s)

Person ID:	13002356.00
First Name:	Steven
Last Name:	Merritt
Phone No.:	3033126146
Email:	merritt.steven@epa.gov

#### CERCLIS Assess History

OU ID:	00	RALT Short Name:	
Act Code ID:		Act Start Date:	
RAT Code:		Act Complete Date:	
RAT Short Name:		AGT Order No.:	0
RAT Name:		SH OU:	
RAT Hist. Only Flag:		SH Code:	
RAT NSI Indicator:		SH Seq:	
RAT Level:		SH Start Date:	
RAT DEF OU:		SH Complete Date:	
RFBS Code:		SH Lead:	
SPA Code:			
RAT Def:			
Site Desc:	The site is an abandoned mine with a waste rock dump and draining adit that is contributing significant heavy metals (Pb, Cd, Zn, and others) and acid drainage to the surrounding wetland and surface water (Cement Creek to upper Animas River). The adit is		
Site Alias:	No alias data available		

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
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#### CERCLIS Assess History

<b>OU ID:</b>	00	<b>RALT Short Name:</b>	EPA Fund
<b>Act Code ID:</b>	001	<b>Act Start Date:</b>	8/3/2010 00:00:00
<b>RAT Code:</b>	RS	<b>Act Complete Date:</b>	
<b>RAT Short Name:</b>	RV ASSESS	<b>AGT Order No.:</b>	30
<b>RAT Name:</b>	REMOVAL ASSESSMENT	<b>SH OU:</b>	
<b>RAT Hist. Only Flag:</b>		<b>SH Code:</b>	
<b>RAT NSI Indicator:</b>	B	<b>SH Seq:</b>	
<b>RAT Level:</b>	1	<b>SH Start Date:</b>	
<b>RAT DEF OU:</b>	00	<b>SH Complete Date:</b>	
<b>RFBS Code:</b>	V	<b>SH Lead:</b>	
<b>SPA Code:</b>	08		
<b>RAT Def:</b>	Collecting site characteristics to determine whether or not a removal must be performed.		
<b>Site Desc:</b>			
<b>Site Alias:</b>			

<a href="#">137</a>	1 of 1	NW	0.28 / 1,469.25	11,407.73 / -716	MOGUL/GRAND MOGUL MINE(S) CEMENT CREEK SILVERTON CO 81433	CERCLIS
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<b>Site ID:</b>	0802803	<b>RNPL Status Code:</b>	N
<b>Site EPA ID:</b>	CON000802803	<b>NPL Status:</b>	Not on the NPL
<b>Site Street Address 2:</b>	APPROX 11400 FT ELEVATION	<b>RFED Facility Code:</b>	N
<b>Site County Name:</b>	SAN JUAN	<b>RFED Facility Desc:</b>	Not a Federal Facility
<b>Site FIPS Code:</b>	08111	<b>USGS Hydro Unit No.:</b>	
<b>Region Code:</b>	08	<b>Site Cong. Dist. Code:</b>	
<b>Site SMSA No.:</b>		<b>ROT Desc:</b>	
<b>Site Prim. Latitude:</b>	+37.909739	<b>FR NPL Update No.:</b>	
<b>Site Prim. Longitude:</b>	-107.638610	<b>RFRA Code:</b>	
<b>Lat Long Source:</b>			
<b>RNON NPL Status Desc:</b>	Addressed as Part of Another non-NPL Site		

#### CERCLIS Site Contact Name(s)

<b>Person ID:</b>	8000116.00
<b>First Name:</b>	Steve
<b>Last Name:</b>	Way
<b>Phone No.:</b>	3033126723
<b>Email:</b>	way.steve@epa.gov

#### CERCLIS Site Contact Name(s)

<b>Person ID:</b>	8270347.00
<b>First Name:</b>	Sabrina
<b>Last Name:</b>	Forrest
<b>Phone No.:</b>	3033126484
<b>Email:</b>	

#### CERCLIS Assess History

<b>OU ID:</b>	00	<b>RALT Short Name:</b>	
<b>Act Code ID:</b>		<b>Act Start Date:</b>	
<b>RAT Code:</b>		<b>Act Complete Date:</b>	
<b>RAT Short Name:</b>		<b>AGT Order No.:</b>	0
<b>RAT Name:</b>		<b>SH OU:</b>	
<b>RAT Hist. Only Flag:</b>		<b>SH Code:</b>	
<b>RAT NSI Indicator:</b>		<b>SH Seq:</b>	
<b>RAT Level:</b>		<b>SH Start Date:</b>	
<b>RAT DEF OU:</b>		<b>SH Complete Date:</b>	
<b>RFBS Code:</b>		<b>SH Lead:</b>	
<b>SPA Code:</b>			
<b>RAT Def:</b>	Heavy metals and acid rock drainage from a historic, inactive hardrock mine. Hazardous substances being		
<b>Site Desc:</b>			

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
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Site Alias:

released include lead, copper, cadmium, and zinc at levels that constitute a major source of impact to the water quality and threat to aquatic life. P

No alias data available

CERCLIS Assess History

OU ID:

00

Act Code ID:

001

RAT Code:

RS

RAT Short Name:

RV ASSESS

RAT Name:

REMOVAL ASSESSMENT

RAT Hist. Only Flag:

RAT NSI Indicator:

B

RAT Level:

1

RAT DEF OU:

00

RFBS Code:

V

SPA Code:

08

RAT Def:

Site Desc:

Site Alias:

RALT Short Name:

EPA Fund

Act Start Date:

4/29/2010 00:00:00

Act Complete Date:

9/19/2012 00:00:00

AGT Order No.:

30

SH OU:

SH Code:

SH Seq:

SH Start Date:

SH Complete Date:

SH Lead:

Collecting site characteristics to determine whether or not a removal must be performed.

138

1 of 1

SSW

0.47 / 2,506.64

10,352.28 / -1,772

Lackawanna Mill Site  
468 County Road 20  
Silverton CO 81433

BROWNFIELDS

Proj Status(CDPHE):

Completed

Proj Status (Map):

Date of Completion:

1/2/2007

Content Type:

Application

Indoor Air:

Land Use - Zoning:

RECREATIONAL

Applicant:

Town of Silverton

Assessor Parcel No:

48290160010004

Media Soil:

Heavy Metals

Media Srfce Water:

Global ID:

Lat Long:

37.814080/-107.652224

Media Sediment:

Other Narrative Information:

Based on analytical results, there were detection in surface and subsurface soil of arsenic, barium, cadmium, copper, iron, lead, manganese, mercury, selenium, silver, and zinc above one or more of the CDPHE Soil Remediation Objectives (SRO's). While the \*\*Note: Many records provided by the department have a truncated [Other Narrative Information] field.

Former or Current Use of Site:

The mill was constructed in 1928-29 and a tram connected the mill to the mine in Swansea Gulch. For approxiamtely 20 years, the mill was used to process ore from the Lackawanna mine, just up the hill from the mill site. The Colorado Bureau of Mines' Ann

Planned Re Development Use:

The Lackawanna Mill Site is in public ownership, held by a municipality. The Town of Silverton plans to continue retaining ownership into the foreseeable future. It is the Town Board of Trustees who determines the final use and/or disposition of the Site \*\*Note: Many records provided by the department have a truncated [Planned Re Development Use] field.

Legal Desc:

Report Source:

Colorado Department of Public Health and Environment (CDPHE) Open Records Request

Public View:

TRUE

Housing Created:

0

County:

SAN JUAN

Acreage:

24.6

Lat:

Lon:

Application Type:

TBA

Dt of Received App:

8/1/2006

Media Ground Water:

Other Issue:

Other Issues Cmnts:

139

1 of 1

NW

0.51 / 2,670.63

11,602.11 / -522

UNKNOWN  
OURAY COUNTY  
OURAY CO 81427

MRDS

Dep ID:

10143374

Dev Status:

PAST PRODUCER

Code List:

AG PB

Url:

http://mrdata.usgs.gov/mrds/show-mrds.php?dep\_id=10143374

I1:

10

Latitude:

37.914307

Longitude:

-107.654175

Commodity

205

[erisinfo.com](http://erisinfo.com) | Environmental Risk Information Services

Order No: 22100605183

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	24 PB Lead Metallic Lead Tertiary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	1 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:30
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	24 AG Silver Metallic Silver Primary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	2 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:30
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	24 ZN Zinc Metallic Zinc Tertiary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	3 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:30
<b>Names</b>						
<b>I1:</b> <b>Status:</b> <b>Site Name:</b> <b>Line:</b>	24 Current Unknown 1				<b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	MAS migration 29-OCT-02 USGS 29-OCT-02

<a href="#">140</a>	1 of 1	WNW	0.54 / 2,859.93	11,595.74 / -528	IDARADO MINE TELLURIDE CO	SUPERFUND NRD
<b>Object ID:</b> <b>ID:</b> <b>Site Status:</b> <b>Pollutants:</b> <b>Webpost:</b> <b>EPA Links:</b> <b>CDPHE Link:</b>	10  NRD Zn, Pb Yes   <a href="https://www.colorado.gov/pacific/cdphe/idarado">https://www.colorado.gov/pacific/cdphe/idarado</a>				<b>Latitude:</b> <b>Longitude:</b> <b>Name:</b> <b>City:</b> <b>ZIP Code:</b>	37.9277395687869 -107.735077677003 IDARADO MINE TELLURIDE 

<a href="#">141</a>	1 of 1	NW	0.62 / 3,291.38	11,415.51 / -709	VERNON MINE OURAY COUNTY OURAY CO 81427	MRDS
<b>Dep ID:</b> <b>Dev Status:</b> <b>Code List:</b> <b>Url:</b>	10215673 PAST PRODUCER AU AG <a href="http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10215673">http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10215673</a>				<b>I1:</b> <b>Latitude:</b> <b>Longitude:</b>	15 37.917908 -107.655579

#### Commodity

<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	24 AU Gold Metallic Gold Primary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	1 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:57
<b>I1:</b> <b>Code:</b> <b>Commodity:</b> <b>Commodity Type:</b> <b>Commodity Group:</b> <b>Importance:</b>	32 AG Silver Metallic Silver Tertiary				<b>Line:</b> <b>Inserted By:</b> <b>Insert Date:</b> <b>Updated By:</b> <b>Update Date:</b>	2 MAS migration 29-OCT-2002 09:00:24 USGS 29-OCT-2002 09:01:57



Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
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Names

<b>I1:</b>	24	<b>Inserted By:</b>	MAS migration
<b>Status:</b>	Current	<b>Insert Date:</b>	29-OCT-02
<b>Site Name:</b>	Vernon Mine	<b>Updated By:</b>	USGS
<b>Line:</b>	1	<b>Update Date:</b>	29-OCT-02

<a href="#">142</a>	1 of 1	NW	0.79 / 4,170.73	11,103.15 / -1,021	UNKNOWN OURAY COUNTY OURAY CO 81427	MRDS
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<b>Dep ID:</b>	10287962	<b>I1:</b>	98
<b>Dev Status:</b>	PAST PRODUCER	<b>Latitude:</b>	37.921082
<b>Code List:</b>	AU PB	<b>Longitude:</b>	-107.656982
<b>Url:</b>	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10287962		

Commodity

<b>I1:</b>	76	<b>Line:</b>	1
<b>Code:</b>	AU	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Gold	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Gold	<b>Update Date:</b>	29-OCT-2002 09:02:29
<b>Importance:</b>	Primary		

<b>I1:</b>	76	<b>Line:</b>	2
<b>Code:</b>	PB	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Lead	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Lead	<b>Update Date:</b>	29-OCT-2002 09:02:29
<b>Importance:</b>	Tertiary		

<b>I1:</b>	76	<b>Line:</b>	3
<b>Code:</b>	AG	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Silver	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Silver	<b>Update Date:</b>	29-OCT-2002 09:02:29
<b>Importance:</b>	Tertiary		

Names

<b>I1:</b>	24	<b>Inserted By:</b>	MAS migration
<b>Status:</b>	Current	<b>Insert Date:</b>	29-OCT-02
<b>Site Name:</b>	Unknown	<b>Updated By:</b>	USGS
<b>Line:</b>	1	<b>Update Date:</b>	29-OCT-02

<a href="#">143</a>	1 of 1	NW	0.83 / 4,373.39	10,754.11 / -1,370	UNKNOWN OURAY COUNTY OURAY CO 81427	MRDS
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<b>Dep ID:</b>	10118530	<b>I1:</b>	28
<b>Dev Status:</b>	PAST PRODUCER	<b>Latitude:</b>	37.923096
<b>Code List:</b>	AG PB	<b>Longitude:</b>	-107.655884
<b>Url:</b>	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10118530		

Commodity

<b>I1:</b>	22	<b>Line:</b>	1
<b>Code:</b>	PB	<b>Inserted By:</b>	MAS migration
<b>Commodity:</b>	Lead	<b>Insert Date:</b>	29-OCT-2002 09:00:24
<b>Commodity Type:</b>	Metallic	<b>Updated By:</b>	USGS
<b>Commodity Group:</b>	Lead	<b>Update Date:</b>	29-OCT-2002 09:01:20

Map Key	Number of Records	Direction	Distance (mi/ft)	Elev/Diff (ft)	Site	DB
<b>Importance:</b>		Tertiary				
<b>I1:</b>	22			<b>Line:</b>	2	
<b>Code:</b>	AG			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Silver			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Silver			<b>Update Date:</b>	29-OCT-2002 09:01:20	
<b>Importance:</b>	Primary					
<b>I1:</b>	22			<b>Line:</b>	3	
<b>Code:</b>	ZN			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Zinc			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Zinc			<b>Update Date:</b>	29-OCT-2002 09:01:20	
<b>Importance:</b>	Tertiary					
<b><u>Names</u></b>						
<b>I1:</b>	24			<b>Inserted By:</b>	MAS migration	
<b>Status:</b>	Current			<b>Insert Date:</b>	29-OCT-02	
<b>Site Name:</b>	Unknown			<b>Updated By:</b>	USGS	
<b>Line:</b>	1			<b>Update Date:</b>	29-OCT-02	

<a href="#">144</a>	1 of 1	WNW	0.87 / 4,592.48	11,906.51 / -218	UNKNOWN OURAY COUNTY OURAY CO 81427	MRDS
<b>Dep ID:</b>	10143073			<b>I1:</b>	28	
<b>Dev Status:</b>	PAST PRODUCER			<b>Latitude:</b>	37.916687	
<b>Code List:</b>	AG PB			<b>Longitude:</b>	-107.660583	
<b>Url:</b>	http://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10143073					

<b><u>Commodity</u></b>						
<b>I1:</b>	23			<b>Line:</b>	2	
<b>Code:</b>	AG			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Silver			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Silver			<b>Update Date:</b>	29-OCT-2002 09:01:30	
<b>Importance:</b>	Primary					
<b>I1:</b>	19			<b>Line:</b>	3	
<b>Code:</b>	ZN			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Zinc			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Zinc			<b>Update Date:</b>	29-OCT-2002 09:01:30	
<b>Importance:</b>	Tertiary					
<b>I1:</b>	23			<b>Line:</b>	1	
<b>Code:</b>	PB			<b>Inserted By:</b>	MAS migration	
<b>Commodity:</b>	Lead			<b>Insert Date:</b>	29-OCT-2002 09:00:24	
<b>Commodity Type:</b>	Metallic			<b>Updated By:</b>	USGS	
<b>Commodity Group:</b>	Lead			<b>Update Date:</b>	29-OCT-2002 09:01:30	
<b>Importance:</b>	Tertiary					
<b><u>Names</u></b>						
<b>I1:</b>	24			<b>Inserted By:</b>	MAS migration	
<b>Status:</b>	Current			<b>Insert Date:</b>	29-OCT-02	
<b>Site Name:</b>	Unknown			<b>Updated By:</b>	USGS	
<b>Line:</b>	1			<b>Update Date:</b>	29-OCT-02	

## Unplottable Summary

Total: 0 Unplottable sites

DB	Company Name/Site Name	Address	City	Zip	ERIS ID
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No unplottable records were found that may be relevant for the search criteria.

# Unplottable Report

No unplottable records were found that may be relevant for the search criteria.

## Appendix: Database Descriptions

*Environmental Risk Information Services (ERIS) can search the following databases. The extent of historical information varies with each database and current information is determined by what is publicly available to ERIS at the time of update. ERIS updates databases as set out in ASTM Standard E1527-13 and E1527-21, Section 8.1.8 Sources of Standard Source Information:*

*"Government information from nongovernmental sources may be considered current if the source updates the information at least every 90 days, or, for information that is updated less frequently than quarterly by the government agency, within 90 days of the date the government agency makes the information available to the public."*

### Standard Environmental Record Sources

#### Federal

##### Formerly Utilized Sites Remedial Action Program:

DOE FUSRAP

The U.S. Department of Energy (DOE) established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from the Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations. The DOE Office of Legacy Management (LM) established long-term surveillance and maintenance (LTS&M) requirements for remediated FUSRAP sites. DOE evaluates the final site conditions of a remediated site on the basis of risk for different future uses. DOE then confirms that LTS&M requirements will maintain protectiveness.

**Government Publication Date: Mar 4, 2017**

##### National Priority List:

NPL

Sites on the United States Environmental Protection Agency (EPA)'s National Priorities List of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action under the Superfund program. The NPL, which EPA is required to update at least once a year, is based primarily on the score a site receives from EPA's Hazard Ranking System. A site must be on the NPL to receive money from the Superfund Trust Fund for remedial action. Sites are represented by boundaries where available in the EPA Superfund Site Boundaries maintained by the Shared Enterprise Geodata and Services (SEGS). Site boundaries represent the footprint of a whole site, the sum of all of the Operable Units and the current understanding of the full extent of contamination; for Federal Facility sites, the total site polygon may be the Facility boundary. Where there is no polygon boundary data available for a given site, the site is represented as a point.

**Government Publication Date: May 25, 2022**

##### National Priority List - Proposed:

PROPOSED NPL

Sites proposed - by the EPA, the state agency, or concerned citizens - for addition to the NPL due to contamination by hazardous waste and identified by the Environmental Protection Agency (EPA) as a candidate for cleanup because it poses a risk to human health and/or the environment. Sites are represented by boundaries where available in the EPA Superfund Site Boundaries maintained by the Shared Enterprise Geodata and Services (SEGS). Site boundaries represent the footprint of a whole site, the sum of all of the Operable Units and the current understanding of the full extent of contamination; for Federal Facility sites, the total site polygon may be the Facility boundary. Where there is no polygon boundary data available for a given site, the site is represented as a point.

**Government Publication Date: May 25, 2022**

##### Deleted NPL:

DELETED NPL

Sites deleted from the United States Environmental Protection Agency (EPA)'s National Priorities List. The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425(e), sites may be deleted from the NPL where no further response is appropriate. Sites are represented by boundaries where available in the EPA Superfund Site Boundaries maintained by the Shared Enterprise Geodata and Services (SEGS). Site boundaries represent the footprint of a whole site, the sum of all of the Operable Units and the current understanding of the full extent of contamination; for Federal Facility sites, the total site polygon may be the Facility boundary. Where there is no polygon boundary data available for a given site, the site is represented as a point.

**Government Publication Date: May 25, 2022**



**SEMS List 8R Active Site Inventory:**

SEMS

The Superfund Program has deployed the Superfund Enterprise Management System (SEMS), which integrates multiple legacy systems into a comprehensive tracking and reporting tool. This inventory contains active sites evaluated by the Superfund program that are either proposed to be or are on the National Priorities List (NPL) as well as sites that are in the screening and assessment phase for possible inclusion on the NPL. The Active Site Inventory Report displays site and location information at active SEMS sites. An active site is one at which site assessment, removal, remedial, enforcement, cost recovery, or oversight activities are being planned or conducted.

**Government Publication Date: Jun 30, 2022**

**Inventory of Open Dumps, June 1985:**

ODI

The Resource Conservation and Recovery Act (RCRA) provides for publication of an inventory of open dumps. The Act defines "open dumps" as facilities which do not comply with EPA's "Criteria for Classification of Solid Waste Disposal Facilities and Practices" (40 CFR 257).

**Government Publication Date: Jun 1985**

**SEMS List 8R Archive Sites:**

SEMS ARCHIVE

The Superfund Enterprise Management System (SEMS) Archived Site Inventory displays site and location information at sites archived from SEMS. An archived site is one at which EPA has determined that assessment has been completed and no further remedial action is planned under the Superfund program at this time.

**Government Publication Date: Jun 30, 2022**

**Comprehensive Environmental Response, Compensation and Liability Information System -**

CERCLIS

**CERCLIS:**

Superfund is a program administered by the United States Environmental Protection Agency (EPA) to locate, investigate, and clean up the worst hazardous waste sites throughout the United States. CERCLIS is a database of potential and confirmed hazardous waste sites at which the EPA Superfund program has some involvement. It contains sites that are either proposed to be or are on the National Priorities List (NPL) as well as sites that are in the screening and assessment phase for possible inclusion on the NPL. The EPA administers the Superfund program in cooperation with individual states and tribal governments; this database is made available by the EPA.

**Government Publication Date: Oct 25, 2013**

**EPA Report on the Status of Open Dumps on Indian Lands:**

IODI

Public Law 103-399, The Indian Lands Open Dump Cleanup Act of 1994, enacted October 22, 1994, identified congressional concerns that solid waste open dump sites located on American Indian or Alaska Native (AI/AN) lands threaten the health and safety of residents of those lands and contiguous areas. The purpose of the Act is to identify the location of open dumps on Indian lands, assess the relative health and environment hazards posed by those sites, and provide financial and technical assistance to Indian tribal governments to close such dumps in compliance with Federal standards and regulations or standards promulgated by Indian Tribal governments or Alaska Native entities.

**Government Publication Date: Dec 31, 1998**

**CERCLIS - No Further Remedial Action Planned:**

CERCLIS NFRAP

An archived site is one at which EPA has determined that assessment has been completed and no further remedial action is planned under the Superfund program at this time. The Archive designation means that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL). This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

**Government Publication Date: Oct 25, 2013**

**CERCLIS Liens:**

CERCLIS LIENS

A Federal Superfund lien exists at any property where EPA has incurred Superfund costs to address contamination ("Superfund site") and has provided notice of liability to the property owner. A Federal CERCLA ("Superfund") lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. This database is made available by the United States Environmental Protection Agency (EPA). This database was provided by the United States Environmental Protection Agency (EPA). Refer to SEMS LIEN as the current data source for Superfund Liens.

**Government Publication Date: Jan 30, 2014**

**RCRA CORRACTS-Corrective Action:**

RCRA CORRACTS

RCRA Info is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. At these sites, the Corrective Action Program ensures that cleanups occur. EPA and state regulators work with facilities and communities to design remedies based on the contamination, geology, and anticipated use unique to each site.

**Government Publication Date: Jun 27, 2022**

**RCRA non-CORRACTS TSD Facilities:**[RCRA TSD](#)

RCRA Info is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. This database includes Non-Corrective Action sites listed as treatment, storage and/or disposal facilities of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA).

**Government Publication Date: Jun 27, 2022**

**RCRA Generator List:**[RCRA LQG](#)

RCRA Info is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRA Info replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS). A hazardous waste generator is any person or site whose processes and actions create hazardous waste (see 40 CFR 260.10). Large Quantity Generators (LQGs) generate 1,000 kilograms per month or more of hazardous waste or more than one kilogram per month of acutely hazardous waste.

**Government Publication Date: Jun 27, 2022**

**RCRA Small Quantity Generators List:**[RCRA SQG](#)

RCRA Info is the EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRA Info replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS). A hazardous waste generator is any person or site whose processes and actions create hazardous waste (see 40 CFR 260.10). Small Quantity Generators (SQGs) generate more than 100 kilograms, but less than 1,000 kilograms, of hazardous waste per month.

**Government Publication Date: Jun 27, 2022**

**RCRA Very Small Quantity Generators List:**[RCRA VSQG](#)

RCRA Info is the EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. A hazardous waste generator is any person or site whose processes and actions create hazardous waste (see 40 CFR 260.10). Very Small Quantity Generators (VSQG) generate 100 kilograms or less per month of hazardous waste, or one kilogram or less per month of acutely hazardous waste. Additionally, VSQG may not accumulate more than 1,000 kilograms of hazardous waste at any time.

**Government Publication Date: Jun 27, 2022**

**RCRA Non-Generators:**[RCRA NON GEN](#)

RCRA Info is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRA Info replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS). A hazardous waste generator is any person or site whose processes and actions create hazardous waste (see 40 CFR 260.10). Non-Generators do not presently generate hazardous waste.

**Government Publication Date: Jun 27, 2022**

**RCRA Sites with Controls:**[RCRA CONTROLS](#)

List of Resource Conservation and Recovery Act (RCRA) facilities with institutional controls in place. RCRA gives the U.S. Environmental Protection Agency (EPA) the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances.

**Government Publication Date: Jun 27, 2022**

**Federal Engineering Controls-ECs:**[FED ENG](#)

Engineering controls (ECs) encompass a variety of engineered and constructed physical barriers (e.g., soil capping, sub-surface venting systems, mitigation barriers, fences) to contain and/or prevent exposure to contamination on a property. This database is made available by the United States Environmental Protection Agency (EPA).

**Government Publication Date: May 25, 2022**

**Federal Institutional Controls- ICs:**[FED INST](#)

Institutional controls are non-engineered instruments, such as administrative and legal controls, that help minimize the potential for human exposure to contamination and/or protect the integrity of the remedy. Although it is EPA's (United States Environmental Protection Agency) expectation that treatment or engineering controls will be used to address principal threat wastes and that groundwater will be returned to its beneficial use whenever practicable, ICs play an important role in site remedies because they reduce exposure to contamination by limiting land or resource use and guide human behavior at a site.

**Government Publication Date: May 25, 2022**

**Land Use Control Information System:**

LUCIS

The LUCIS database is maintained by the U.S. Department of the Navy and contains information for former Base Realignment and Closure (BRAC) properties across the United States.

**Government Publication Date:** Sep 1, 2006

**Institutional Control Boundaries at NPL sites:**

NPL IC

Boundaries of Institutional Control areas at sites on the United States Environmental Protection Agency (EPA)'s National Priorities List, or Proposed or Deleted, made available by the EPA's Shared Enterprise Geodata and Services (SEGS). United States Environmental Protection Agency (EPA)'s National Priorities List of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action under the Superfund program. Institutional controls are non-engineered instruments such as administrative and legal controls that help minimize the potential for human exposure to contamination and/or protect the integrity of the remedy.

**Government Publication Date:** May 25, 2022

**Emergency Response Notification System:**

ERNS 1982 TO 1986

Database of oil and hazardous substances spill reports controlled by the National Response Center. The primary function of the National Response Center is to serve as the sole national point of contact for reporting oil, chemical, radiological, biological, and etiological discharges into the environment anywhere in the United States and its territories.

**Government Publication Date:** 1982-1986

**Emergency Response Notification System:**

ERNS 1987 TO 1989

Database of oil and hazardous substances spill reports controlled by the National Response Center. The primary function of the National Response Center is to serve as the sole national point of contact for reporting oil, chemical, radiological, biological, and etiological discharges into the environment anywhere in the United States and its territories.

**Government Publication Date:** 1987-1989

**Emergency Response Notification System:**

ERNS

Database of oil and hazardous substances spill reports made available by the United States Coast Guard National Response Center (NRC). The NRC fields initial reports for pollution and railroad incidents and forwards that information to appropriate federal/state agencies for response. These data contain initial incident data that has not been validated or investigated by a federal/state response agency.

**Government Publication Date:** Jun 5, 2022

**The Assessment, Cleanup and Redevelopment Exchange System (ACRES) Brownfield Database:**

FED BROWNFIELDS

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties protects the environment, reduces blight, and takes development pressures off greenspaces and working lands. This database is made available by the United States Environmental Protection Agency (EPA).

**Government Publication Date:** Aug 20, 2021

**FEMA Underground Storage Tank Listing:**

FEMA UST

The Federal Emergency Management Agency (FEMA) of the Department of Homeland Security maintains a list of FEMA owned underground storage tanks.

**Government Publication Date:** Dec 31, 2017

**Facility Response Plan:**

FRP

List of facilities that have submitted Facility Response Plans (FRP) to EPA. Facilities that could reasonably be expected to cause "substantial harm" to the environment by discharging oil into or on navigable waters are required to prepare and submit Facility Response Plans (FRPs). Harm is determined based on total oil storage capacity, secondary containment and age of tanks, oil transfer activities, history of discharges, proximity to a public drinking water intake or sensitive environments.

**Government Publication Date:** Dec 31, 2021

**Delisted Facility Response Plans:**

DELISTED FRP

Facilities that once appeared in - and have since been removed from - the list of facilities that have submitted Facility Response Plans (FRP) to EPA. Facilities that could reasonably be expected to cause "substantial harm" to the environment by discharging oil into or on navigable waters are required to prepare and submit Facility Response Plans (FRPs). Harm is determined based on total oil storage capacity, secondary containment and age of tanks, oil transfer activities, history of discharges, proximity to a public drinking water intake or sensitive environments.

**Government Publication Date:** Dec 31, 2021

**Historical Gas Stations:**[HIST GAS STATIONS](#)

This historic directory of service stations is provided by the Cities Service Company. The directory includes Cities Service filling stations that were located throughout the United States in 1930.

**Government Publication Date:** Jul 1, 1930

**Petroleum Refineries:**[REFN](#)

List of petroleum refineries from the U.S. Energy Information Administration (EIA) Refinery Capacity Report. Includes operating and idle petroleum refineries (including new refineries under construction) and refineries shut down during the previous year located in the 50 States, the District of Columbia, Puerto Rico, the Virgin Islands, Guam, and other U.S. possessions. Survey locations adjusted using public data.

**Government Publication Date:** Feb 4, 2022

**Petroleum Product and Crude Oil Rail Terminals:**[BULK TERMINAL](#)

List of petroleum product and crude oil rail terminals made available by the U.S. Energy Information Administration (EIA). Includes operable bulk petroleum product terminals located in the 50 States and the District of Columbia with a total bulk shell storage capacity of 50,000 barrels or more, and/or the ability to receive volumes from tanker, barge, or pipeline; also rail terminals handling the loading and unloading of crude oil that were active between 2017 and 2018. Petroleum product terminals comes from the EIA-815 Bulk Terminal and Blender Report, which includes working, shell in operation, and shell idle for several major product groupings. Survey locations adjusted using public data.

**Government Publication Date:** Feb 4, 2022

**LIEN on Property:**[SEMS LIEN](#)

The EPA Superfund Enterprise Management System (SEMS) provides LIEN information on properties under the EPA Superfund Program.

**Government Publication Date:** Jun 30, 2022

**Superfund Decision Documents:**[SUPERFUND ROD](#)

This database contains a listing of decision documents for Superfund sites. Decision documents serve to provide the reasoning for the choice of (or) changes to a Superfund Site cleanup plan. The decision documents include Records of Decision (ROD), ROD Amendments, Explanations of Significant Differences (ESD), along with other associated memos and files. This information is maintained and made available by the US EPA (Environmental Protection Agency).

**Government Publication Date:** Jul 26, 2022

**State****Environmental Covenants and Use Restrictions:**[COVENANTS](#)

Boundaries of environmental covenant/environmental use restriction sites made available by the Colorado Department of Public Health & Environment (CDPHE). CDPHE has the authority to approve requests to restrict the future use of a property using an enforceable agreement called an environmental covenant. Land use restrictions may be used to ensure the cleanup remedy adequately protects human health and the environment when a contaminated site isn't cleaned up completely.

**Government Publication Date:** Feb 10, 2022

**Superfund National Priorities List and Natural Resource Damages sites:**[SUPERFUND NRD](#)

Boundaries of Superfund National Priorities List sites and Natural Resource Damages sites in Colorado made available by the Colorado Department of Public Health and Environment (CDPHE).

**Government Publication Date:** Jun 16, 2021

**Methane Gas Study Sites:**[LANDFILL METHANE](#)

This Investigation of Methane Gas Hazards report was prepared by the Denver Office of Emergency Preparedness in 1981. The purpose of this study was to assess the actual and potential generation, migration, explosive and related problems associated with specified landfills, and to identify existing and potential problems, suggested strategies to prevent, abate, and control such problems and recommend investigative and monitoring functions as may be deemed necessary. The Colorado Department of Health selected eight landfills as priorities due to population density and potential hazards to population and property.

**Government Publication Date:** Jan 2, 1981

**Superfund Sites:**[SHWS](#)

A list of Superfund sites in Colorado made available by the Colorado Department of Public Health and Environment (CDPHE). In Colorado, the cleanup of Superfund sites is overseen by the CDPHE or the Environmental Protection Agency (EPA). This list includes active Superfund sites, deleted sites, proposed sites, and natural resource damage sites.

**Government Publication Date:** Jun 29, 2022

**Delisted Superfund Sites:**[DELISTED SHWS](#)

Sites which once appeared on - but have since been removed from - the list of Superfund sites in Colorado made available by the Colorado Department of Public Health and Environment (CDPHE). In Colorado, the cleanup of Superfund sites is overseen by the CDPHE or the Environmental Protection Agency (EPA).

**Government Publication Date: Jun 29, 2022**

**Solid Waste Facilities and Landfills:**[SWF/LF](#)

The Colorado Department of Public Health and Environment (CDPHE) regulates the management and disposal of solid waste and landfill facilities. This data is provided by the CDPHE's Hazardous Materials and Waste Management Division's Solid Waste Report and the Environmental Sites Search Map Application.

**Government Publication Date: May 3, 2022**

**Historical Solid Waste (Closed or Abandoned Landfills):**[HIST LF](#)

In the early 1980s the Hazardous Materials Waste Management Division of the Colorado Department of Public Health and Environment (CDPHE) conducted a survey of staff members and local agencies. The information gathered was compiled in 1984 for sites that were known or thought to have waste issues. The information is not complete and generally not very definitive or verifiable. This data became the Solid Waste Historical Data. The data is not maintained and has not been since the late 1980s.

**Government Publication Date: 1984**

**Tri-County Historic Landfills:**[HIST LANDFILLS](#)

A list of historical landfills made available by the Tri-County Health Department (TCHD). The TCHD serves Adams, Arapahoe, and Douglas Counties.

**Government Publication Date: Jun 1, 2022**

**Registered Recycling Facilities:**[RECYCLING](#)

This list of registered recycling facilities in Colorado is maintained by the Colorado Department of Public Health & Environment (CDPHE). This list includes primarily processing facilities for recyclable materials, such as material recovery facilities, industrial recycling operations, and recyclable material end user sites. Collection centers/drop-off locations are not included unless the site is also processing recyclable materials (separating, sorting, dismantling, grinding, baling, etc.).

**Government Publication Date: Sep 12, 2022**

**Leaking Storage Tanks:**[LST](#)

A list of leaking storage tank locations from the Colorado Storage Tank Information System (COSTIS) database, including those which have applied for reimbursement from the Petroleum Storage Tank Fund. This list has been made available by the Colorado Department of Labor and Employment (CDLE).

**Government Publication Date: Jul 19, 2022**

**LUST Trust Sites:**[LUST TRUST](#)

The Division of Oil and Public Safety of the Colorado Department of Labor and Employment (CDLE) manages a Petroleum Storage Tank Fund (The Fund) that receives and processes applications to the Fund for reimbursement of costs related to assessment and cleanup of petroleum contaminated sites.

**Government Publication Date: Jul 19, 2022**

**Delisted Leaking Storage Tanks:**[DELISTED LST](#)

This database contains a list of leaking storage tank sites and their Funds for reimbursement of costs related to assessment and cleanup that were removed from the Colorado Department of Labor and Employment (CDLE) database.

**Government Publication Date: Jul 19, 2022**

**Underground Storage Tanks:**[UST](#)

A list of underground storage tanks from the Colorado Storage Tank Information System (COSTIS) database. This database is made available by the Division of Oil and Public Safety of the Colorado Department of Labor and Employment (CDLE).

**Government Publication Date: Jul 19, 2022**

**Aboveground Storage Tanks:**[AST](#)

A list of aboveground storage tanks from the Colorado Storage Tank Information System (COSTIS) database. This list is made available by the Division of Oil and Public Safety of the Colorado Department of Labor and Employment (CDLE).

**Government Publication Date: Jul 19, 2022**



**Storage Tank Information System (COSTIS):**[TANKS](#)

This storage tank listing is provided by the Colorado Department of Labor and Employment, Division of Oil and Public Safety (OPS). The OPS manages the Colorado Storage Tank Information System (COSTIS) database which stores information on these facilities. This tank data includes facilities with liquefied petroleum gas, liquefied natural gas, and compressed natural gas tanks which are not classified as either underground storage tanks or aboveground storage tanks. Data is compiled from applicable FOIA files, COSTIS files and other OPS datasets.

**Government Publication Date:** Jul 19, 2022

**Delisted Storage Tanks:**[DTNK](#)

This database contains a list of closed storage tank sites that were removed from the Division of Oil and Public Safety of the Colorado Department of Labor and Employment (CDLE) Tank Information System.

**Government Publication Date:** Jul 19, 2022

**Environmental Covenants and Environmental Use Restrictions List:**[AUL](#)

The Colorado Department of Public Health and Environment (CDPHE) maintains a list of sites that have environmental covenants and use restrictions in place. Land use restrictions may be used to ensure the cleanup remedy adequately protects human health and the environment when a contaminated site is not cleaned up completely.

**Government Publication Date:** Apr 11, 2022

**The Voluntary Cleanup and Redevelopment Program:**[VCP](#)

The Voluntary Cleanup and Redevelopment program of the Colorado Department of Public Health and Environment (CDPHE) was created in 1994 with the objective to facilitate the redevelopment and transfer of contaminated properties.

**Government Publication Date:** Jul 1, 2022

**Brownfield Sites:**[BROWNFIELDS](#)

Brownfields Program sites found in the Colorado Environmental Records Search Interactive Map made available by the Colorado Department of Public Health and Environment (CDPHE). Sites which go untouched because of their real or perceived contamination can be rehabilitated using the CDPHE Brownfields Program.

**Government Publication Date:** Aug 1, 2022

**Tribal****Leaking Underground Storage Tanks (LUSTs) on Indian Lands:**[INDIAN LUST](#)

This list of leaking underground storage tanks (LUSTs) on Tribal/Indian Lands in Region 8, which includes Colorado, is made available by the United States Environmental Protection Agency (EPA).

**Government Publication Date:** Apr 20, 2022

**Underground Storage Tanks (USTs) on Indian Lands:**[INDIAN UST](#)

This list of underground storage tanks (USTs) on Tribal/Indian Lands in Region 8, which includes Colorado, is made available by the United States Environmental Protection Agency (EPA).

**Government Publication Date:** Apr 20, 2022

**Delisted Tribal Leaking Storage Tanks:**[DELISTED ILST](#)

Leaking Underground Storage Tank facilities which have been removed from the Regional Tribal LUST lists made available by the EPA.

**Government Publication Date:** Apr 9, 2022

**Delisted Tribal Underground Storage Tanks:**[DELISTED IUST](#)

Underground Storage Tank facilities which have been removed from the Regional Tribal UST lists made available by the EPA.

**Government Publication Date:** Apr 20, 2022

**County**

**No County databases were selected to be included in the search.**

**Additional Environmental Record Sources**

## **Federal**

### **Facility Registry Service/Facility Index:**

FINDS/FRS

The Facility Registry Service (FRS) is a centrally managed database that identifies facilities, sites, or places subject to environmental regulations or of environmental interest. FRS creates high-quality, accurate, and authoritative facility identification records through rigorous verification and management procedures that incorporate information from program national systems, state master facility records, and data collected from EPA's Central Data Exchange registrations and data management personnel. This list is made available by the Environmental Protection Agency (US EPA).

**Government Publication Date: Nov 2, 2020**

### **Toxics Release Inventory (TRI) Program:**

TRIS

The EPA's Toxics Release Inventory (TRI) is a database containing data on disposal or other releases of over 650 toxic chemicals from thousands of U.S. facilities and information about how facilities manage those chemicals through recycling, energy recovery, and treatment. One of TRI's primary purposes is to inform communities about toxic chemical releases to the environment.

**Government Publication Date: Aug 24, 2021**

### **Perfluorinated Alkyl Substances (PFAS) Releases:**

PFAS TRI

List of Toxics Release Inventory (TRI) facilities at which the reported chemical is a Per- or polyfluorinated alkyl substance (PFAS) included in the Environmental Protection Agency (EPA)'s consolidated PFAS Master List of PFAS Substances. The EPA's Toxics Release Inventory (TRI) is a database containing data on disposal or other releases of over 650 toxic chemicals from thousands of U.S. facilities and information about how facilities manage those chemicals through recycling, energy recovery, and treatment.

**Government Publication Date: Aug 24, 2021**

### **PFOA/PFOS Contaminated Sites:**

PFAS NPL

List of National Priorities List (NPL) and related Superfund Alternative Agreement (SAA) sites where PFOA or PFOS contaminants have been found in water and/or soil. The site listing is provided by the Federal Environmental Protection Agency (EPA).

**Government Publication Date: Jul 18, 2022**

### **Perfluorinated Alkyl Substances (PFAS) Water Quality:**

PFAS WATER

The Water Quality Portal (WQP) is a cooperative service sponsored by the United States Geological Survey (USGS), the Environmental Protection Agency (EPA), and the National Water Quality Monitoring Council (NWQMC). This listing includes records from the Water Quality Portal where the characteristic (environmental measurement) is in the Environmental Protection Agency (EPA)'s consolidated PFAS Master List of PFAS Substances.

**Government Publication Date: Jul 20, 2020**

### **SSEHRI PFAS Contamination Sites:**

PFAS SSEHRI

This PFAS Contamination Site Tracker database is compiled by the Social Science Environmental Health Research Institute (SSEHRI) at Northeastern University. According to the SSEHRI, the database records qualitative and quantitative data from each known site of PFAS contamination, including timeline of discovery, sources, levels, health impacts, community response, and government response. The goal of this database is to compile information and support public understanding of the rapidly unfolding issue of PFAS contamination. All data presented was extracted from government websites, news articles, or publicly available documents, and this is cited in the tracker. Disclaimer: The source conveys this database undergoes regular updates as new information becomes available, some sites may be missing and/or contain information that is incorrect or outdated, as well as their information represents all contamination sites SSEHRI is aware of, not all possible contamination sites. This data is not intended to be used for legal purposes. Limited location details are available with this data. Access the following for the most current informations <https://pfasproject.com/pfas-contamination-site-tracker/>

**Government Publication Date: Dec 12, 2019**

### **National Response Center PFAS Spills:**

ERNS PFAS

National Response Center (NRC) calls from 1990 to the most recent complete calendar year where there is indication of Aqueous Film Forming Foam (AFFF) usage. NRC calls may reference AFFF usage in the "Material Involved" or "Incident Description" fields. Data made available by the US Environmental Protection Agency (EPA). Disclaimer: dataset may include initial or misidentified incident data not yet validated or investigated by a federal/state response agency.

**Government Publication Date: Feb 23, 2022**

### **Hazardous Materials Information Reporting System:**

HMIRS

US DOT - Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) Incidents Reports Database taken from Hazmat Intelligence Portal, U.S. Department of Transportation.

**Government Publication Date: Sep 1, 2020**

**National Clandestine Drug Labs:**

NCDL

The U.S. Department of Justice ("the Department") provides this data as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy.

**Government Publication Date:** Apr 30, 2022

**Toxic Substances Control Act:**

TSCA

The Environmental Protection Agency (EPA) is amending the Toxic Substances Control Act (TSCA) section 8(a) Inventory Update Reporting (IUR) rule and changing its name to the Chemical Data Reporting (CDR) rule.

The CDR enables EPA to collect and publish information on the manufacturing, processing, and use of commercial chemical substances and mixtures (referred to hereafter as chemical substances) on the TSCA Chemical Substance Inventory (TSCA Inventory). This includes current information on chemical substance production volumes, manufacturing sites, and how the chemical substances are used. This information helps the Agency determine whether people or the environment are potentially exposed to reported chemical substances. EPA publishes submitted CDR data that is not Confidential Business Information (CBI).

**Government Publication Date:** Apr 11, 2019

**Hist TSCA:**

HIST TSCA

The Environmental Protection Agency (EPA) is amending the Toxic Substances Control Act (TSCA) section 8(a) Inventory Update Reporting (IUR) rule and changing its name to the Chemical Data Reporting (CDR) rule.

The 2006 IUR data summary report includes information about chemicals manufactured or imported in quantities of 25,000 pounds or more at a single site during calendar year 2005. In addition to the basic manufacturing information collected in previous reporting cycles, the 2006 cycle is the first time EPA collected information to characterize exposure during manufacturing, processing and use of organic chemicals. The 2006 cycle also is the first time manufacturers of inorganic chemicals were required to report basic manufacturing information.

**Government Publication Date:** Dec 31, 2006

**FTTS Administrative Case Listing:**

FTTS ADMIN

An administrative case listing from the Federal Insecticide, Fungicide, & Rodenticide Act (FIFRA) and Toxic Substances Control Act (TSCA), together known as FTTS. This database was obtained from the Environmental Protection Agency's (EPA) National Compliance Database (NCDB). The FTTS and NCDB was shut down in 2006.

**Government Publication Date:** Jan 19, 2007

**FTTS Inspection Case Listing:**

FTTS INSP

An inspection case listing from the Federal Insecticide, Fungicide, & Rodenticide Act (FIFRA) and Toxic Substances Control Act (TSCA), together known as FTTS. This database was obtained from the Environmental Protection Agency's (EPA) National Compliance Database (NCDB). The FTTS and NCDB was shut down in 2006.

**Government Publication Date:** Jan 19, 2007

**Potentially Responsible Parties List:**

PRP

Early in the cleanup process, the Environmental Protection Agency (EPA) conducts a search to find the potentially responsible parties (PRPs). EPA looks for evidence to determine liability by matching wastes found at the site with parties that may have contributed wastes to the site.

**Government Publication Date:** Jul 26, 2022

**State Coalition for Remediation of Drycleaners Listing:**

SCRD DRYCLEANER

The State Coalition for Remediation of Drycleaners (SCRD) was established in 1998, with support from the U.S. Environmental Protection Agency (EPA) Office of Superfund Remediation and Technology Innovation. Coalition members are states with mandated programs and funding for drycleaner site remediation. Current members are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin. Since 2017, the SCRd no longer maintains this data, refer to applicable state source data where available.

**Government Publication Date:** Nov 08, 2017

**Integrated Compliance Information System (ICIS):**

ICIS

The Integrated Compliance Information System (ICIS) is a system that provides information for the Federal Enforcement and Compliance (FE&C) and the National Pollutant Discharge Elimination System (NPDES) programs. The FE&C component supports the Environmental Protection Agency's (EPA) Civil Enforcement and Compliance program activities. These activities include Compliance Assistance, Compliance Monitoring and Enforcement. The NPDES program supports tracking of NPDES permits, limits, discharge monitoring data and other program reports.

**Government Publication Date:** Apr 30, 2022

**Drycleaner Facilities:**

FED DRYCLEANERS

A list of drycleaner facilities from Enforcement and Compliance History Online (ECHO) online search. The Environmental Protection Agency (EPA) tracks facilities that possess NAIC and SIC codes that classify businesses as drycleaner establishments.

**Delisted Drycleaner Facilities:**

[DELISTED FED DRY](#)

List of sites removed from the list of Drycleaner Facilities (sites in the EPA's Integrated Compliance Information System (ICIS) with NAIC or SIC codes identifying the business as a drycleaner establishment).

Government Publication Date: Jun 25, 2022

**Formerly Used Defense Sites:**

[FUDS](#)

Formerly Used Defense Sites (FUDS) are properties that were formerly owned by, leased to, or otherwise possessed by and under the jurisdiction of the Secretary of Defense prior to October 1986, where the Department of Defense (DoD) is responsible for an environmental restoration. This list is published by the U.S. Army Corps of Engineers.

Government Publication Date: May 26, 2021

**Former Military Nike Missile Sites:**

[FORMER NIKE](#)

This information was taken from report DRXTH-AS-IA-83A016 (Historical Overview of the Nike Missile System, 12/1984) which was performed by Environmental Science and Engineering, Inc. for the U.S. Army Toxic and Hazardous Materials Agency Assessment Division. The Nike system was deployed between 1954 and the mid-1970's. Among the substances used or stored on Nike sites were liquid missile fuel (JP-4); starter fluids (UDKH, aniline, and furfuryl alcohol); oxidizer (IRFNA); hydrocarbons (motor oil, hydraulic fluid, diesel fuel, gasoline, heating oil); solvents (carbon tetrachloride, trichloroethylene, trichloroethane, stoddard solvent); and battery electrolyte. The quantities of material a disposed of and procedures for disposal are not documented in published reports. Virtually all information concerning the potential for contamination at Nike sites is confined to personnel who were assigned to Nike sites. During deactivation most hardware was shipped to depot-level supply points. There were reportedly instances where excess materials were disposed of on or near the site itself at closure. There was reportedly no routine site decontamination.

Government Publication Date: Dec 2, 1984

**PHMSA Pipeline Safety Flagged Incidents:**

[PIPELINE INCIDENT](#)

A list of flagged pipeline incidents made available by the U.S. Department of Transportation (US DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA). PHMSA regulations require incident and accident reports for five different pipeline system types.

Government Publication Date: Jul 7, 2020

**Material Licensing Tracking System (MLTS):**

[MLTS](#)

A list of sites that store radioactive material subject to the Nuclear Regulatory Commission (NRC) licensing requirements. This list is maintained by the NRC. As of September 2016, the NRC no longer releases location information for sites. Site locations were last received in July 2016.

Government Publication Date: May 11, 2021

**Historic Material Licensing Tracking System (MLTS) sites:**

[HIST MLTS](#)

A historic list of sites that have inactive licenses and/or removed from the Material Licensing Tracking System (MLTS). In some cases, a site is removed from the MLTS when the state becomes an "Agreement State". An Agreement State is a State that has signed an agreement with the Nuclear Regulatory Commission (NRC) authorizing the State to regulate certain uses of radioactive materials within the State.

Government Publication Date: Jan 31, 2010

**Mines Master Index File:**

[MINES](#)

The Master Index File (MIF) is provided by the United State Department of Labor, Mine Safety and Health Administration (MSHA). This file, which was originally created in the 1970's, contained many Mine-IDs that were invalid. MSHA removes invalid IDs from the MIF upon discovery. MSHA applicable data includes the following: all Coal and Metal/Non-Metal mines under MSHA's jurisdiction since 1/1/1970; mine addresses for all mines in the database except for Abandoned mines prior to 1998 from MSHA's legacy system (addresses may or may not correspond with the physical location of the mine itself); violations that have been assessed penalties as a result of MSHA inspections beginning on 1/1/2000; and violations issued as a result of MSHA inspections conducted beginning on 1/1/2000.

Government Publication Date: Aug 3, 2022

**Surface Mining Control and Reclamation Act Sites:**

[SMCRA](#)

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by the Office of Surface Mining Reclamation and Enforcement (OSMRE) to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of Abandoned Mine Land (AML) impacts, as well as information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Government Publication Date: Aug 18, 2022

**Mineral Resource Data System:**

[MRDS](#)

The Mineral Resource Data System (MRDS) is a collection of reports describing metallic and nonmetallic mineral resources throughout the world. Included are deposit name, location, commodity, deposit description, geologic characteristics, production, reserves, resources, and references. This database contains the records previously provided in the Mineral Resource Data System (MRDS) of USGS and the Mineral Availability System/Mineral Industry Locator System (MAS/MILS) originated in the U.S. Bureau of Mines, which is now part of USGS. The USGS has ceased systematic updates of the MRDS database with their focus more recently on deposits of critical minerals while providing a well-documented baseline of historical mine locations from USGS topographic maps.

**Government Publication Date: Mar 15, 2016**

#### **Uranium Mill Tailings Radiation Control Act Sites:**

**URANIUM**

The Legacy Management Office of the Department of Energy (DOE) manages radioactive and chemical waste, environmental contamination, and hazardous material at over 100 sites across the U.S. The L.M. Office manages this database of sites registered under the Uranium Mill Tailings Control Act (UMTRCA).

**Government Publication Date: Mar 4, 2017**

#### **Alternative Fueling Stations:**

**ALT FUELS**

List of alternative fueling stations made available by the US Department of Energy's Office of Energy Efficiency & Renewable Energy. Includes Biodiesel stations, Ethanol (E85) stations, Liquefied Petroleum Gas (Propane) stations, Ethanol (E85) stations, Natural Gas stations, Hydrogen stations, and Electric Vehicle Supply Equipment (EVSE). The National Renewable Energy Laboratory (NREL) obtains information about new stations from trade media, Clean Cities coordinators, a Submit New Station form on the Station Locator website, and through collaborating with infrastructure equipment and fuel providers, original equipment manufacturers (OEMs), and industry groups.

**Government Publication Date: Aug 1, 2022**

#### **Air Facility System:**

**AFS**

This EPA retired Air Facility System (AFS) dataset contains emissions, compliance, and enforcement data on stationary sources of air pollution. Regulated sources cover a wide spectrum; from large industrial facilities to relatively small operations such as dry cleaners. AFS does not contain data on facilities that are solely asbestos demolition and/or renovation contractors, or landfills. ECHO Clean Air Act data from AFS are frozen and reflect data as of October 17, 2014; the EPA retired this system for Clean Air Act stationary sources and transitioned to ICIS-Air.

**Government Publication Date: Oct 17, 2014**

#### **Superfunds Consent Decrees:**

**CONSENT DECREES**

A list of Superfund consent decrees made available by the Department of Justice, Environment & Natural Resources Division (ENRD).

**Government Publication Date: May 18, 2022**

#### **Registered Pesticide Establishments:**

**SSTS**

List of active EPA-registered foreign and domestic pesticide-producing and device-producing establishments based on data from the Section Seven Tracking System (SSTS). The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Section 7 requires that facilities producing pesticides, active ingredients, or devices be registered. The list of establishments is made available by the EPA.

**Government Publication Date: Mar 30, 2022**

#### **Polychlorinated Biphenyl (PCB) Transformers:**

**PCBT**

Locations of Transformers Containing Polychlorinated Biphenyls (PCBs) registered with the United States Environmental Protection Agency. PCB transformer owners must register their transformer(s) with EPA. Although not required, PCB transformer owners who have removed and properly disposed of a registered PCB transformer may notify EPA to have their PCB transformer de-registered. Data made available by EPA.

**Government Publication Date: Oct 15, 2019**

#### **Polychlorinated Biphenyl (PCB) Notifiers:**

**PCB**

Facilities included in the national list of facilities that have notified the United States Environmental Protection Agency (EPA) of Polychlorinated Biphenyl (PCB) activities. Any company or person storing, transporting or disposing of PCBs or conducting PCB research and development must notify the EPA and receive an identification number.

**Government Publication Date: Jul 28, 2022**

#### **State**

##### **Spills:**

**SPILLS**

A list of hazardous material spills and releases (including Meth Labs) that were reported to the Colorado Department of Public Health and Environment (CDPHE).

**Government Publication Date: Apr 8, 2022**



**Colorado Oil and Gas Conservation Commission Spills:**

OG SPILLS

A list of spills made available by the Colorado Oil and Gas Conservation Commission (COGCC).

**Government Publication Date:** Jun 22, 2022

**Dry Cleaning Facilities:**

DRYCLEANERS

A list of dry cleaners provided by the Colorado Department of Public Health and Environment (CDPHE) Hazardous Waste Compliance Assurance Unit and Stationary Sources Program.

**Government Publication Date:** Sep 19, 2022

**Delisted Dry Cleaning Facilities:**

DELISTED DRYCLEANERS

List of sites removed from the drycleaners database made available by the Department of Public Health & Environment.

**Government Publication Date:** Sep 19, 2022

**Air Pollution Control Division Permitted Facilities:**

AIR PERMITS

This list of Air Pollution Control Division Permitted Facilities is maintained by the Colorado Department of Public Health and Environment. The Stationary Sources Program evaluates and develops air permits for stationary sources in Colorado. The program inspects sources to determine compliance with air regulations and permit conditions and maintains an inventory of air pollution emissions throughout the state.

**Government Publication Date:** Jul 12, 2022

**Per- and Polyfluoroalkyl Substances (PFAS):**

PFAS

A list of facilities that reported storing or using AFFF or Class B firefighting foam, other PFAS chemicals, have reported PFAS passthrough, or have detectable limits of PFAS in their discharge.

**Government Publication Date:** Dec 8, 2020

**Asbestos Abatement and Demolition Projects:**

ASBESTOS

A list of Asbestos Abatement and Demolition Projects made available by the Colorado Department of Public Health and Environment (CDPHE), Air Pollution Control Division.

**Government Publication Date:** Dec 28, 2017

**Hazardous Waste Sites- Generator:**

HAZ GEN

A list of hazardous waste generators. This list is made available by the Colorado Department of Public Health and Environment (CDPHE).

**Government Publication Date:** Jun 30, 2003

**Permitted Facilities Listing:**

NPDES

A list of permitted facilities tracked by the Water Quality Control Division of the Department of Public Health & Environment (DPHE). This list is the state version of the NPDES (National Pollution Discharge Elimination System).

**Government Publication Date:** Mar 1, 2022

**Hazardous Waste Sites- Treatment, Storage & Disposal:**

HAZ TSD

A list of facilities that treat, store, dispose, or recycle hazardous waste on-site. This list is made available by the Colorado Department of Public Health and Environment (CDPHE).

**Government Publication Date:** Jun 30, 2003

**Hazardous Waste Sites- Corrective Action:**

HAZ CORRACT

A list of hazardous waste generators with corrective actions. This list is made available by the Colorado Department of Public Health and Environment (CDPHE).

**Government Publication Date:** Jun 30, 2003

**Uranium Mill Tailings Sites:**

UMTRA

There were nine uranium mill tailings sites in Colorado designated for cleanup under the Federal Uranium Mill Tailings Radiation Control Act (UMTRA). These nine sites, known commonly as UMTRA sites, were remediated jointly by the State of Colorado and the U.S. Department of Energy during the late 1980's and early 1990's. Mill tailings were removed from 8 of the mill sites and relocated in engineered disposal cells. A disposal cell is designed to encapsulate the material, reduce radon emanation, and prevent the movement of water through the material. At one site, Maybell, CO, the tailings were stabilized in-place at the mill site. After remediation of the tailings was completed, the State and DOE began to investigate the residual impacts to groundwater at the mill sites. The groundwater phase of the UMTRA program is on-going. This database was provided by the Colorado Department of Public Health and Environment in 2008.

**Tribal**

*No Tribal additional environmental record sources available for this State.*

**County**

*No County additional environmental databases were selected to be included in the search.*

# Definitions

**Database Descriptions:** This section provides a detailed explanation for each database including: source, information available, time coverage, and acronyms used. They are listed in alphabetic order.

**Detail Report:** This is the section of the report which provides the most detail for each individual record. Records are summarized by location, starting with the project property followed by records in closest proximity.

**Distance:** The distance value is the distance between plotted points, not necessarily the distance between the sites' boundaries. All values are an approximation.

**Direction:** The direction value is the compass direction of the site in respect to the project property and/or center point of the report.

**Elevation:** The elevation value is taken from the location at which the records for the site address have been plotted. All values are an approximation. Source: Google Elevation API.

**Executive Summary:** This portion of the report is divided into 3 sections:

'Report Summary'- Displays a chart indicating how many records fall on the project property and, within the report search radii.

'Site Report Summary'-Project Property'- This section lists all the records which fall on the project property. For more details, see the 'Detail Report' section.

'Site Report Summary-Surrounding Properties'- This section summarizes all records on adjacent properties, listing them in order of proximity from the project property. For more details, see the 'Detail Report' section.

**Map Key:** The map key number is assigned according to closest proximity from the project property. Map Key numbers always start at #1. The project property will always have a map key of '1' if records are available. If there is a number in brackets beside the main number, this will indicate the number of records on that specific property. If there is no number in brackets, there is only one record for that property.

The symbol and colour used indicates 'elevation': the red inverted triangle will dictate 'ERIS Sites with Lower Elevation', the yellow triangle will dictate 'ERIS Sites with Higher Elevation' and the orange square will dictate 'ERIS Sites with Same Elevation.'

**Unplottables:** These are records that could not be mapped due to various reasons, including limited geographic information. These records may or may not be in your study area, and are included as reference.

## Appendix H

### Aerial Photographs



# HISTORICAL AERIALS

**Project Property:** San Juan County Mining  
Parcels Phase I ESA  
San Juan County  
Silverton CO

**Project No:** 900.B11

**Requested By:** Iron Woman Construction and Environmental Services LLC

**Order No:** 22100605183

**Date Completed:** October 14, 2022

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Date	Source	Scale	Comments
2021	United States Department of Agriculture	1" = 3800'	
2019	United States Department of Agriculture	1" = 3800'	
2017	United States Department of Agriculture	1" = 3800'	
2015	United States Department of Agriculture	1" = 3800'	
2013	United States Department of Agriculture	1" = 3800'	
2011	United States Department of Agriculture	1" = 3800'	
2009	United States Department of Agriculture	1" = 3800'	
2005	United States Department of Agriculture	1" = 3800'	
1998	United States Geological Survey	1" = 3800'	
1988	United States Geological Survey	1" = 3800'	
1986	United States Geological Survey	1" = 3800'	
1975	United States Geological Survey	1" = 3800'	
1972	National Aeronautics And Space Admin	1" = 3800'	
1960	Army Mapping Service	1" = 3800'	
1951	United States Geological Survey	1" = 3800'	
1945	United States Geological Survey	1" = 3800'	



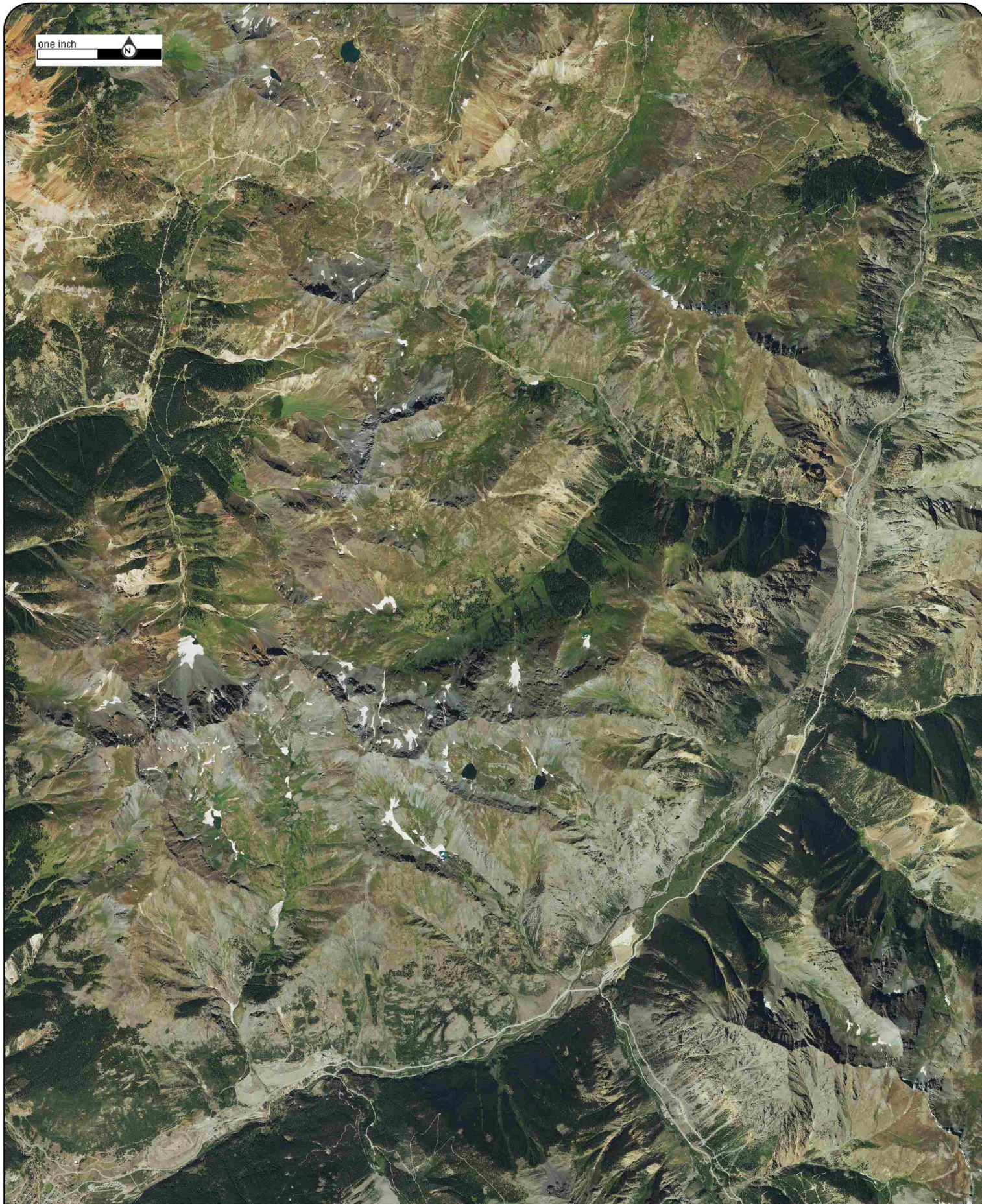


Year: 2021 Address: San Juan County, Silverton, CO  
Source: USDA Approx Center: -107.60897426,37.88390697  
Scale: 1" = 3800'  
Comment:

Order No: 22100605183





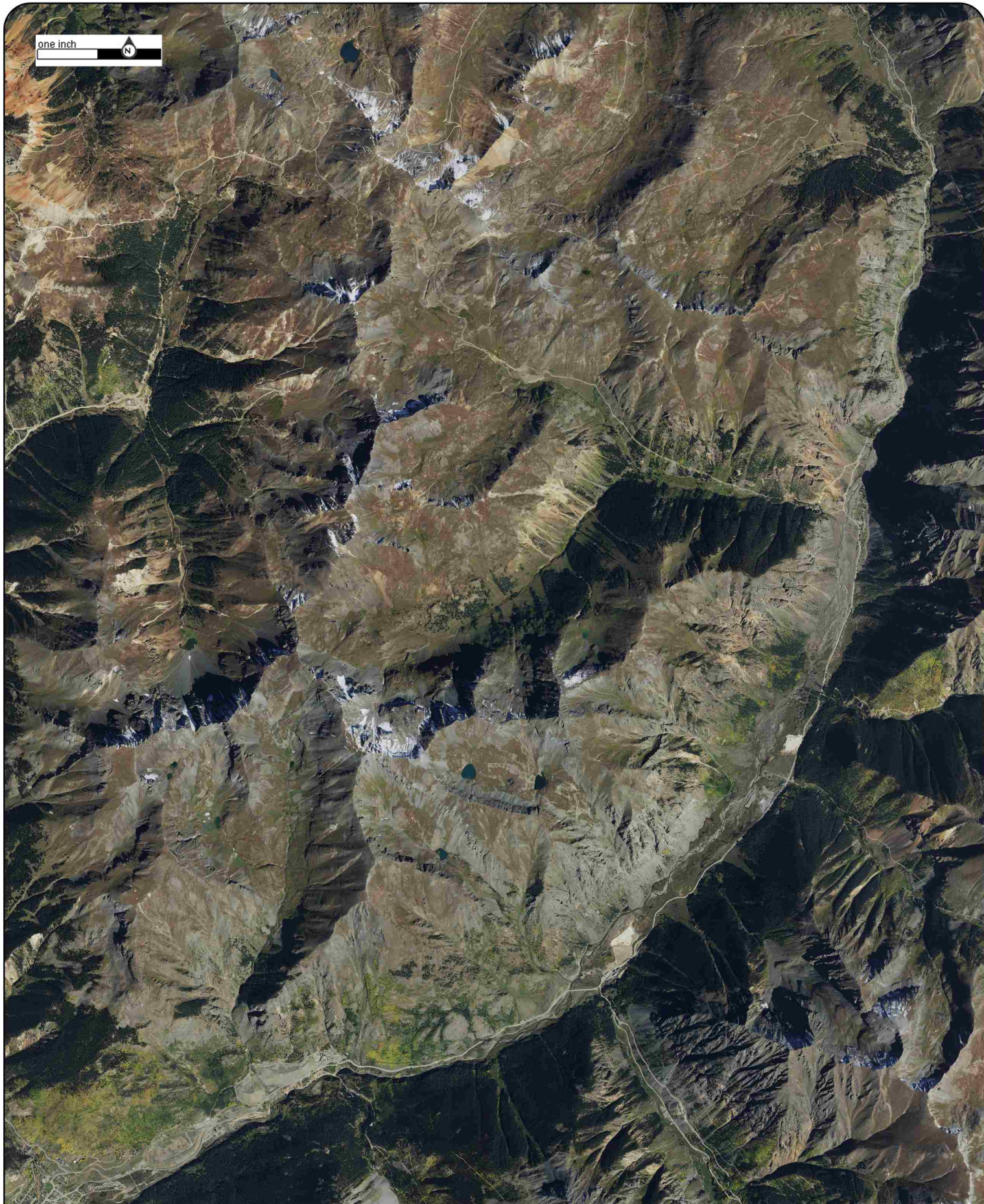


Year: 2019 Address: San Juan County, Silverton, CO  
Source: USDA Approx Center: -107.60897426,37.88390697  
Scale: 1" = 3800'  
Comment:

Order No: 22100605183







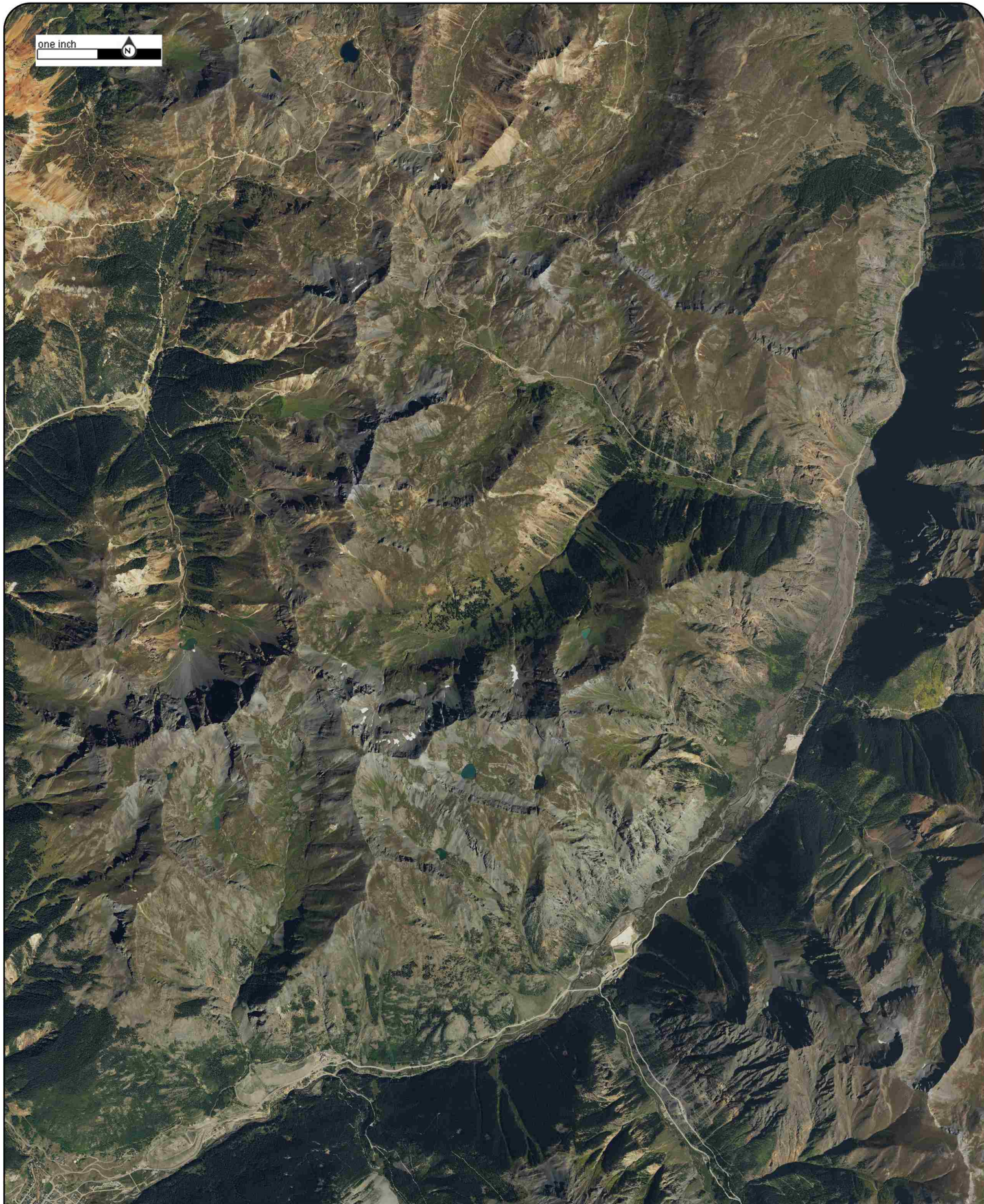
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Order No: 22100605183







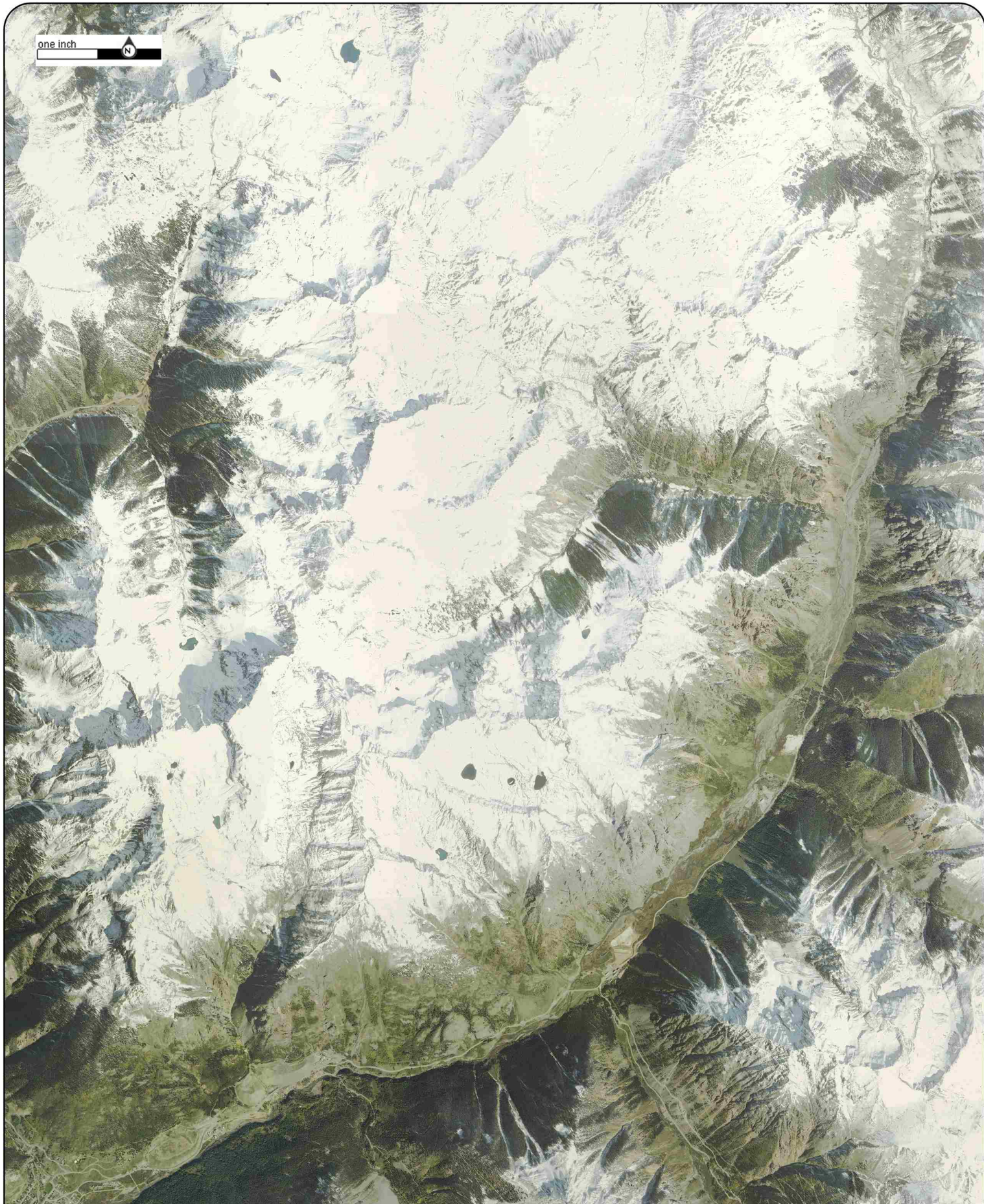
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Order No: 22100605183







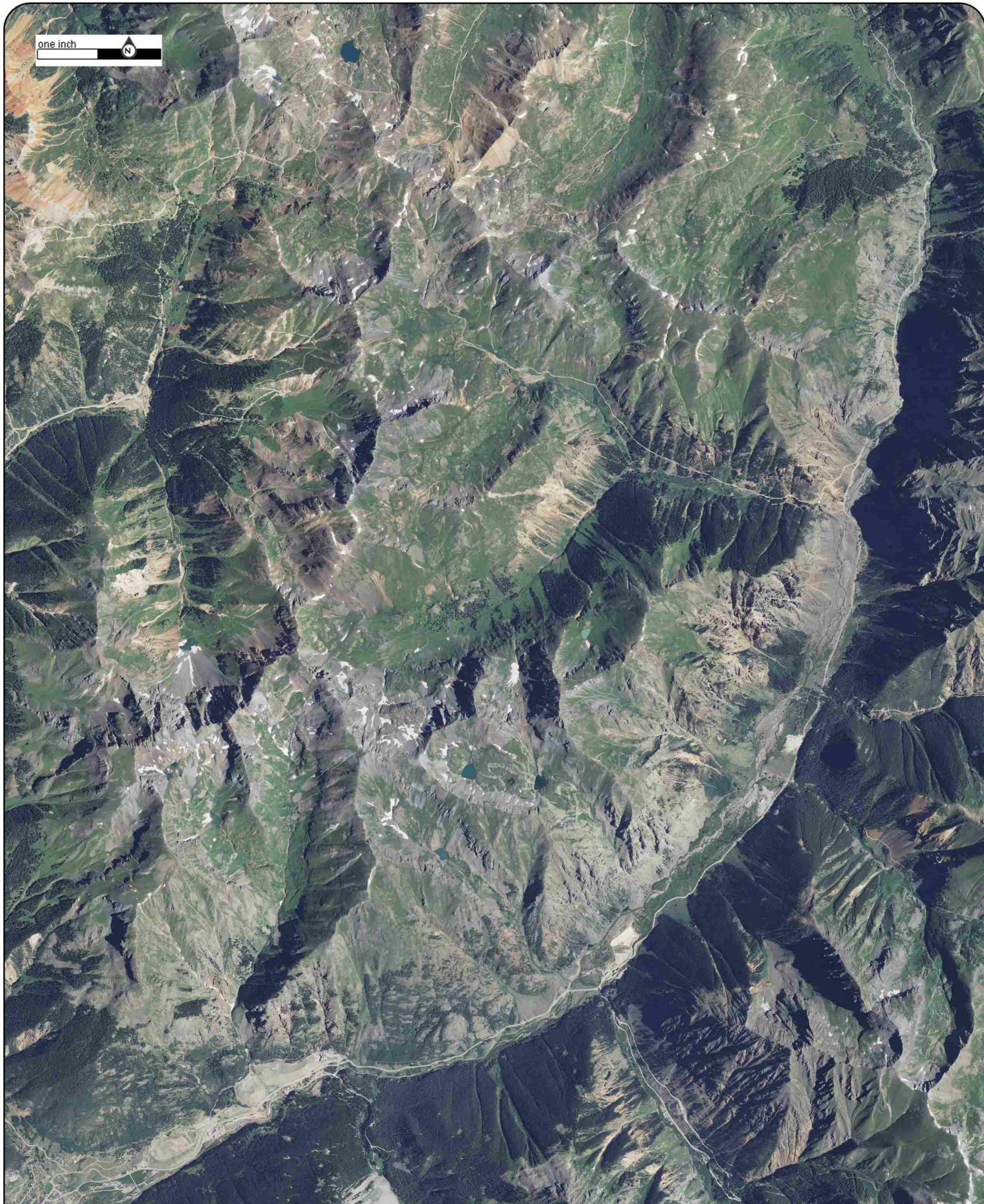
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Source: USDA  
Scale: 1" = 3800'  
Comment:

Address: San Juan County, Silverton, CO  
Approx Center: -107.60897426,37.88390697

Order No: 22100605183







Year: 2011 Address: San Juan County, Silverton, CO  
Source: USDA Approx Center: -107.60897426,37.88390697  
Scale: 1" = 3800'  
Comment:

Order No: 22100605183







Year: 2009  
Source: USDA  
Scale: 1" = 3800'  
Comment:

Address: San Juan County, Silverton, CO  
Approx Center: -107.60897426,37.88390697

Order No: 22100605183







one inch



Year: 2005  
Source: USDA  
Scale: 1" = 3800'  
Comment:

Address: San Juan County, Silverton, CO  
Approx Center: -107.60897426,37.88390697

Order No: 22100605183







Year: 1998  
Source: USGS  
Scale: 1" = 3800'  
Comment:

Address: San Juan County, Silverton, CO  
Approx Center: -107.60897426,37.88390697

Order No: 22100605183





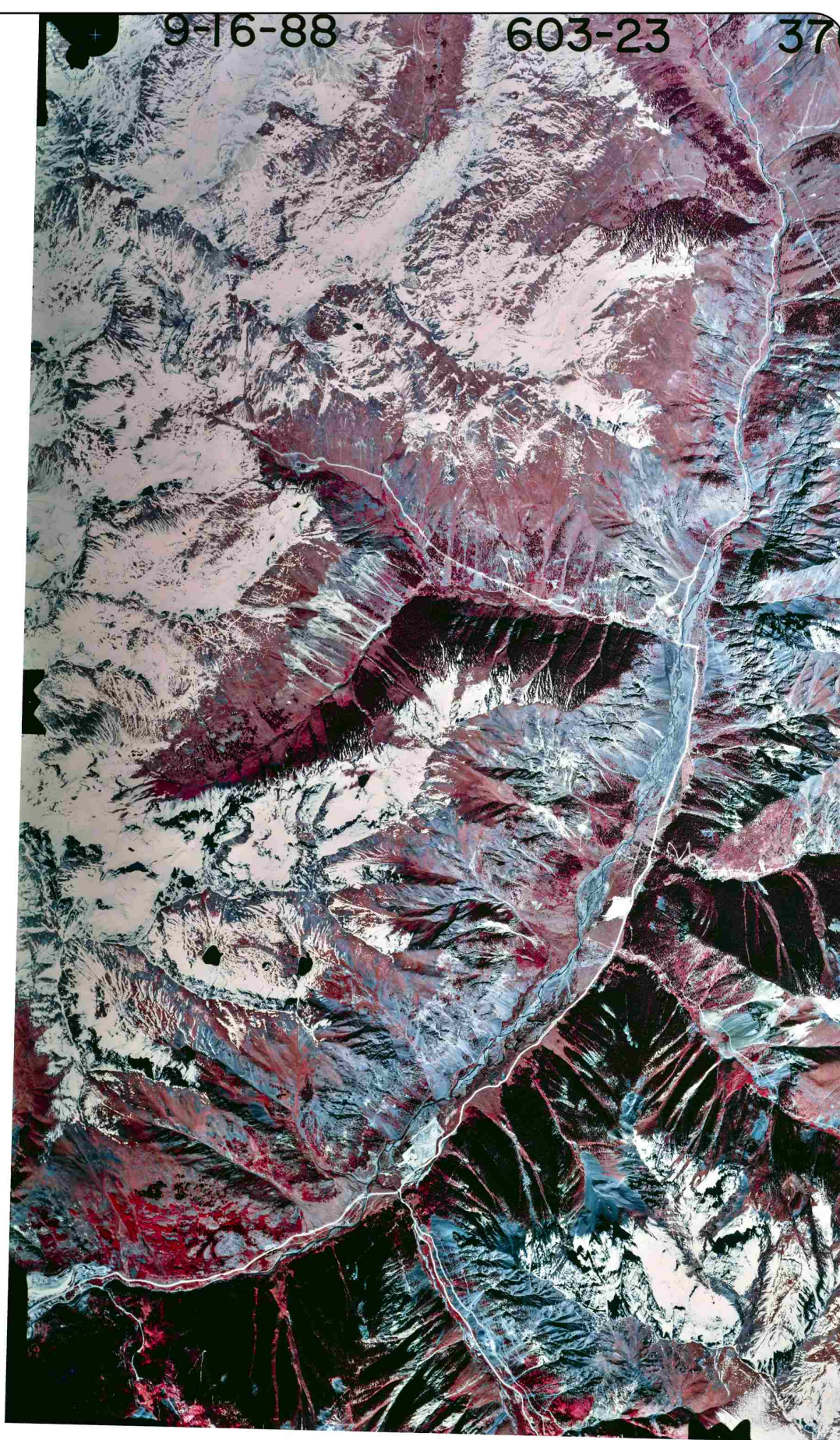
one inch



9-16-88

603-23

37



Year: 1988

Address: San Juan County, Silverton, CO

Order No: 22100605183

Source: USGS

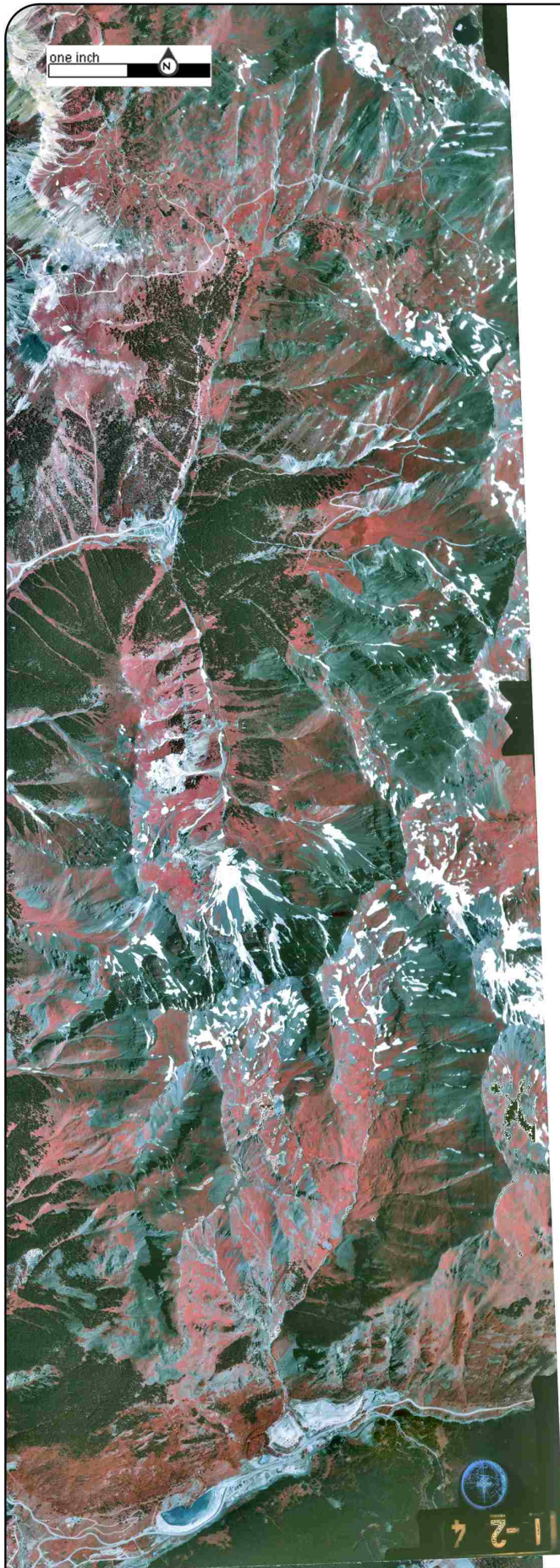
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Scale: 1" = 3800'

Comment:





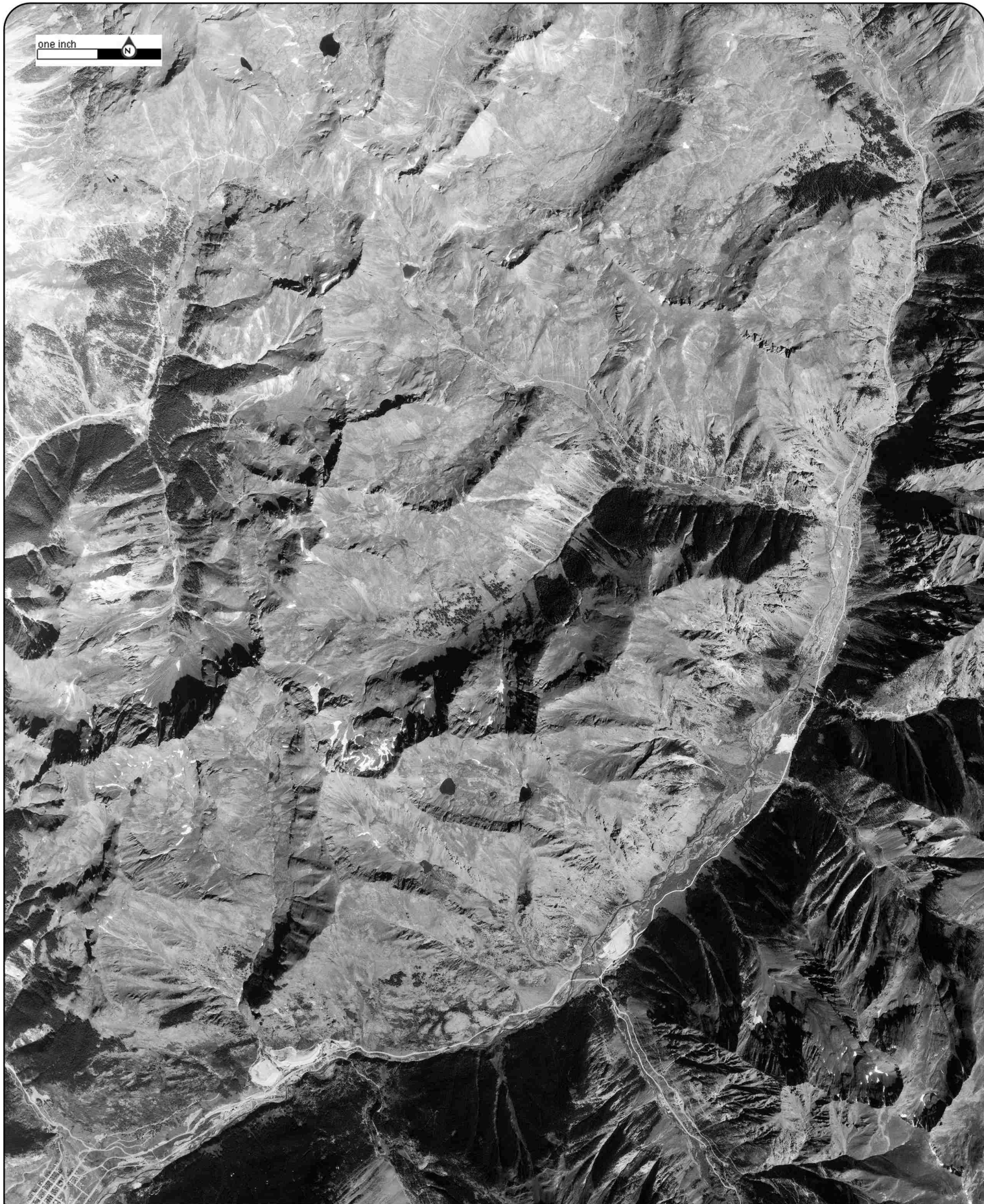


Year: 1986 Address: San Juan County, Silverton, CO  
Source: USGS Approx Center: -107.60897426,37.88390697  
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Comment:

Order No: 22100605183







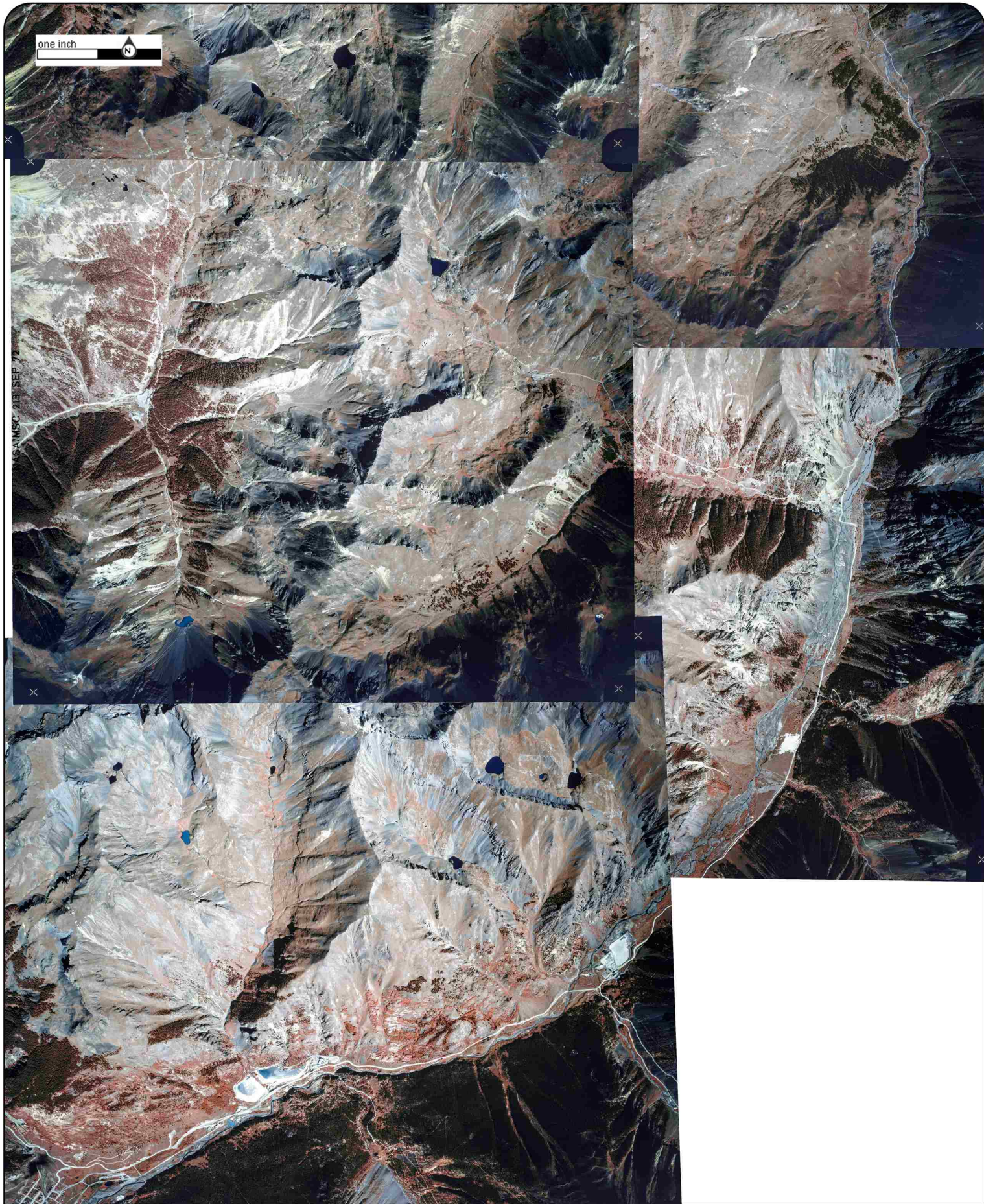
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Order No: 22100605183







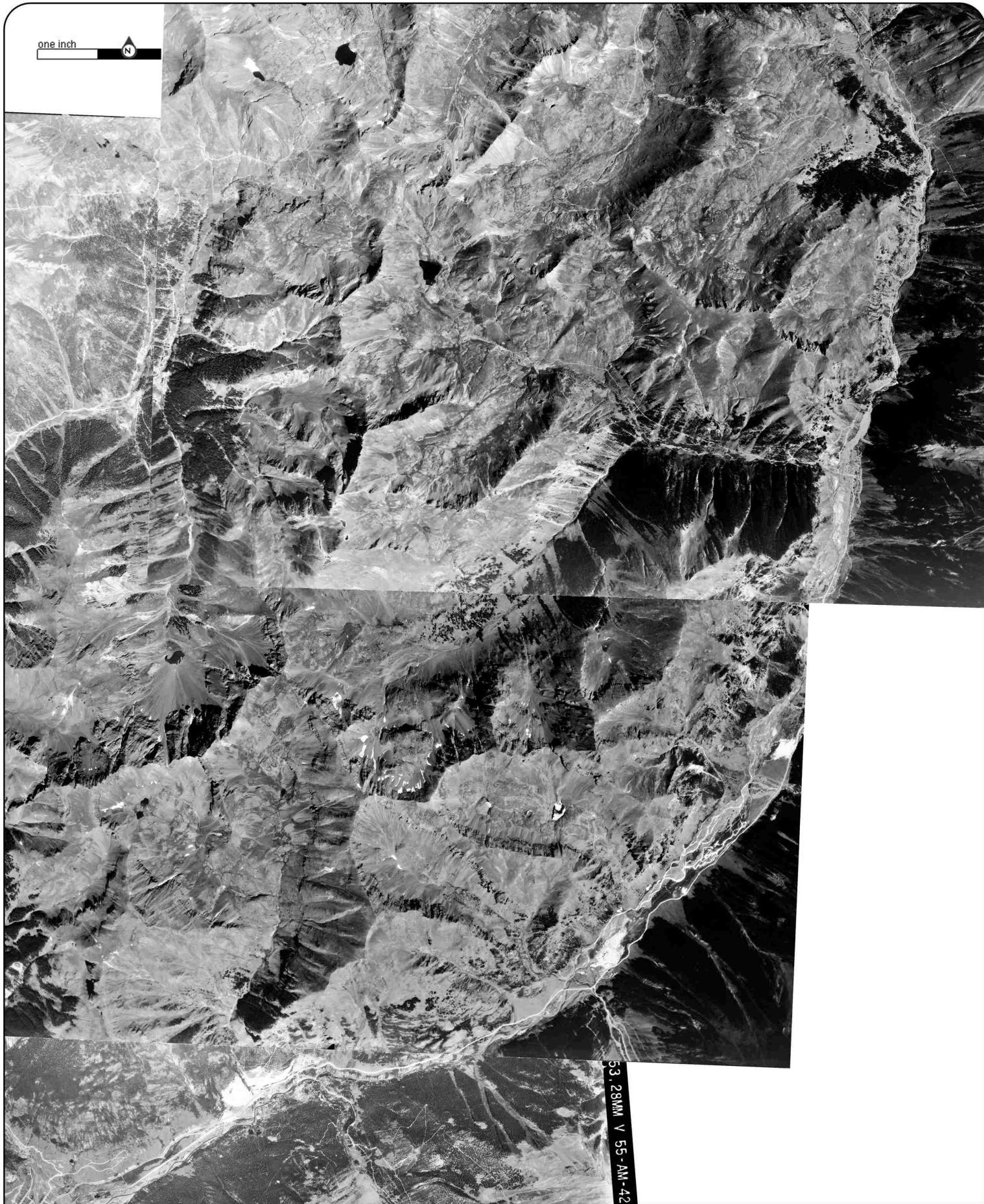
Year: 1972  
Source: NASA  
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Order No: 22100605183







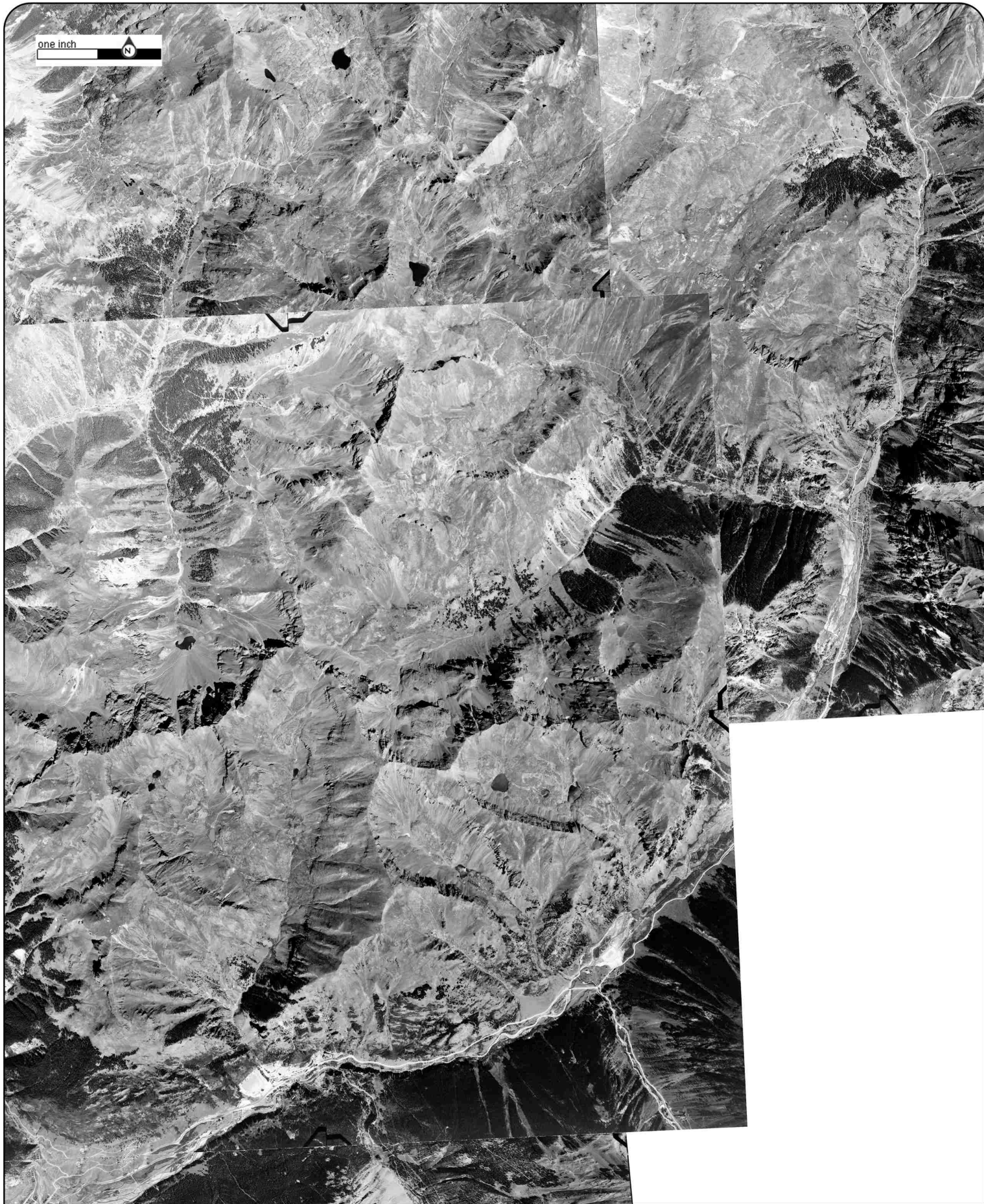
Year: 1960  
Source: AMS  
Scale: 1" = 3800'  
Comment:

Address: San Juan County, Silverton, CO  
Approx Center: -107.60897426,37.88390697

Order No: 22100605183







Year: 1951  
Source: USGS  
Scale: 1" = 3800'  
Comment:

Address: San Juan County, Silverton, CO  
Approx Center: -107.60897426,37.88390697

Order No: 22100605183







Year: 1945 Address: San Juan County, Silverton, CO  
Source: USGS Approx Center: -107.60897426,37.88390697  
Scale: 1" = 3800'  
Comment:

Order No: 22100605183





# Appendix I

## Historical Topographic Maps



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# TOPOGRAPHIC MAPS

<b>Project Property:</b>	San Juan County Mining Parcels Phase I ■ ESA San Juan County Silverton CO None
<b>Project No:</b>	900.B11
<b>Requested By:</b>	Iron Woman Construction and Environmental Services LLC
<b>Order No:</b>	22100605183
<b>Date Completed:</b>	October 11, 2022

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We have searched USGS collections of current topographic maps and historical topographic maps for the project property. Below is a list of maps found for the project property and adjacent area. Maps are from 7.5 and 15 minute topographic map series, if available.

Year	Map Series
2019	7.5
2016	7.5
2013	7.5
2001	7.5
1975	7.5
1972	7.5
1955	7.5
1955	15
1902	15
1901	15
1897	15

**Topographic Map Symbolology for the maps may be available in the following documents:**

*Pre-1947*

[Page 223 of 1918 Topographic Instructions](#)

[Page 130 of 1928 Topographic Instructions](#)

*1947-2009*

[Topographic Map Symbols](#)

*2009-present*

[US Topo Map Symbols](#)

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2019

Order No. 22100605183

Ironton	Handies Peak
Silverton	Howardville

Available Quadrangle(s): Handies Peak, CO  
Howardville, CO  
Ironton, CO  
Silverton, CO







2016

Order No. 22100605183

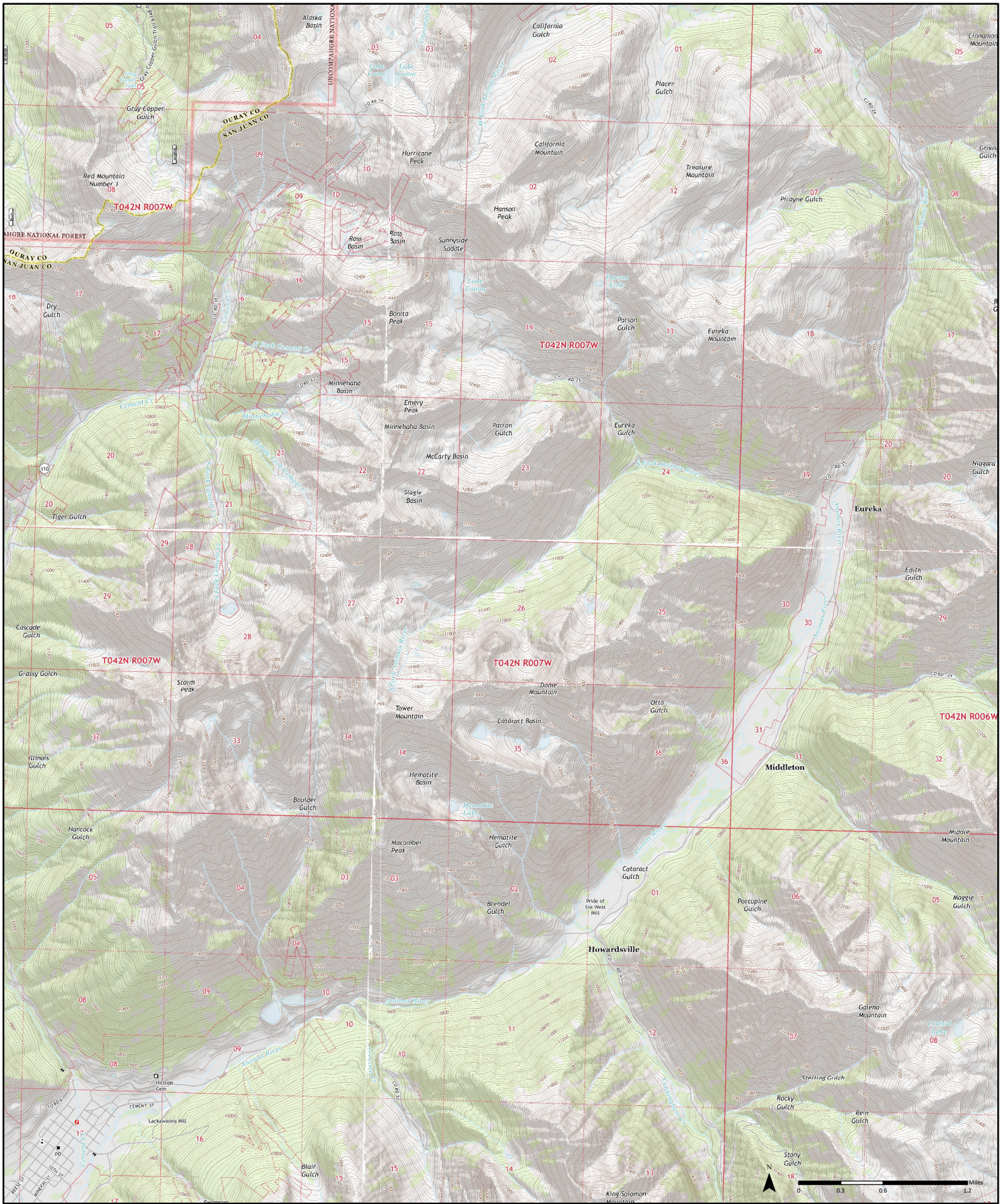
Ironton	Handies Peak
Silverton	Howardville

Available Quadrangle(s): Ironton, CO  
Howardville, CO  
Handies Peak, CO  
Silverton, CO

Source: USGS 7.5 Minute Topographic Map







2013

Order No. 22100605183

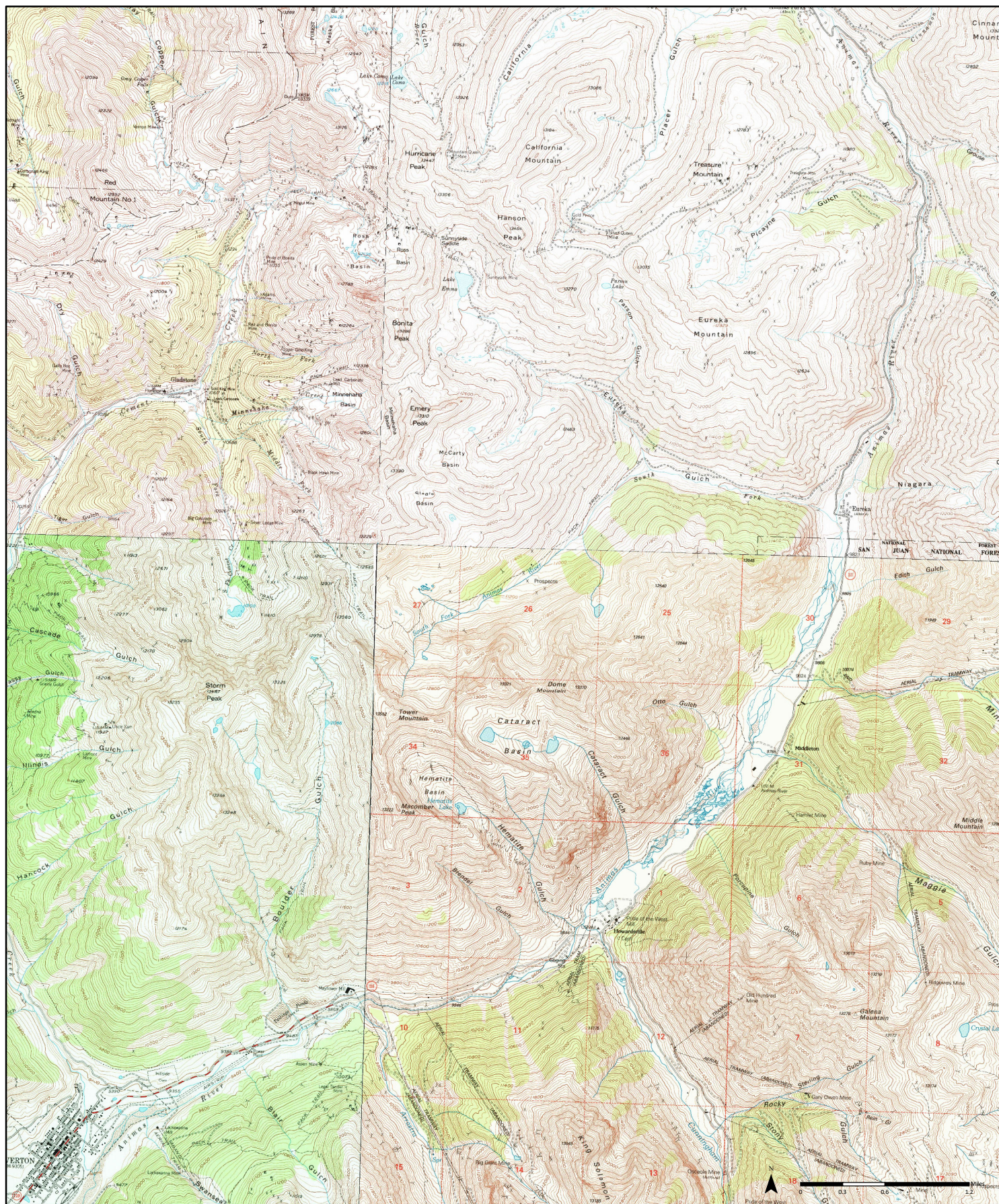
Ironton	Handies Peak
Silverton	Howardsville

Available Quadrangle(s): Handies Peak, CO  
Howardsville, CO  
Silverton, CO  
Ironton, CO

Source: USGS 7.5 Minute Topographic Map







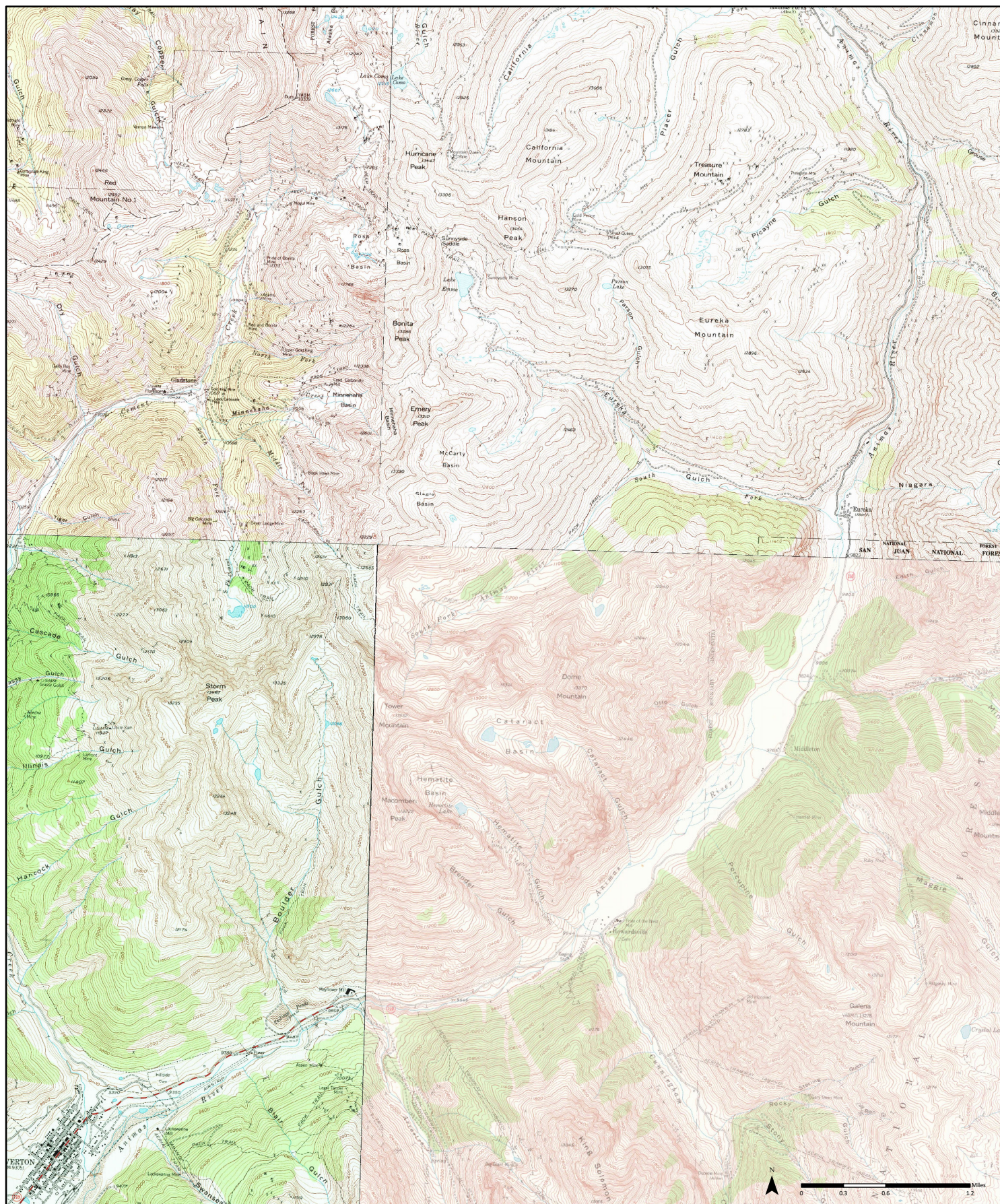
**2001** (1-1955) Aerial Photo Year: 1951 (2-1972) Aerial Photo Year: 1951 (3-2001) Aerial Photo Year: 1998 (4-1975) Aerial Photo Year: 1951

Order No. 22100605183

Ironton	Handies Peak
Silverton	Howardsville

Available Quadrangle(s): Silverton, CO<sub>(1-1955)</sub>  
 Ironton, CO<sub>(2-1972)</sub>  
 Howardsville, CO<sub>(3-2001)</sub>  
 Handies Peak, CO<sub>(4-1975)</sub>





1975

(1-1955) Aerial Photo Year: 1951

(2-1972) Aerial Photo Year: 1951

(3-1955) Aerial Photo Year: 1951

(4-1975) Aerial Photo Year: 1951

Order No. 22100605183

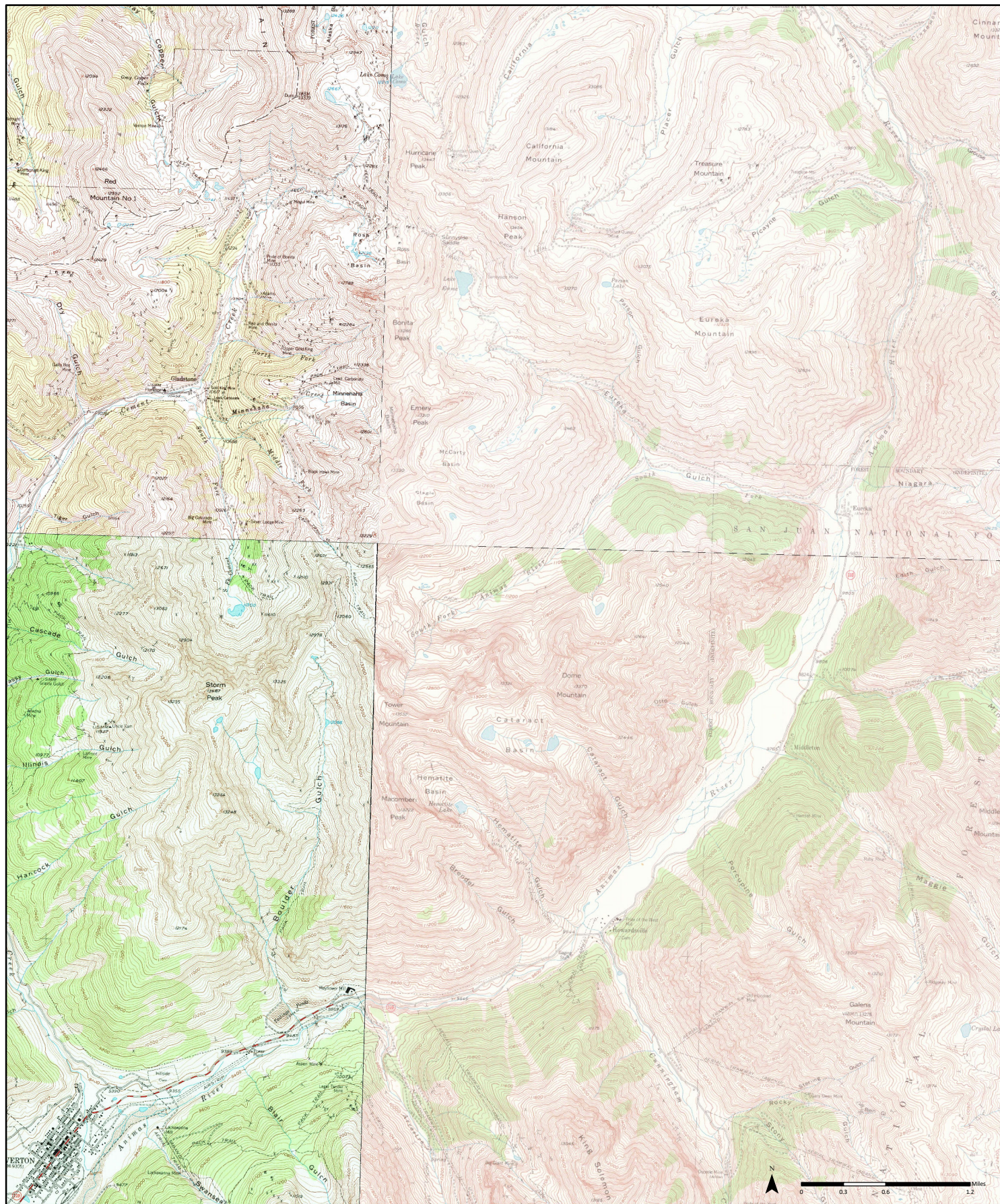
Ironton	Handies Peak
Silverton	Howardsville

Available Quadrangle(s): Silverton, CO(1-1955)  
 Ironton, CO(2-1972)  
 Howardsville, CO(3-1955)  
 Handies Peak, CO(4-1975)

Source: USGS 7.5 Minute Topographic Map







**1972**

(1-1955) Aerial Photo Year: 1951

(2-1972) Aerial Photo Year: 1951

(3-1955) Aerial Photo Year: 1951

(4-1955) Aerial Photo Year: 1951

Order No. 22100605183

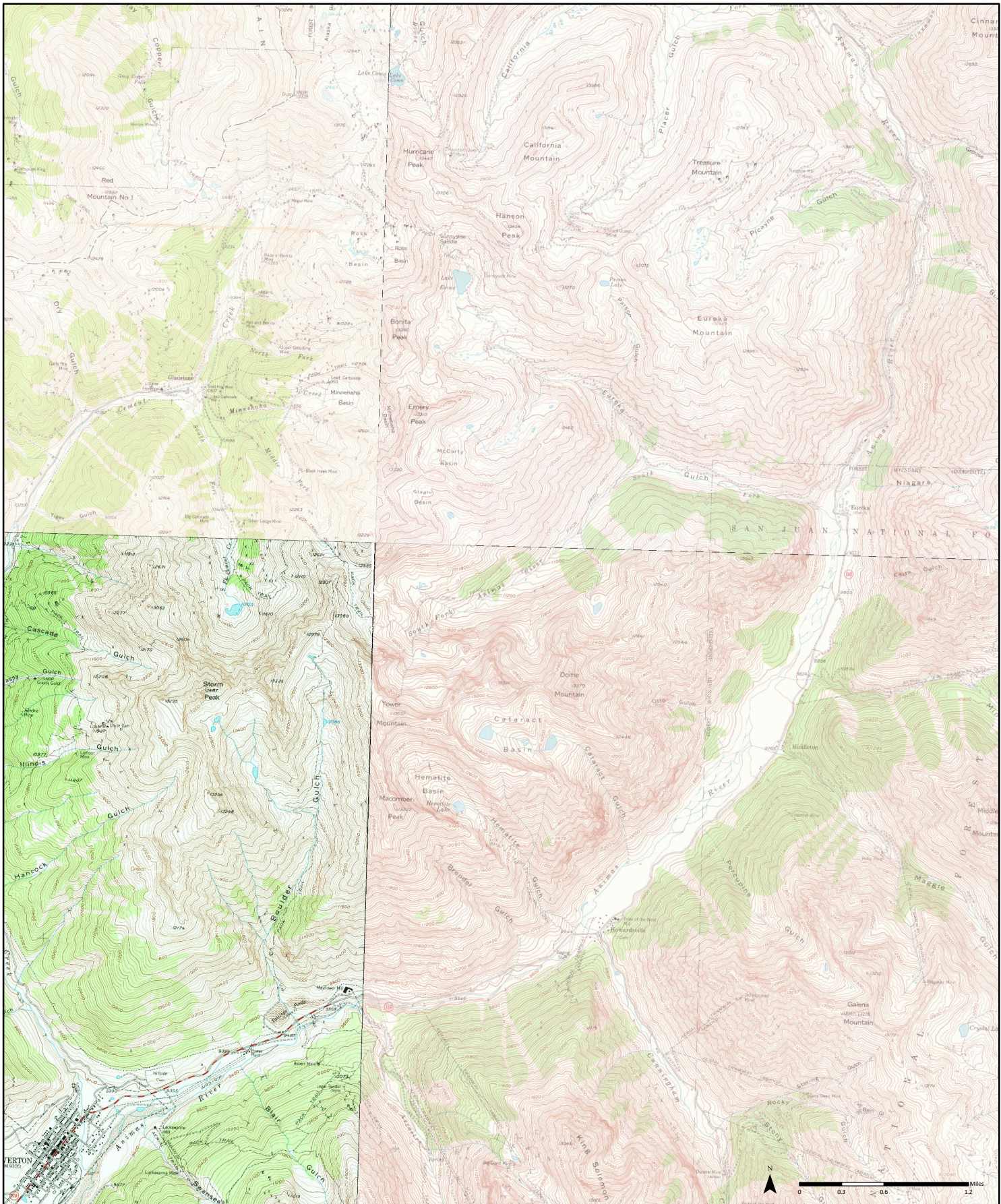
Ironton	Handies Peak
Silverton	Howardsville

Available Quadrangle(s): **Silverton, CO**(1-1955)  
**Ironton, CO**(2-1972)  
**Handies Peak, CO**(3-1955)  
**Howardsville, CO**(4-1955)

Source: USGS 7.5 Minute Topographic Map







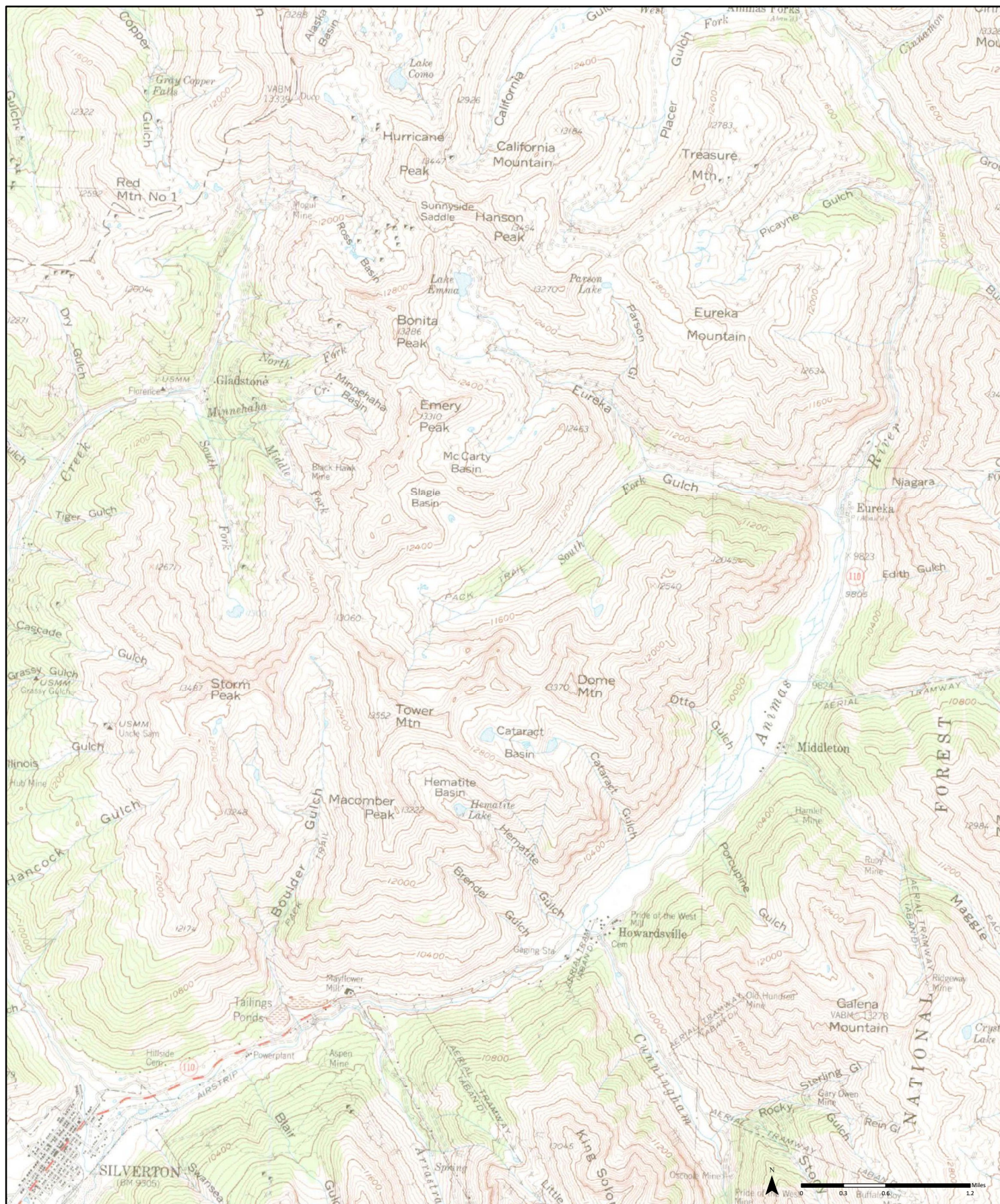
**1955** (1-1955) Aerial Photo Year: 1951 (2-1955) Aerial Photo Year: 1951 (3-1955) Aerial Photo Year: 1951 (4-1955) Aerial Photo Year: 1951

Order No. 22100605183

Ironton	Handies Peak
Silverton	Howardsville

Available Quadrangle(s): **Silverton, CO**(1-1955)  
**Handies Peak, CO**(2-1955)  
**Ironton, CO**(3-1955)  
**Howardsville, CO**(4-1955)





1955

(1-1955)  
Aerial Photo Year: 1951

Order No. 22100605183



Available Quadrangle(s): Silverton, CO(1-1955)

Source: USGS 15 Minute Topographic Map







**1902** Order No. 22100605183

Available Quadrangle(s): Silverton, CO

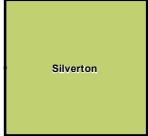
Silverton





1901

Order No. 22100605183

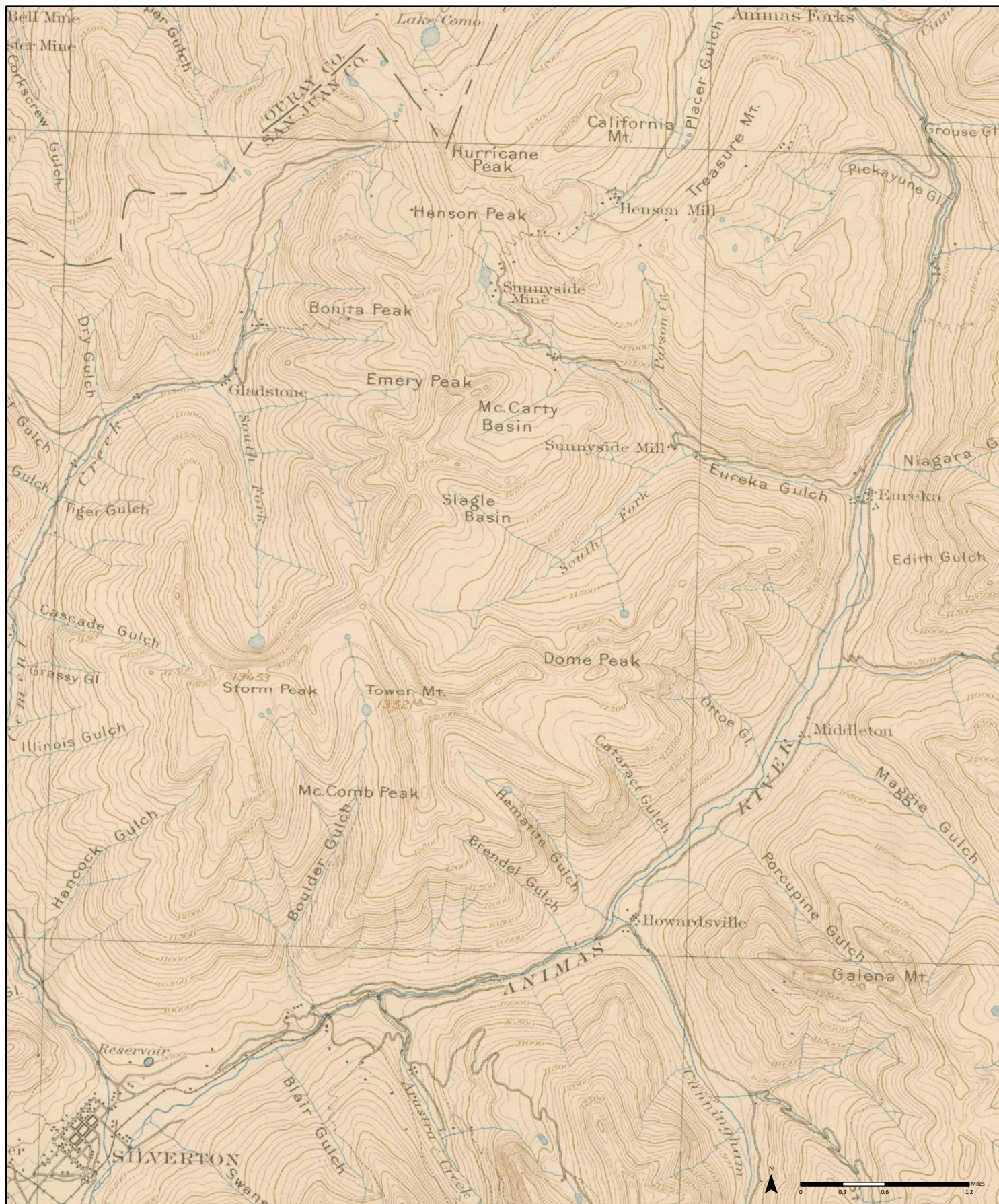


Available Quadrangle(s): Silverton, CO

Source: USGS 15 Minute Topographic Map







1897

Order No. 22100605183



Available Quadrangle(s): Silverton, CO

Source: USGS 15 Minute Topographic Map



## Appendix J

### Photographs



Parcel 47750150050001



Grand View Claim Parcel 47750150050001





AD Searl, Daneburg, Hilderbrand Claims Parcel 47750230050002



Waterloo Claim (Parcel 47750150050011), Emma #1, Emma #2, Smuggler Claims  
(Parcel 47750160050006)





George Washington Mine closure by DRMS Parcel 47750150050001



Parcel 47730190050004





Parcel 47750090050001



Emma Claim-Open Cut approximately 8 feet deep  
Parcel 47750100050003





Midnight Claim Parcel 47750100050031



Taggart Mining Claim Parcel 47750100050051





Parcel 47750110050002



Parcels 47750130050001 and 47750130050003





Sunnyside Basin Claims Group Parcel 47750140050002



Boiler House remnants on Raymond Claim Parcel 47750140050002





Clipper Claim open cut closure by DRMS Parcel 47750140050002



Former Lake Emma Parcel 47750140050002





Last Chance Tunnel into Sunnyside Mine. Grate  
approximately 50 feet inside.



Mine water reclamation pond Parcel 47750140050002





Powder Magazine on Parcel 47750140050002



Parcel 47750150050001





Silver King Claim Parcel 47750150050002



Mine tailings on Parcel 47750240050001

# Appendix K

## SGC Regulatory Correspondence



**SUNNYSIDE GOLD CORPORATION**  
**AN ECHO BAY COMPANY**

P.O. Box 177 • Silverton, CO 81433  
Phone (970) 387-5533 • Fax (970) 387-5310

September 25, 2003

Wallace H. Erickson  
Environmental Protection Specialist  
Division of Minerals and Geology  
701 Camino del Rio, Room 125  
Durango, CO 81301

Received  
OCT 01 2003  
Durango Field Office  
Division of Minerals & Geology

**RE: Sunnyside Mine, Permit No. M-77-378**  
**AR-2 Reclamation Report – Request for Reclamation Responsibility Release**

Dear Mr. Erickson:

Sunnyside Gold Corporation (Sunnyside) submits this request for permit land area release and bond reduction according to the provisions of the Hard Rock/Metal Mining Rule 4.16. The areas included in this request are the remaining area around the Mayflower Mill, Tailings Pond #1, Tailings Pond #2 and Tailings Pond #3. These areas are colored on the enclosed reclamation maps.

The corresponding bonds for these areas (mainly monitoring and maintenance) have been dropped from the proposed bond (attached with proposed changes). Also included in the proposed bond reduction is the bond for replacement of the American Tunnel and Terry Tunnel bulkheads since they have been completed and met their performance review period with no problems. Because of the additional work committed to for the Power Plant Tailings Project, the bond in the disposal area has been increased. Most of the work will be completed on this project and reclamation of Tailings Pond No.4 over the next few weeks leaving Sunnyside's bond amount well in excess of that required for completion of reclamation.

Sunnyside believes the areas included in the release request are stable, meet their post mining land use and qualify for removal from the permit area.

The areas in this request belong to Sunnyside, San Juan County Historical Society, Larry Perino and include some areas held by Sunnyside under the General Mining Law of 1872 as un-patented mill-site claims (BLM).



The addresses and telephone numbers for the owners other than Sunnyside are as follows;

San Juan County Historical Society  
Beverly Rich  
PO Box 154  
Silverton, CO 81433  
Telephone: 970-387-5488 (daytime work number)

Larry Perino  
PO Box 317  
Silverton, CO 81433  
Telephone: 970-387-5533 (daytime work number)

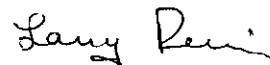
Bureau of Land Management  
San Juan Field Office  
15 Burnett Court  
Durango, CO 81301  
Telephone: 970-247-4878

Attached to this request are the following:

1. Reclamation report including a signed statement that all applicable portions of the reclamation plan have been satisfied in accordance with the rules and all applicable requirements under the Act.
2. Photographs of the reclaimed areas. Also included are photographs taken under pre-drought conditions.
3. Reclamation plan map with the areas this release request covers outlined in color.
4. Revised Exhibit L – Reclamation Cost Estimate with proposed changes.
5. An evaluation that Sunnyside's reclamation work has minimized impact to the hydrological balance from the areas covered by this land area reduction.

Please notify me if any additional information is required for the Division to schedule an inspection of these areas and rule on this request.

Sincerely,



Larry Perino  
Reclamation Manager

## RECLAMATION REPORT SUMMARY

### Mayflower Mill Area

- 1991-1993. General site cleanup and minor drainage improvements were carried out.
- 1993-1995. Slope grading, removing isolated pockets of tailings and planting of slopes were completed. The graded slopes were planted with the Mountain Mix approved for the site, mulched with hay and fertilized with liquid fertilizer.
- The land use was changed to an interpretive museum in 1996 (AM-004) and the site was deeded to the San Juan County Historical Society. Funding for maintenance and conversion to a tour accompanied the transfer. They operated the site for part of the year as an interpretive museum tour.
- In 1998 the mill buildings and surrounding grounds were removed from the permit area (SR-02).
- In 1998, under the Consent Decree Agreement with CDPHE and TR-21 for area within the permit area, an interceptor structure was placed in a major drainage above the Mayflower Mill to intercept and divert water (that had been passing under the site) around the site. A lined upslope diversion ditch was also constructed to divert surface runoff around the site. Disturbed areas were planted with the Mountain Mix approved for the site.

### Tailings Pond No.1

- Tailings Pond No.1 dates back to the 1930's and was last used in the 1970's when a breach occurred. The reclamation plan in place in 1985 when Sunnyside obtained the property involved grading the top of the pond to drain to the hillside and direct revegetation of the tailings using peat moss as a growth media in furrows on the embankments. The embankment slopes ranged from 1.5:1 to 0.75:1 and were at the waters edge along Boulder Creek and the Highway 110B drainage ditch.  
Sunnyside revised this plan in 1992 (TR-13). The plan was modified to include a geotechnical study to assure stability, reduction of the slope embankment to 2.5:1 with localized areas at 5:1, moving the toe back from Boulder Creek and the Highway 110B drainage ditch, grading the top to drain to the hillside, capping with subsoil material and planting with the Mountain Mix.  
This work was completed in 1992.
- 1993-1996. Fertilization with liquid fertilizer, spot seeding and planting of aspen trees, shrubs and wildflowers according to the accepted plan was completed along with armoring of erosion areas.
- In 1998-1999, under the Consent Decree Agreement with CDPHE and TR-21 for areas within the permit area, interceptor structures were placed in two major

drainages above Tailings Pond No.1 to intercept and divert water (that had been passing under the site) around the site. A lined upslope diversion ditch was also constructed at the pond slope interface to divert surface runoff around the site. Disturbed areas were planted with the Mountain Mix approved for the site.

### **Tailings Pond No.2**

- Tailings Pond No.2 also dates back to the 1930's and was last used in the 1970's when the breach in Tailings Pond No.1 occurred. The reclamation plan in place in 1985 when Sunnyside obtained the property also involved grading the top of the pond to drain to the hillside and direct revegetation of the tailings using peat moss as a growth media in furrows on the embankments. The embankment slopes ranged from 1.5:1 to 0.75:1 and were at the waters edge along Boulder Creek. Sunnyside revised this plan in 1991 (TR-11). The plan was modified to include a geotechnical study to assure stability, reduction of the slope embankment to 2.5:1, moving the toe back from Boulder Creek, grading the top to drain to the hillside, capping with subsoil material and planting with the Mountain Mix. This work was completed in 1991.
- 1993-1996. Fertilization with liquid fertilizer, spot seeding and planting of aspen trees, shrubs and wildflowers according to the accepted plan were completed.

### **Tailings Pond No.3**

- Tailings Pond No.3 was reclaimed in 1992-1993 according to the reclamation plan. It was capped with subsoil material to grade towards the hillside and planted with the Mountain Mix.
- During 1993-1996, maintenance of the area through spot seeding, fertilization, limestone amendment and planting of trees, shrubs and wildflowers according to the reclamation plan were completed.

## **Impact to the Hydrological Balance**

Site monitoring of water quality has been a MLR permit requirement. The monitoring stations applicable to these sites (Mayflower Mill, Tailings Pond No.1, Tailings Pond No.2 and Tailings Pond No.3) are as follows;

Boulder Creek sites BC-1 (above) and BC-2 (below) were monitored for impact from Tailings Pond No.1 and Tailings Pond No.2 since this stream segment passes in close proximity to the ponds. BC-2 is near the confluence of Boulder Creek and the Animas River. This data is included with the request.

The monitoring data spans from 1986 to the present. While no monitoring data exists for pre-Sunnyside periods, the Tailings Pond No.2 slope was extremely steep (0.75:1) from wind deposition. These tailings were washed into Boulder Creek during storm events. The Tailings Pond No.1 slope (although flatter (2:1) was similar. In addition, the Tailings Pond No.1 slope formed part of the Highway 110 drainage ditch where storm events carried tailings to Boulder Creek.

These conditions were mitigated with the change and implementation of the revised reclamation plan. Upland diversions were also placed to divert water around the tailings to provide additional mitigation efforts. None of these improvements were in the original reclamation plan.

From the Boulder Creek data, it can be seen that the differential between above and below has been reduced. Manganese and zinc are the two parameters that had the largest differential. A graph is included with these parameters plotted.

SCTP3-1 (above) and SCTP3-2 (below) were monitored for impact from Tailings Pond No.3. This stream segment passes along the toe of Tailings Pond No.3 on its way to the Animas River. This drainage has shown relatively little differential between above the site and below except during and shortly after Tailings Pond No.3 reclamation. At the present any differential is minor. A graph of manganese and zinc is included with the data.

AR-3.5 (above) and AR-4 (below) are facility-monitoring stations on the Animas River that span these areas but also include additional areas to the southwest that are currently under reclamation (Power Plant tailings area and Tailings Pond No.4) as well as other features not related to the facilities. A graph of manganese and zinc is also included for these above and below monitoring stations. While there is a differential in the data from these paired sites, the differential appears to be narrowing and is expected to narrow more with the three projects currently being implemented (Tailings Pond No.4 reclamation, Power Plant Tailings removal and Passive Treatment Wall installation) and the short term construction impacts subside. Sunnyside has made considerable effort to minimize

impact from the Mayflower facilities by attempting to isolate them from exposure to water to the extent possible given the age of the facilities.

Sunnyside has through its reclamation efforts satisfied all applicable portions of the area reclamation plans in accordance with the Hard Rock/Metal Mining Rules and all applicable requirements under the Act for the remaining permit area near the Mayflower Mill, Tailings Pond No.1, Tailings Pond No.2 and Tailings Pond No.3 areas included in this report and corresponding request for release from further reclamation responsibility for the same areas.

Sunnyside Gold Corporation

By: Larry Perino

Larry Perino

Title: Reclamation Manager

Date: Sept 25, 2003



**SUNNYSIDE BASIN/LAKE EMMA**

Page 1 of 3

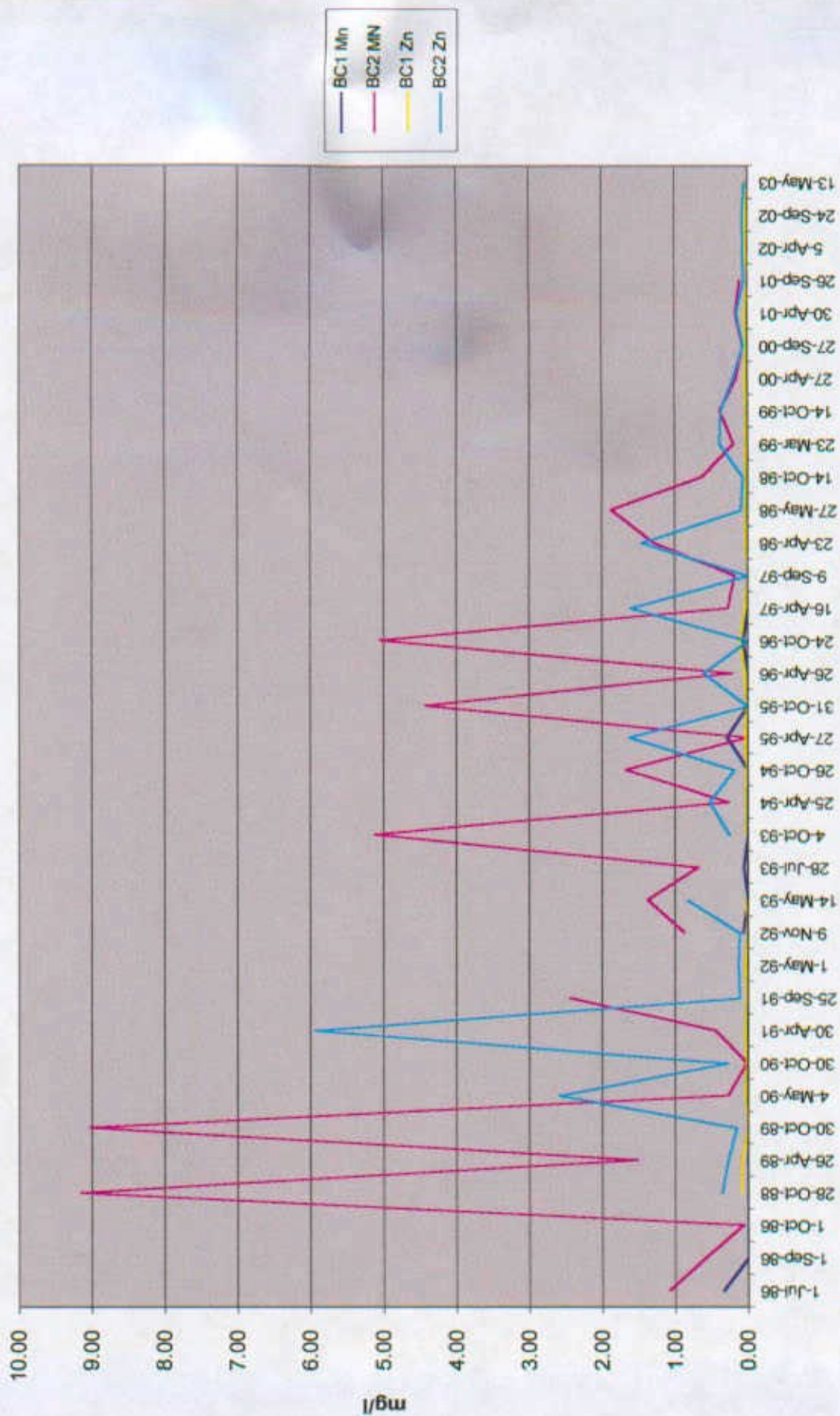
[illegible]

		*****CURRENT BOND*****		*****PROPOSED BOND*****	
		Unit Cost \$	Unit Quantity	Unit Cost \$	Unit Quantity
				Extended Cost \$	Extended Cost \$
<b>Tailings Pond No.1</b>					
-Riprap Side Outfall of Pond		\$10	C.Y.	700	\$7,000
-Monitoring & Maintenance		\$3,600	L.S.	1	\$3,600
<b>Tailings Pond No.2</b>					
-Riprap Side Outfall of Pond		\$10	C.Y.	400	\$4,000
-Monitoring & Maintenance		\$3,220	L.S.	1	\$3,220
<b>Tailings Pond No.4</b>					
-Grade Upper Surface		\$2	C.Y.	70000	\$140,000
-Fine Grade Pond		\$150	acre	16	\$2,400
-Tailings Amendment		\$1,000	acre	16	\$16,000
-Seed, Mulch, Fertilize		\$1,000	acre	16	\$16,000
-Borrow Area-Seed, Mulch, Fertilize		\$800	acre	5	\$4,000
-Riprap Side Outfall of Pond		\$20,500	L.S.	1	\$20,500
-Monitoring & Maintenance					
<b>Engineering Building, Shop &amp; Settling Pond Area</b>					
-Monitoring & Maintenance		\$1,250	L.S.	1	\$1,250
<b>Subtotal Mayflower Mill Tailings Ponds</b>					
				\$239,198	\$257,878
<b>Contingency, Administration, Contractor Profit, Per Diem</b>					
				\$163,007	\$91,327
<b>TERRY TUNNEL &amp; AMERICAN TUNNEL BULKHEAD REPLACEMENT</b>					
-Bulkhead Replacement		\$697,000	L.S.	1	\$697,000
<b>TOTAL BOND</b>					
				\$1,250,000	\$600,000

**Notes:**

- 1) Mobilization and demobilization costs are included in the cost estimate
- 2) Monitoring and maintenance costs were left intact for areas in the permit area

# Boulder Creek



AC 1

AC 1

Station	Sample Date	Omgd	Field-pH	labcode	TDS(180)				Sulfate				CO3 NO3&NO2				NH3-N	Cyanide	Fl	dCd	dHg	dPb	dAg	dCu	dMn	dFe	dZn
					mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L											
BC1	01-Jul-86	7.0	124	116	2	26	0	57	32	29	0	0.20	0.06	0.001	0.453	0.000	0.000	0.00	0.00	0.01	0.00	0.00	0.00	0.02	0.03	0.20	0.04
BC1	01-Jul-86	1.3	40	179	3	6	0	18	8	12	0	0.11	0.12	0.006	0.579	0.001	0.000	0.01	0.00	0.03	0.00	0.01	0.09	0.08	0.12	0.02	
BC1	01-Sep-86	6.28		34	1																						
BC1	01-Oct-86	6.77		54	3																						
BC1	26-Oct-86	8.24	155	104	12	34	nd	79	41.0	40.0	0.0	0.14	0.37	nd	0.23	0.002	nd	0.06	nd	0.10	nd	0.01	0.49	0.34	0.10	0.10	
BC1	28-Apr-86	5.23	94	26	7	19	nd	63	23.0	13.0	0.0	0.17	nd	0.39	0.39	nd	nd	nd	nd	0.10	nd	0.01	nd	nd	0.09	0.09	
BC1	30-Oct-86	1.17	168	202	2	28	0	33	33.8	36.6	0.0	0.21	<0.01	<0.005	0.27	0.002	nd	nd	nd	nd	nd	0.02	nd	nd	0.04	0.04	
BC1	04-May-90	1.89	122	74	<5	21	0	52	25.6	31.9	0.05	0.42	0.00	0.07	<0.005	3.21	<0.001	<0.004	<0.01	<0.02	<0.01	<0.05	<0.02	0.18	0.03	0.04	
BC1	30-Oct-90	2.00	783	118	42	3	27	0	60	33.6	28.6	0.0	0.06	<0.01	0.63	<0.005	<0.005	<0.004	<0.01	<0.10	<0.02	<0.01	<0.05	<0.02	0.20	0.04	
BC1	30-Apr-91	1.22	658	149	84	2	24	0	55	28.7	23.5	<0.04	<0.01	0.20	<0.002	<0.001	<0.02	<0.01	<0.02	<0.01	<0.02	<0.01	<0.05	<0.02	0.19	0.02	
BC1	25-Sep-91	0.9	72	102	<1	31	0	60	37.8	13.1	0	0.08	<0.01	0.20	<0.002	<0.001	<0.02	<0.01	<0.10	<0.02	<0.01	<0.05	<0.02	0.08	0.04	0.04	
BC1	01-May-92	7.1	7.2	64	46	1	16	<1	36	21.4	33.7	0	0.1	<0.02	0.11	0.19	<0.02	<0.01	<0.10	<0.02	<0.01	<0.05	<0.02	0.08	0.04	0.04	
BC1	09-Nov-92	0.4	74	106	1	28	75	34.8	46.7	46.7	<1	0.18	0.01	0.27	<0.02	<0.001	<0.01	<0.01	<1	<0.02	<0.005	<0.05	<0.02	0.42	0.01	0.01	
BC1	14-May-93	10.7	74	40	2	21	33	25	14	14	0	0.24	0.05	<0.01	0.16	<0.002	<0.001	<0.006	<0.001	<1	<0.02	<0.01	<0.05	<0.02	<5	0.03	
BC1	26-Jul-93	6.0	6.6																								
BC1	04-Oct-93	1.1	ND	80	4	26	<1	56	35	37	0	0.1	0.09	<0.01	0.25	<0.02	<0.001	<0.006	<0.001	<1	<0.02	<0.001	<0.05	0.07	<5	0.03	
BC1	25-Apr-94	3.2	7.3	54	1	16	40	19		19	0	0.37	0.1	<0.01	0.19	<0.02	<0.001	<0.006	<0.001	<1	<0.02	0.008	<0.05	<0.02	0.1	0.03	
BC1	26-Oct-94	2.6	6.6	120	84	<1	40	56	48	26	0	0.13	<0.05	0.11	<0.02	<0.001	<0.006	<0.001	<1	<0.02	0.004	<0.05	0.06	0.2	0.02	0.03	
BC1	27-Apr-95	1.1	7.1	102	1	26	67	34	36	36	0	0.31	0.15	<0.05	0.36	<0.02	<0.001	<0.006	<0.001	<1	<0.02	<0.005	<0.05	<0.02	0.3	0.04	
BC1	31-Oct-95	0.6	7.4	186	<2	36	68	44.4	47.4	47.4	0	0.25	0.18	<0.01	0.36	<0.02	<0.001	<0.006	0.001	<1	<0.02	0.022	<0.05	<0.02	0.4	0.02	
BC1	26-Apr-96	3.4	7.3	80	82	<2	36	36	24.4	18.5	<1	0.4	<0.05	0.03	0.21	<0.001	<0.006	<0.001	<0.05	<0.01	<0.02	<0.01	<0.025	<0.02	0.14	0.05	
BC1	24-Oct-96	1.1	6.6	84	<2	26	60	33.7	36.9	36.9	<1	<0.05	<0.01	<0.05	0.29	<0.001	<0.001	<0.006	<0.001	<0.05	<0.01	<0.003	<0.025	0.29	0.23	0.11	
BC1	16-Apr-97	ND	7.2	90	<2	26	72	34.2	43.6	43.6	<1	0.36	<0.05	<0.01	0.46	<0.01	<0.001	<0.006	<0.001	<0.05	<0.01	0.008	<0.02	<0.005	0.32	0.04	
BC1	09-Sep-97	1.2	6.5	120	<2	32	52	36	33	33	<1	<0.05	<0.05	<0.01	0.29	<0.01	<0.001	<0.006	<0.001	<0.05	<0.01	<0.01	<0.02	<0.005	0.2	<0.025	
BC1	23-Apr-98	1.1	7.4	70	<2	23	46	28	25	25	0	0.33	0.05	<0.01	0.3	<0.01	<0.001	<0.006	<0.001	<0.05	<0.01	<0.01	0.09	0.07	0.2	0.037	
BC1	27-May-98	ND	6.4	10	35			35	10	10								0.009	<0.001	<0.05	<0.01	<0.01	<0.02	<0.005	0.03	0.03	
BC1	14-Oct-98	1.4	7.6	80	5	26	80		27	27		0.2	<0.05	<0.01	0.22	<0.001	<0.001	<0.006	<0.001	<0.05	<0.01	<0.01	<0.02	<0.005	0.2	0.026	
BC1	23-Mar-99	1.4	7.3	120	4	26	56	32	29	29	<1	0.25	<0.05	<0.01	0.32	<0.001	<0.001	<0.006	<0.001	<0.05	<0.001	0.007	<0.02	<0.01	0.22	0.035	
BC1	14-Oct-99	1.5	7.5	120	<2	36	81	46	43	43	<1	0.21	0.1	<0.01	0.31	<0.001	<0.001	<0.006	<0.001	<0.05	<0.01	<0.01	<0.02	<0.01	0.44	0.027	
BC1	27-Apr-00	6.5	80	90	<2	19	30	23	15	15	<1	0.25	<0.05	<0.01	1.22	<0.001	<0.001	<0.006	<0.001	<0.05	<0.01	0.006	<0.02	<0.01	0.09	0.044	
BC1	27-Sep-00	1.7	7.4	100	3	26	80	32	46	45	<1	0.3	<0.05	<0.01	0.3	<0.001	<0.001	<0.006	<0.001	<0.05	<0.01	0.015	0.04	<0.01	0.3	0.038	
BC1	30-Apr-01	4.3	7.2	80	<2	18	<1	31	22	14	<1	<0.05	0.52	<0.01	0.3	<0.001	<0.001	<0.006	<0.001	<0.05	<0.01	0.016	<0.02	<0.01	0.3	0.043	
BC1	26-Sep-01	0.3	7.0	100	<2	34	76	42	45	45	<1	0.25	<0.05	<0.01	0.79	<0.001	<0.001	<0.006	<0.001	<0.05	<0.01	<0.01	<0.02	<0.01	0.3	<0.025	
BC1	06-Apr-02	2.3	8.8	84	<2	18	36	22	16	16	<1	0.33	0.05	<0.01	0.18	0.001	<0.001	<0.006	<0.001	<0.05	<0.01	<0.01	0.02	<0.01	0.1	0.035	
BC1	24-Sep-02	2.0	6.7	150	100	<2	30	67	37	31	<1	0.28	<1	<0.01	0.14	0.002	<0.001	<0.006	<0.001	<0.05	<0.01	<0.01	0.04	<0.01	0.04	0.033	
BC1	13-May-03	6.7	6.6	60	<5	22	<1	26	27	15		0.26	<0.05	<0.005	<1	0.00	<0.005	<0.003	<0.001	<0.05	<0.001	0.006	<0.05	<0.02	0.107	0.054	



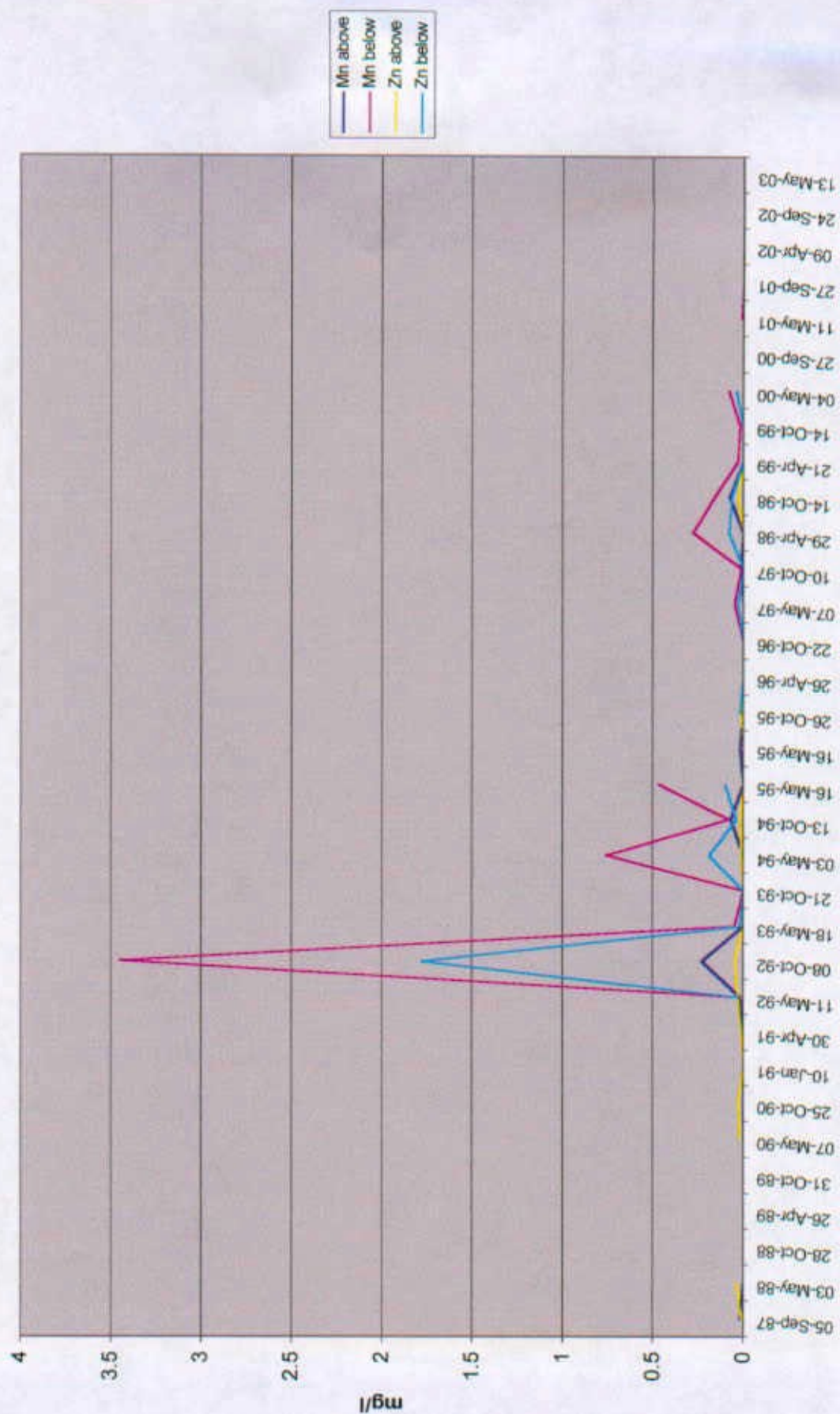
Sunnyvale Gold Corporation-Sunnyvale Mine/Mayflower Mill  
MLR Report

BC 2

Site:

Mean	Std dev	7.2	159	107	12	32	1	67	30	50	0	1.53	0.05	0.000	0.598	0.003	0.000	0.01	0.00	0.19	0.00	0.01	0.18	1.61	0.20	0.80
Station	Sample Date	Field pH	lab pH	TDS(180)	TSS	Alt	Ac	Hard	Bicarb	Sulfate	CO3	NO3/NO2	NH3-N	Cyanide	Fl	dCd	dHg	dPb	dAg	dAu	dCu	dFe	dMn	dSr	dZn	
BC2	01-Jul-86	6.57		71	184																					
BC2	01-Sep-86	7.63		68	4																					
BC2	01-Oct-86	7.02		77	4																					
BC2	28-Oct-86	6.8	181	110	3	33	nd	85	40.0	50.0	0.0	0.14	0.42	0.001	0.30	0.004	nd	0.09	nd	0.20	nd	0.02	0.58	1.08	0.36	
BC2	28-Apr-86	5.46	7.53	101	32	46	7	nd	40	20.0	0.0	0.07	nd	nd	0.53	0.002	nd	nd	nd	0.10	0.04	nd	0.59	0.28		
BC2	30-Oct-89	0.77	7.61	202	49	30	0	82	36.2	252.7	0.0	0.17	<0.01	<0.05	0.46	0.002	nd	nd	4.00	ND	0.02	3.96	0.07	0.16		
BC2	04-May-90	1.65	7.22	240	146	41	15	10	18.6	88.7	0.0	0.89	0.06	<0.05	1.43	0.019	nd	0.04	nd	nd	0.03	nd	9.16	2.56		
BC2	30-Oct-90	2	7.83	130	54	5	14	0	56	16.5	0.0	0.06	0.07	<0.05	2.19	0.001	<0.01	<0.04	<0.01	<0.02	<0.01	<0.05	1.53	0.17		
BC2	30-Apr-91	1.35	7.77	244	142	14	16	0	106	20.1	86.5	0.0	0.17	<0.04	1.67	0.018	<0.01	<0.05	0.20	0.02	0.06	0.44	9.03	0.23		
BC2	25-Sep-91	1.5	7.5	133	102	1	28	0	60	33.6	36.7	0	0.04	<0.01	0.26	<0.02	<0.01	<0.02	<0.01	<0.02	<0.01	<0.05	0.28	0.18		
BC2	01-May-92	8.4	7.2	69	44	2	20	<1	36	23.8	13.6	0	<0.01	<0.01	2.61	<0.02	<0.01	<0.02	<0.01	<0.02	<0.01	<0.05	0.02	0.08		
BC2	09-Nov-92	0.3	7.1	180	124	3	28	78	34.2	53.1	<1	0.16	<0.01	<0.01	0.33	<0.02	<0.01	<0.01	<0.01	<0.02	<0.005	0.46	0.41			
BC2	28-Jul-93	5.3	6.6	74	15	16		56	23	33	0	0.24	0.06	<0.01	0.3	0.003	<0.01	0.005	<0.001	0.1	<0.02	0.02	2.45	<5		
BC2	04-Oct-93	1.1	7.9	195	94	<1	28	<1	35	46	0	0.05	0.09	<0.01	0.31	<0.02	<0.01	<0.05	<0.001	<0.02	<0.001	<0.05	0.88	<5		
BC2	25-Apr-94	2.2	7.4	122	84	10	18	59	22	38	0	0.43	0.11	<0.01	0.31	0.002	<0.01	<0.05	<0.001	0.1	<0.02	0.01	1.38	0.1		
BC2	28-Oct-94	1.94	6.3	98	1	28		61	34	34	0	0.28	ND	<0.05	0.19	<0.02	<0.01	0.24	<0.001	0.2	<0.02	0.008	0.69	0.2		
BC2	27-Apr-95	1.6	6.8	176	13	24		102	29	84	0	0.38	0.13	<0.05	0.73	0.008	<0.01	<0.05	<0.001	0.1	<0.02	0.012	5.13	0.3		
BC2	31-Oct-86	0.4	7.6	185	<2	58		90	43.9	51.5	0	<0.01	0.14	<0.01	0.37	<0.02	<0.01	<0.05	<0.001	<0.02	0.002	0.05	0.27	0.4		
BC2	28-Apr-86	3.8	7.4	90	3	220		52	24.4	39.5	<1	36.5	<0.05	<0.01	0.36	0.003	<0.01	<0.05	<0.001	0.2	<0.01	0.016	1.66	0.01		
BC2	24-Oct-86	2.3	6.9	278	110	3	28	50	34.2	28.8	<1	0.21	<0.05	<0.01	0.21	<0.01	<0.01	<0.05	<0.001	<0.05	<0.01	0.002	<0.025	<0.05		
BC2	16-Apr-97	1.2	8.7	239	168	5	23	105	27.5	90.1	<1	0.41	<0.04	<0.01	0.84	0.007	<0.01	<0.05	<0.001	0.13	<0.01	0.014	4.43	0.33		
BC2	08-Sep-97	2.3	6.3	130	120	<2	28	45	34	33	<1	<0.05	<0.05	<0.01	0.28	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	<0.02	0.22	0.2		
BC2	23-May-98	1.9	6.7	210	130	<2	39	82	48	68	<1	0.4	<0.05	<0.01	0.72	0.003	<0.01	<0.05	<0.01	<0.05	<0.01	0.03	5.05	0.2		
BC2	27-May-98	ND	8.2	37	110	<2	32	71		12		0.23	<0.05	<0.01	0.27	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	0.02	0.28	0.1		
BC2	14-Oct-98	0.8	7.7	160						35			<0.05	<0.01	0.27	<0.01	<0.01	<0.05	<0.01	<0.05	0.04	<0.02	0.186	0.2		
BC2	23-Mar-98	1.2	7.2	180	130	<2	25	69	30	43	<1	0.26	<0.05	<0.01	0.49	0.002	<0.01	0.009	<0.01	0.19	<0.01	0.017	<0.02	1.3		
BC2	14-Oct-99	0.7	7.3	240	150	<2	38	92	46	58	<1	0.21	0.15	<0.01	0.36	0.002	<0.01	<0.05	<0.01	0.07	<0.01	0.001	1.86	0.4		
BC2	27-Apr-00	6.1	6.4	90	100	<2	21	34	25	20	<1	0.23	<0.05	<0.01	0.17	<0.01	<0.01	<0.05	<0.01	0.05	<0.01	0.008	0.63	0.1		
BC2	27-Sep-00	1.3	7.4	100	130	<2	34	81	41	47	<1	0.52	<0.05	<0.01	0.29	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	0.009	0.2	0.3		
BC2	30-Apr-01	2.97	7.1	100	80	<2	18	<1	38	21	<1	<0.05	0.2	<0.01	0.3	<0.01	<0.01	<0.05	<0.01	0.08	<0.01	0.013	0.38	<1		
BC2	26-Sep-01	0.6	7.3	180	120	<2	36	86	44	54	<1	0.08	<0.05	<0.01	1.22	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	0.04	0.16	0.3		
BC2	05-Apr-02	3.4	6.9	90	60	<2	16	41	20	18	<1	0.33	0.06	<0.01	0.22	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	0.02	0.07	0.1		
BC2	24-Sep-02	1.9	7.1	150	100	<2	30	66	37	33	<1	0.27	<1	<0.01	0.19	0.002	<0.01	<0.05	<0.01	0.05	<0.01	0.05	0.17	0.25		
BC2	13-May-03		7.0	81	40	<5	20	<1	36	24	17	0.3	<0.05	<0.05	<1	0.0003	<0.005	<0.03	<0.01	<0.05	<0.005	0.01	0.17	0.114		

# TP #3 Drainage Ditch



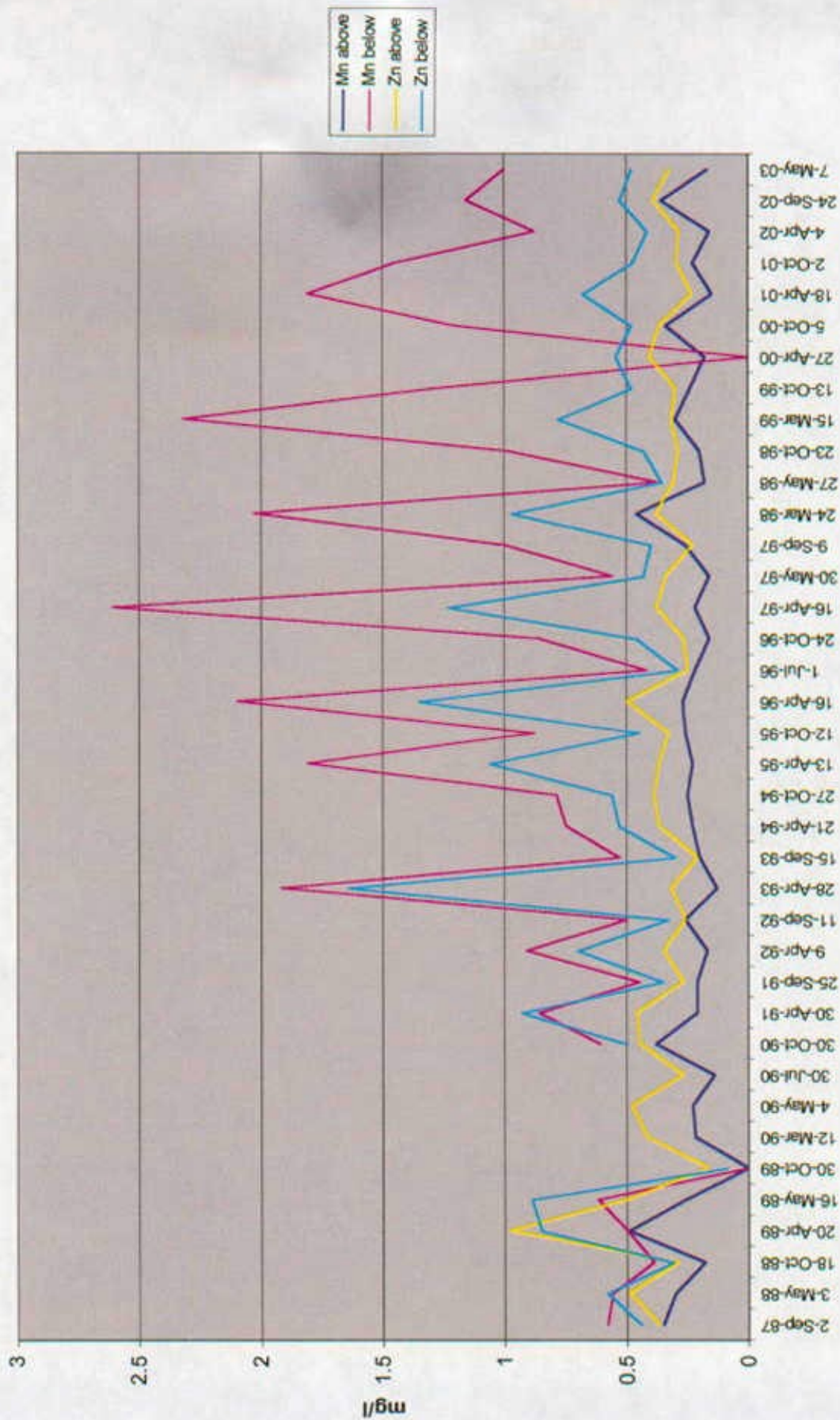
**A-8**

## SCTP32

MILR Report

Mean		Std dev		7.4		232		163		20		39		0		105		47		67		0		0.05		0.06		0.001		0.849		0.001		0.000		0.01		0.00		0.05		0.00		0.03		0.29		0.36		0.13					
		0.4		32		29		40		15		0		17		19				18		0		0.07		0.11		0.004		0.371		0.002		0.000		0.04		0.00		0.08		0.00		0.05		0.70		0.19		0.38					
TDS(180)		labond		Field-H				mg/l		TSS		Ak		Ac		Hard		Bicarb		Sulfate		CO3		NO3&NO2		NH3-N		Cyanide		Fi		dCd		dHg		dPb		mg/l		dAl		dCu		dFe		dMn		dSr		mg/l		dZn		mg/l	
236		7.89				170		21.2		55		nd		114		66				60		0		0.24		0.03		0.31		0.002		nd		nd		nd		0.3		nd		0.08		0.02		0.02		nd		0.54		0.38			
SC1P32		SC1P32		SC1P32		SC1P32		128		171		16		nd		82		19		87		0		0.08		0.15		nd		0.16		0.008		nd		0.02		nd		0.2		nd		0.01		nd		0.18		0.1					
SC1P32		SC1P32		SC1P32		SC1P32		170		44		26		0		113		33.8		82.2		0		<0.04		<0.02		<0.005		0.78		0.0008		nd		nd		nd		nd		nd		nd		0.38		0.47		0.06					
SC1P32		SC1P32		SC1P32		SC1P32		190		20		59		0		128		72		76		0		<0.04		<0.01		ND		0.65		<0.002		<0.001		<0.02		<0.01		<1		<0.05		<0.05		0.38		0.47		0.06					
SC1P32		SC1P32		SC1P32		SC1P32		168		8		41		ND		115		48.4		77.4		0.0		<0.04		ND		<0.01		0.70		<0.002		<0.001		<0.02		<0.01		<1		<0.05		<0.05		0.42		0.03							
SC1P32		SC1P32		SC1P32		SC1P32		230		108		7		<1		130		8.54		127		<0.1		<0.04		<0.01		0.58		0.01		<0.001		<0.03		<0.01		0.20		0.02		0.01		0.24		3.45		0.75		1.78					
SC1P32		SC1P32		SC1P32		SC1P32		114		5		27		75		33		0.1		49		0		0.03		0.1		<0.01		0.54		<0.002		<0.001		<0.005		<0.01		<1		0.06		0.05		<5		0.02							
SC1P32		SC1P32		SC1P32		SC1P32		158		9		54		116		65		0.1		65		0		0.05		<0.01		<0.01		0.55		<0.002		<0.001		<0.005		<0.01		<1		<0.05		<0.05		0.8		<0.1							
SC1P32		SC1P32		SC1P32		SC1P32		204		41		27		123		33		33		97		0		0.24		0.13		<0.02		0.84		<0.002		<0.001		<0.005		<0.01		0.1		<0.02		0.005		<0.05		0.78		0.1		0.19			
SC1P32		SC1P32		SC1P32		SC1P32		162		5		41		100		50		0		60		0		0.13		<0.05		0.37		<0.002		<0.001		0.21		<0.001		0.1		<0.02		0.004		<0.05		0.08		0.5		0.04					
SC1P32		SC1P32		SC1P32		SC1P32		142		5		31		89		37		3		82		0		<0.01		0.48		<0.01		0.85		<0.002		<0.001		<0.005		<0.01		<1		<0.02		0.005		0.05		0.47		0.3		0.1			
SC1P32		SC1P32		SC1P32		SC1P32		138		<2		43		102		52.2		0.1		67		0		0.1		<0.05		<0.01		0.85		<0.001		<0.005		<0.01		<1		<0.02		0.005		0.06		<0.2		0.3		0.02					
SC1P32		SC1P32		SC1P32		SC1P32		150		2		28		9.8		34.2		0.1		70.2		<1		0.08		0.02		0.01		0.86		<0.001		<0.005		<0.01		0.08		<0.01		<0.001		<0.025		0.38		<0.05							
SC1P32		SC1P32		SC1P32		SC1P32		120		2		48		99		58.6		0.1		53.1		<1		0.06		0.12		<0.01		0.44		<0.001		<0.005		<0.01		<0.05		<0.01		<0.003		<0.025		<0.01		<0.38		<0.05					
SC1P32		SC1P32		SC1P32		SC1P32		138		6		32		91		38		58.6		58.6		<1		0.1		<0.05		<0.01		0.59		<0.001		<0.005		<0.01		<0.05		<0.01		0.902		<0.2		0.05		0.27		0.03					
SC1P32		SC1P32		SC1P32		SC1P32		180		<2		83		129		76		80		80		<1		<0.05		<0.05		<0.01		0.64		<0.001		<0.005		<0.01		<0.05		<0.01		<0.02		0.014		0.4		<0.2							
SC1P32		SC1P32		SC1P32		SC1P32		180		12		38		84		43		58		58		<1		<0.05		<0.05		<0.01		0.81		<0.001		<0.005		<0.01		<0.06		<0.01		<0.02		0.28		0.3		0.077							
SC1P32		SC1P32		SC1P32		SC1P32		200		<2		56		120		59		59		59		<1		<0.05		0.13		<0.01		2.23		<0.001		<0.005		<0.01		0.06		<0.01		<0.04		0.16		0.3		0.065							
SC1P32		SC1P32		SC1P32		SC1P32		150		2		38		103		46		60		60		<1		<0.05		<0.06		<0.01		0.87		<0.001		<0.005		<0.01		<0.05		<0.01		0.002		0.3		<0.025									
SC1P32		SC1P32		SC1P32		SC1P32		200		<2		62		109		76		52		52		<1		0.08		0.12		<0.01		0.67		<0.001		<0.005		<0.01		<0.05		<0.01		<0.02		0.03		0.3		<0.05							
SC1P32		SC1P32		SC1P32		SC1P32		160		<2		27		79		32		51		51		<1		<0.05		<0.05		<0.01		0.6		<0.001		<0.005		<0.01		<0.05		<0.01		0.002		0.8		0.08		0.2		0.04					
SC1P32		SC1P32		SC1P32		SC1P32		130		3		24		81		28		51		51		<1		<0.05		<0.05		<0.01		0.5		<0.001		<0.005		<0.01		<0.05		<0.01		0.03		0.01		0.2		<0.25							
SC1P32		SC1P32		SC1P32		SC1P32		170		<2		60		122		73		63		63		<1		>0.05		0.07		<0.01		0.95		<0.001		<0.005		<0.01		<0.05		<0.01		0.4		<0.25											
SC1P32		SC1P32		SC1P32		SC1P32		DRY		DRY		DRY		DRY		DRY		DRY		DRY		DRY		DRY		DRY		DRY		DRY		DRY		DRY		DRY		DRY		DRY		DRY		DRY		DRY									

# ANIMAS RIVER





Mean	Std dev	7.3	271	180	3	31	0	127	38	90	0	0.25	0.17	0.001	0.528	0.001	0.004	0.000	0.00	0.00	0.03	0.00	0.07	0.26	0.47	0.36
		0.5	47	48	4	5	0	22	6	22	0	0.41	0.33	0.004	0.217	0.001	0.005	0.000	0.00	0.00	0.08	0.00	0.13	0.15	0.21	0.11
Station	Sampledate	Qmgd	Fieldph	labband	TSS	AK	mg/L	mg/L	Bicarb	Sulfate	CO3	NO3&NO2	NH3-N	Cyanide	Pi	mg/L	dCu	d16	dPS	dAI	mg/L	dFe	mg/L	dMn	dZn	
AR3.5	01-Jul-88	7.7			180	3	31	0	127	38	90	0	0.25	0.17	0.001	0.528	0.001	0.004	0.000	0.00	0.03	0.00	0.07	0.26	0.47	0.36
AR3.5	01-Aug-88	7.8		113	2																					
AR3.5	01-Sep-88	7.5		117	7																					
AR3.5	01-Oct-88	7.3		148	1																					
AR3.5	02-Sep-87	47.5	233	170	nd	32	nd	105	38	70	0	0.15	0.03	0.001	0.31	0.002	nd	nd	nd	nd	nd	nd	0.35	0.37		
AR3.5	03-May-88	38.4	260	188	3	26	nd	115	31	80	0	0.23	0.03	nd	0.4	nd	nd	nd	nd	nd	nd	0.3	0.48			
AR3.5	19-Oct-88	28.7	270	200	3	34	nd	125	41	90	0	2.55	0.80	nd	0.39	nd	nd	0.03	nd	nd	nd	0.35	0.18	0.29		
AR3.5	20-Apr-89	115.9	218	58	2	19	nd	83	23	70	0	0.31	0.35	nd	0.39	0.008	nd	nd	nd	0.1	nd	0.12	0.48	0.88		
AR3.5	16-May-89	78.0	7.1	187	112	1	27	<1	86	27	58	0	0.31	0.1	<0.05	0.52	0.002	<0.01	<0.01	<0.01	<0.02	0.11	0.26	0.5		
AR3.5	30-Oct-89	17.6	8.0	338	302	2	32	0	138	38.65	108.05	0	0.14	<0.1	<0.05	0.53	0.002	nd	nd	0.4	nd	0.16	nd	0.17		
AR3.5	12-Mar-90	nd	6.2	371	272	6	31	0	168	37.28	136.62	0	0.16	0.189	<0.05	0.528	0.0027	nd	0.005	nd	nd	nd	0.22	0.42		
AR3.5	04-May-90	35.7	8.5	290	186	1	30	0	130	96.1	89.2	0	0.23	0.07	<0.05	0.8	0.0015	nd	nd	nd	nd	nd	0.23	0.48		
AR3.5	30-Jul-90		7.7	230	194	2	23	0	108	28	86	0	0.44	0.06	<0.05	0.52	0.0013	0.0002	<0.01	<1	<0.02	<0.05	0.14	0.27		
AR3.5	24-Sep-90							160																		
AR3.5	30-Oct-90	47.0	8.0	254	136	3	31	0	112	37.8	79.4	0	0.06	0.36	<0.05	1.49	0.0016	<0.01	<0.01	<1	<0.02	<0.05	0.38	0.45		
AR3.5	06-Dec-90	7.7						138																		
AR3.5	11-Dec-90							143																		
AR3.5	15-Jan-91							143																		
AR3.5	24-Jan-91							157																		
AR3.5	12-Mar-91							152																		
AR3.5	30-Apr-91	35.1	6.7	274.0	172	21	32	0	124	38.4	94	0	0.19	<0.4	0.91	0.0007	<0.01	<0.01	<0.01	<1	<0.02	<0.05	0.21	0.41	0.46	
AR3.5	25-Sep-91	16.47	7.82	256	182	<1	41	121	50	86.1	0	<0.4	1.08	<0.1	0.44	<0.02	<0.01	<0.01	<0.01	<1	<0.02	<0.05	0.21	0.4	0.27	
AR3.5	09-Apr-92	24.2	7.8	266	206	1	26	138	31.7	109	0	<0.2	<0.02	0.18	0.44	<0.02	<0.01	<0.01	<0.01	<1	<0.02	<0.05	0.17	0.46	0.35	
AR3.5	09-Apr-92				<2						<1	0.06	<0.2	<0.1	0.39	<0.02	<0.01	<0.01	<0.01	<1	<0.02	<0.05	0.26	0.45	0.26	
AR3.5	11-Sep-92	42.0	7.6	254	186	<1	38	135	45.8	92	<1	<0.1	<0.05	<0.02	0.44	<0.02	<0.01	<0.01	<0.01	<0.1	<0.02	<0.08	0.13	<0.05	0.32	
AR3.5A	12-Feb-93	ND	7.4	264	2	185	<0.1	<0.1	<0.22	<0.1	0.19	0.22	<0.1	0.49	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
AR3.5	26-Apr-93	45.0	7.4	243	150	7	35	110	42	79	0	0.19	0.22	<0.1	0.44	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
AR3.5	27-Jul-93	90.4	7.3																							
AR3.5	15-Sep-93	46.9	6.9	244	158	3	33	<1	110	41	79	0	0.11	0.04	<0.1	0.49	<0.02	<0.01	<0.01	<1	<0.02	0.05	0.2	0.5	0.21	
AR3.5	21-Apr-94	52.0	7.1	223	184	7	29	107	36	80	0	0.44	0.7	<0.1	0.37	<0.02	0.004	<0.01	<0.01	<1	<0.02	0.13	0.23	0.3	0.37	
AR3.5	27-Oct-94	29.0	7.3	271	192	<1	34	118	41	85	0	0.23	<0.05	0.36	<0.02	<0.01	0.004	<0.01	<0.01	<1	<0.02	<0.05	0.25	0.5	0.39	
AR3.5	13-Apr-95	30.3	6.6	268	176	<1	32	133	38	104	0	0.24	0.26	<0.1	0.49	<0.02	0.005	<0.01	<0.01	<1	<0.02	<0.05	0.23	0.5	0.37	
AR3.5	12-Oct-95	37.0	7.5	230	200	<1	32	133	38	87	0	0.02	1.46	<0.1	0.43	<0.02	0.018	<0.01	<0.01	<1	<0.02	0.06	0.26	0.38	0.33	
AR3.5	18-Apr-96	32.5	7.2	289	184	<2	30	127	38.6	95	<1	<0.05	<0.05	<0.1	0.43	<0.01	<0.05	<0.01	<0.01	0.06	<0.01	0.08	0.27	1.3	0.5	
AR3.5	01-Jul-96	ND	6.3														0.008	<0.01	<0.01	<0.05	0.04	0.07	0.22	0.25	0.25	
AR3.5	24-Oct-96	32.2	6.7	210	180	6	32	120	39	88.1	<1	<0.05	<0.05	0.01	0.48	<0.01	0.001	<0.01	<0.01	<0.05	<0.01	0.04	0.16	0.44	0.27	
AR3.5	16-Apr-97	25.5	6.9	300	200	<2	33	143	39.7	111	<1	0.32	<0.05	<0.1	0.61	<0.01	0.002	<0.01	<0.01	<0.05	<0.01	0.07	0.22	0.55	0.38	
AR3.5	30-May-97	ND	6.8														0.009	<0.01	<0.01	0.21	0.05	0.05	0.16	0.34	0.34	
AR3.5	09-Sep-97	47.4	6.4	240	190	<2	36	115	43	71	<1	<0.05	<0.05	0.02	0.47	<0.01	0.01	<0.01	<0.01	<0.05	<0.01	0.19	0.26	0.4	0.23	
AR3.5	24-Mar-98	22.2	6.8	330	230	9	35	146	43	101	<1	0.27	<0.05	<0.1	0.59	0.001	<0.1	<0.01	<0.01	0.11	<0.01	0.18	0.46	0.6	0.38	
AR3.5	27-May-98	ND	6.4					67		34	<1					0.001	<0.01	0.006	<0.01	<0.05	<0.01	0.06	0.18	0.31	0.31	
AR3.5	23-Oct-98	43.0	7.5	250	190	<2	35	119	43	81	<1	0.29	<2	<0.1	0.46	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	0.02	0.2	0.4	0.29	
AR3.5	15-Mar-99	12.8	6.5	320	240	3	36	153	44	118	<1	<0.05	<0.05	<0.1	0.52	<0.01	0.001	<0.01	<0.01	<0.05	<0.01	0.04	0.3	0.6	0.32	
AR3.5	13-Oct-99	42.5	7.3	220	190	<2	40	121	49	81	<1	0.23	0.11	<0.1	0.45	<0.01	0.001	<0.01	<0.01	<0.05	<0.01	0.03	0.24	0.5	0.300	
AR3.5	27-Apr-00	ND	6.6					82	32	53	<1	0.32	<0.05	<0.1	0.3	0.001	0.008	<0.01	<0.01	<0.05	<0.01	0.02	0.18	0.27	0.41	
AR3.5	05-Oct-00	21.0	7.1	290	180	2	19	130	23	100	<1	0.36	<0.05	<0.1	0.7	<0.01	0.002	<0.01	<0.01	<0.05	<0.01	0.05	0.34	0.4	0.368	
AR3.5	18-Apr-01	33.6	6.8	270	180	<2	30	<1	116	38	80	<1	<0.05	0.07	<0.1	0.53	0.001	<0.01	<0.01	<0.05	<0.01	0.03	0.15	0.5	0.234	

Sunnyside Gold Corporation-Sunnyside Mine/Mayflower Mill  
LR Report

AR 3.5

Site:

Mean	7.3	271	180	3	31	0	127	38	90	0	0.25	0.17	0.001	0.528	0.001	0.004	0.000	0.00	0.03	0.00	0.07	0.26	0.47	0.36
Std dev	0.5	47	46	4	5	0	22	6	22	0	0.41	0.33	0.004	0.217	0.001	0.005	0.000	0.00	0.08	0.00	0.13	0.15	0.21	0.13
Station	FieldpH	labcond	TDS(180)	TSS	Alk	Ac	Hard	Bicarb	Sulfate	CO3	NO3&NO2	NH3-N	Cyanide	Fl	dCd	dCu	dHg	dPb	dAg	dAl	dCrT	dMn	dSr	dZn
AR3.5	8.9	420	220	5	34	34	146	42	110	<1	<05	0.24	<01	0.81	<001	<01	<001	<005	<01	<05	<01	0.02	0.23	0.5
AR3.5	7.1	284	160	<2	30	121	37	85	85	<1	0.32	<05	<01	0.44	<001	<01	<001	<005	<01	0.08	<01	0.71	0.16	0.4
AR3.5	7.3	310	210	<2	32	136	39	107	107	<1	0.28	<05	<01	0.49	0.005	<01	<001	<005	<01	0.08	<01	<02	0.36	0.62
AR3.5	6.6	230	150	<5	32	<1	123	39	75	<1	0.24	<05	<005	0.4	0.001	0.009	<005	<003	<001	<05	<05	0.17	0.32	0.325

[illegible]

**East Side of Mayflower Mill**





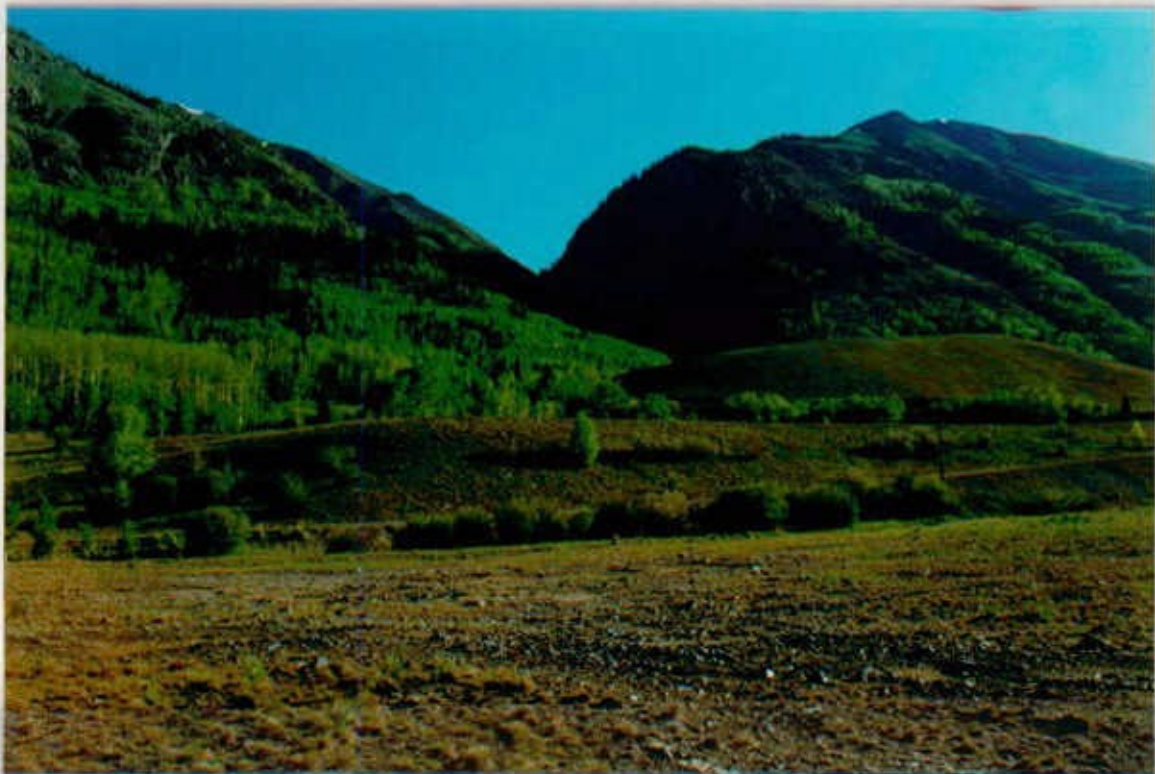




Top of TP#3



South slopes of TP#3 and TP#2





**South slopes of TP#2 and TP#1**



**Boulder Creek between TP#2 and TP#1**





NW slope on TP#2



Top of TP#2





Top of TP#2



East slope of TP#2





West slope of TP#1



South and SW slopes of TP#1





SW slope of TP#1



Top of TP#1







↑ The south face of tailings pond 4, 1993. ↓ The south face of tailings pond 4, 1995.







↑ Tailings ponds 3 and 4, 1992.

↓ Tailings ponds 3 and 4, 1995.







↑ Ditch behind tailings pond 3, 1993.

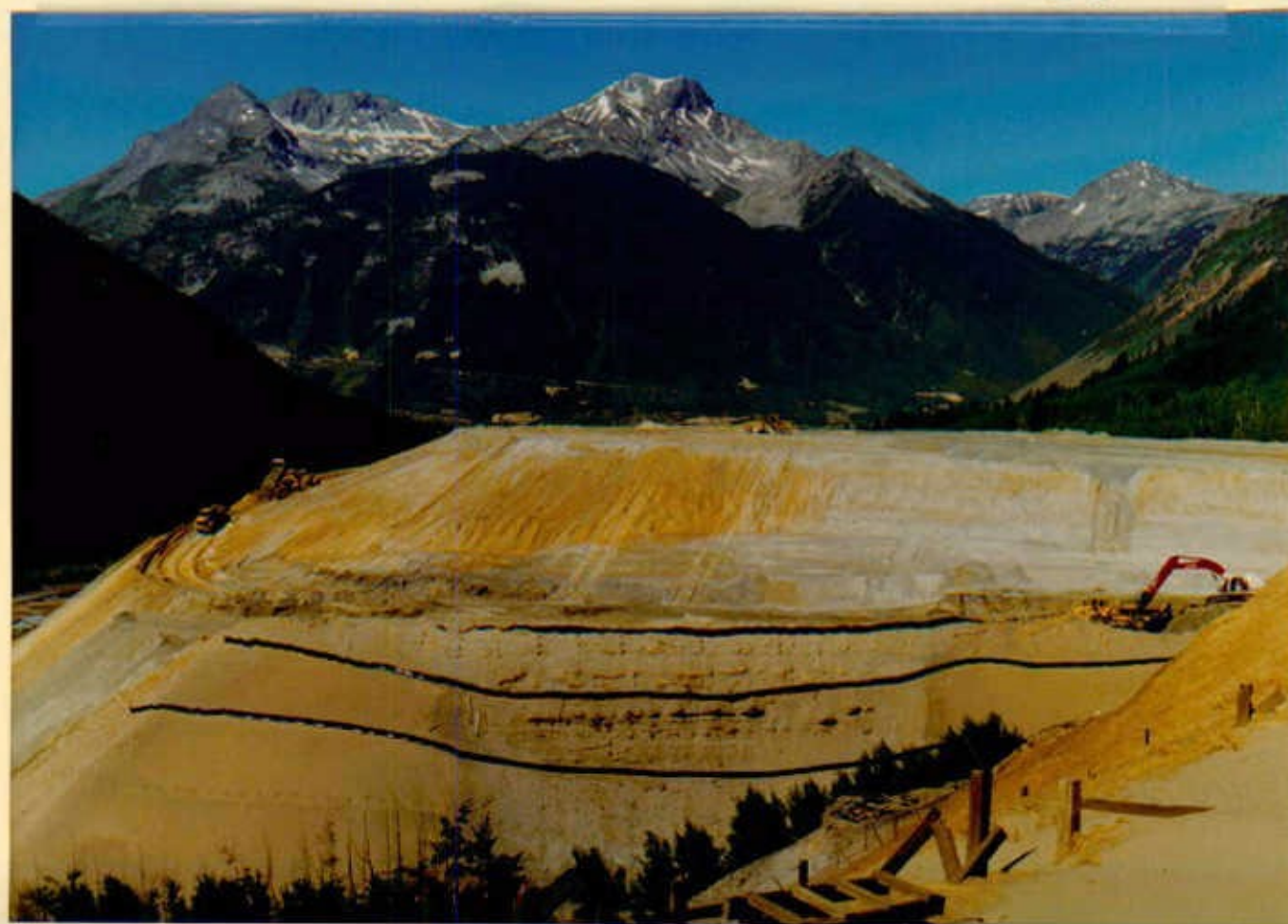
↓ Ditch behind tailings pond 3, 1995.







↑ The east face of tailings pond 2, 1991.      ↓ The east face of tailings pond 2, 1991.







↑ The south face of tailings pond 2, 1991. ↓ The south face of tailings pond 2, 1995.







↑ The east face of tailings pond 2, 1993.      ↓ The east face of tailings pond 2, 1995.







↑ The top of tailings pond 2, 1991.

↓ The top of tailings pond 2, 1995.







↑ The east face of tailings pond 2, 1991.      ↓ The east face of tailings pond 2, 1995.







↑ The east face of tailings pond 2, 1991.

↓ The east face of tailings pond 2, 1991.







↑ The east face of tailings pond 2, 1991.      ↓ The east face of tailings pond 2, 1994.







↑ Tailings ponds 2 & 4 from pond 1, 1993. ↓ Tailings ponds 2 & 4 from pond 1, 1995.







↑ The south face of tailings pond 1, 1992. ↓ The south face of tailings pond 1, 1995.







↑ The east face of tailings pond 1, 1992.      ↓ The east face of tailings pond 1, 1995.







↑ The east face of tailings pond 1, 1992.      ↓ The east face of tailings pond 1, 1995.







↑ The west face of tailings pond 1, 1992. ↓ The west face of tailings pond 1, 1995.







↑The top of tailings pond 1, 1992.

↓The top of tailings pond 1, 1995.







↑ The west face of tailings pond 1, 1992. ↓ The west face of tailings pond 1, 1995.







↑ The south face of tailings pond 1, 1992. ↓ The south face of tailings pond 1, 1995.







↑ The south face of tailings pond 1, 1992. ↓ The south face of tailings pond 1, 1995.







↑Boulder Creek, 1991.

↓Boulder Creek, 1993.







↑Boulder Creek, 1991.

↓Boulder Creek, 1995.







↑Boulder Creek, 1991.

↓Boulder Creek, 1995.





# STATE OF COLORADO

## DIVISION OF MINERALS AND GEOLOGY

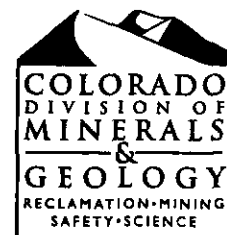
Department of Natural Resources

1313 Sherman St., Room 215

Denver, Colorado 80203

Phone: (303) 866-3567

FAX: (303) 832-8106



December 10, 2003

Mr. Larry Perino  
Sunnyside Gold Corp  
P. O. Box 177  
Silverton, CO 81433

Bill Owens  
Governor

Greg E. Walcher  
Executive Director

Ronald W. Cattany  
Division Director  
Natural Resource Trustee

**Re: Sunnyside Mine, Permit No. M-1977-378, Acreage Reduction Approval, Revision No. AR-2**

Dear Mr. Perino:

On November 24, 2003, the Colorado Division of Minerals and Geology approved your request for release of a portion of the permit area from further reclamation responsibility.

The permit area was reduced to 159.9 acres, through the release of 76.31 acres in this permit action. Because the permit is not totally released, you are still liable for filing annual reports and fees.

In addition, Division decreased the financial warranty required for the site from \$1,250,000.00 to \$500,000.00. This is a reduction of \$750,000.00. Please provide a rider to the current Financial Warranty, or submit a new Financial Warranty reflecting this reduction. If you wish to submit a different type of Financial Warranty, please contact our office for the applicable form.

If you have any questions, please contact me.

Sincerely,

*for*   
Wallace H. Erickson  
Environmental Protection Specialist

cc: Harry Posey, DMG



**COLORADO**

**Department of Public  
Health & Environment**

Dedicated to protecting and improving the health and environment of the people of Colorado

Jim Fowler, VP North America  
Sunnyside Gold Corp c/o Kinross Gold USA Inc  
5075 S Syracuse St Ste 800  
Denver, CO 80237  
[jim.fowler@kinross.com](mailto:jim.fowler@kinross.com)

**MEMORANDUM**

**TO:** Sunnyside Gold Corp c/o Kinross Gold USA Inc

**FROM:** Debbie Jessop, 303-692-3590, [Debbie.Jessop@state.co.us](mailto:Debbie.Jessop@state.co.us)  
Kontessa Rodriguez-Chavez, 303-692-3531, [kontessa.rodriguez-chavez@state.co.us](mailto:kontessa.rodriguez-chavez@state.co.us)  
Joseph Sturgeon, 303-691-4019, [Joseph.Sturgeon@state.co.us](mailto:Joseph.Sturgeon@state.co.us)

**DATE:** 2022-08-02

**RE:** Notice of Termination of Permit to Discharge  
Mayflower Mill  
Permit No: COR040054

As a follow-up to your request for termination of the permit referenced above, this letter is an official notice of termination of Colorado Discharge Permit Number COR040054. The Division has reviewed the information provided and has determined that eligibility requirements for permit termination have been met. This determination is based on the information provided in the Termination Application, and, as applicable, other information available to the Division. The Division has not verified all of the information contained in your application and has relied upon your signed certification to determine that the information is true, accurate, and complete.

This permit termination has been issued on 2022-08-02. The effective date of the termination will be **07/01/2022**. You must complete and submit any reports required by the permit, such as discharge monitoring reports and annual reports, for full or partial monitoring/reporting periods prior to the termination effective date.

Should you need discharge authorization in the future, you will have to obtain new permit coverage.





**COLORADO**

**Department of Public  
Health & Environment**

Dedicated to protecting and improving the health and environment of the people of Colorado

Jim Fowler, VP North America  
Sunnyside Gold Corp c/o Kinross Gold USA Inc  
5075 S Syracuse St Ste 800  
Denver, CO 80237  
jim.fowler@kinross.com

**MEMORANDUM**

**TO:** Sunnyside Gold Corp c/o Kinross Gold USA Inc

**FROM:** Debbie Jessop, 303-692-3590, [Debbie.Jessop@state.co.us](mailto:Debbie.Jessop@state.co.us)  
Kontessa Rodriguez-Chavez, 303-692-3531, [kontessa.rodriguez-chavez@state.co.us](mailto:kontessa.rodriguez-chavez@state.co.us)  
Joseph Sturgeon, 303-691-4019, [Joseph.Sturgeon@state.co.us](mailto:Joseph.Sturgeon@state.co.us)

**DATE:** 2022-08-02

**RE:** Notice of Termination of Permit to Discharge  
Terry Tunnel  
Permit No: COR040058

As a follow-up to your request for termination of the permit referenced above, this letter is an official notice of termination of Colorado Discharge Permit Number COR040058. The Division has reviewed the information provided and has determined that eligibility requirements for permit termination have been met. This determination is based on the information provided in the Termination Application, and, as applicable, other information available to the Division. The Division has not verified all of the information contained in your application and has relied upon your signed certification to determine that the information is true, accurate, and complete.

This permit termination has been issued on 2022-08-02. The effective date of the termination will be **07/01/2022**. You must complete and submit any reports required by the permit, such as discharge monitoring reports and annual reports, for full or partial monitoring/reporting periods prior to the termination effective date.

Should you need discharge authorization in the future, you will have to obtain new permit coverage.





**COLORADO**

**Department of Public  
Health & Environment**

Dedicated to protecting and improving the health and environment of the people of Colorado

,  
Sunnyside Gold Corp c/o Kinross Gold USA Inc

,

**MEMORANDUM**

**TO:** Sunnyside Gold Corp c/o Kinross Gold USA Inc

**FROM:** Debbie Jessop, 303-692-3590, [Debbie.Jessop@state.co.us](mailto:Debbie.Jessop@state.co.us)  
Kontessa Rodriguez-Chavez, 303-692-3531, [kontessa.rodriguez-chavez@state.co.us](mailto:kontessa.rodriguez-chavez@state.co.us)  
Joseph Sturgeon, 303-691-4019, [Joseph.Sturgeon@state.co.us](mailto:Joseph.Sturgeon@state.co.us)

**DATE:** 2022-08-02

**RE:** Notice of Termination of Permit to Discharge  
Sunnyside Basin  
Permit No: COR040060

As a follow-up to your request for termination of the permit referenced above, this letter is an official notice of termination of Colorado Discharge Permit Number cor040060. The Division has reviewed the information provided and has determined that eligibility requirements for permit termination have been met. This determination is based on the information provided in the Termination Application, and, as applicable, other information available to the Division. The Division has not verified all of the information contained in your application and has relied upon your signed certification to determine that the information is true, accurate, and complete.

This permit termination has been issued on 2022-08-02. The effective date of the termination will be **7-1-2022**. You must complete and submit any reports required by the permit, such as discharge monitoring reports and annual reports, for full or partial monitoring/reporting periods prior to the termination effective date.

Should you need discharge authorization in the future, you will have to obtain new permit coverage.







**COLORADO**

**Division of Reclamation,  
Mining and Safety**

Department of Natural Resources

1313 Sherman Street, Room 215  
Denver, CO 80203

July 24, 2018

Larry Perino  
Sunnyside Gold Corp  
P.O. Box 177  
Silverton, CO 81433

**Re: Sunnyside Gold Mine, Permit No. M-1977-378, Acreage Reduction Approval, AR-5**

Dear Mr. Perino:

On July 24, 2018, the Division approved your request for release of a portion of the permit area for completion of reclamation.

In the processing of this revision staff discovered an error in our internal records. The Permit Acreage was incorrectly listed at 148.93 acres and the Affected Acreage at 243.7 acres. Prior to this revision the Permit Acreage should have been **159.49** acres and the Affected Acreage should have been **131.26** acres. These values were corrected.

The permit area was reduced to 85.87 acres, through the release of 73.62 acres at the Sunnyside Basin/ Lake Emma and the Terry Tunnel areas. The resulting acreage of Permit M-1977-378 is located at the Mayflower Tailings Pond #4 and the American Tunnel area now totaling **85.87 Permitted Acres** and **77.46 Affected Acres**. Because the permit is not totally released, you are still liable for filing annual reports and fees.

If you have any questions, please contact me at the Division's Grand Junction Field Office, by phone at (970)-243-6368 or by email at [lucas.west@state.co.us](mailto:lucas.west@state.co.us).

Sincerely,

**Lucas J. West**  
Environmental Protection Specialist  
Division of Reclamation, Mining and Safety

Cc: Wally Erickson, Senior Environmental Protection Specialist





## COLORADO

### Division of Reclamation, Mining and Safety

Department of Natural Resources

1313 Sherman St. Room 215  
Denver, CO 80203

October 21, 2021

Pat Maley  
Sunnyside Gold Corp  
5075 South Syracuse Street  
Denver, CO 80237

**Re: Sunnyside Gold Mine, Permit No. M-1977-378, Financial and Performance Warranty  
Release Approval, Revision No. SL-1**

Mr. Maley:

On August 30, 2021 the Division of Reclamation, Mining and Safety (Division) received your request for full and final release of the entire permit area and the associated financial warranty. Based on the observations made during the June 6, 2021 Inspection, Division Staff has determined that the Operator has completed final reclamation in accordance with the Act, Rules and Regulations and the approved Reclamation Plan. Therefore on October 20, 2021, the Division has **approved** your release request and you are hereby released of any further reclamation liability with the Division.

According to Rule 1.4.11(1)(b), the Division must wait 30 days from the date of this letter before releasing the Financial Warranty, in order to address any comments or objections to this decision. If you have any questions regarding the Financial Warranty release procedure please contact Sara Stevenson-Benn at 303-866-3567 Ext. 8148, for all other questions please feel free to contact me at the Division's Grand Junction Field Office, by phone at 303-866-3567 Ext. 8187 or by email at [lucas.west@state.co.us](mailto:lucas.west@state.co.us).

Sincerely,

Lucas J. West  
Environmental Protection Specialist

cc: Travis Marshall, Senior Environmental Protection Specialist  
Russ Means, Active Mines Program Director, Minerals  
Jeff Fugate, DRMS AGO Counsel  
Sara M. Stevenson-Benn, Division of Reclamation, Mining and Safety



Colorado Department of Public Health & Environment  
Water Quality Control Division  
WQCD-PE-B2  
4300 Cherry Creek Drive South  
Denver, Colorado 80222-1530

**FOR AGENCY USE ONLY**

rec.			
eff			
	Year	Month	Day

**Inactivation Notice for Mining Stormwater Discharge General Permit Certification**

Certification Number: COR-040061

Taxpayer EIN:98-0071882

Permittee (Company) Name: Sunnyside Gold Corporation

Permittee Address: P.O.Box 177  
Silverton, Colorado 81433

Phone No.(970)387-5533

Mine/Facility Name: Gold Prince Mine

Mining Site Address/Location: Protracted SE1/4, S11, T42N, R7W N.M.P.M.

Latitude: 37° 54' 30"

Longitude: 107° 35' 45"

County: San Juan

Receiving Water: Placer Gulch, Tributary to  
W.Fork Animas River

Reason/justification for inactivation, and description of final site stabilization.

Ownership was transferred to Board of County Commissioners, San Juan County (copy of deed attached). A permit transfer is not applicable since San Juan County is currently exempt from Stormwater permit requirements.

A remediation plan was submitted to CDPHE (submittal letter attached). This plan was implemented, certified complete by Sunnyside Gold Corporation, inspected by DMG for compliance with the work plan and MLR Standards (inspection report attached) and accepted by CDPHE as completed (letter attached).

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (18 U.S.C.1001 and 33 U.S.C. 1319).



Signature of Permit Applicant (Legally Responsible Party)

11-08-01

Date Signed

Larry Perino

Reclamation Manager

Name(printed)

Title

# STATE OF COLORADO

Bill Owens, Governor  
Jane E. Norton, Executive Director

*Dedicated to protecting and improving the health and environment of the people of Colorado*

4300 Cherry Creek Dr. S.  
Denver, Colorado 80246-1530  
Phone (303) 692-2000  
TDD Line (303) 691-7700  
Located in Glendale, Colorado

Laboratory and Radiation Services Division  
8100 Lowry Blvd.  
Denver, Colorado 80230-6928  
(303) 692-3090

<http://www.cdphe.state.co.us>



Colorado Department  
of Public Health  
and Environment

April 25, 2001

Peter H. Cheesbrough, Vice President  
Sunnyside Gold Corporation  
P. O. Box 177  
Silverton, CO 81433-

**RE: Inactivation – Stormwater Discharge Permit**  
**Certification No: COR-040057**  
**Ransom--White Star Tunnel**  
**San Juan County**

**Local Contact: Larry Perino, Supt. Technical Serv**  
**970/387-5533**

Dear Mr. Cheesbrough:

This office has reviewed your request for terminating above-referenced permit. It is our opinion that this site does not require a stormwater discharge permit at this time.

You have certified that your site has been stabilized and your fees have been paid. Your permit has been given an inactive status effective on February 13, 2001.

From this process a refund or additional fees may result and if so, you should receive notification within the next 30 days. If you have any questions about permit coverage or billing, please contact me at (303) 692-3599.

Sincerely,

Darlene Casey  
Administrative Assistant  
Water Quality Protection Section  
WATER QUALITY CONTROL DIVISION

XC: File

/dc



# STATE OF COLORADO

Bill Owens, Governor  
Jane E. Norton, Executive Director

*Dedicated to protecting and improving the health and environment of the people of Colorado*

4300 Cherry Creek Dr. S.  
Denver, Colorado 80246-1530  
Phone (303) 692-2000  
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8100 Lowry Blvd.  
Denver, Colorado 80230-6928  
(303) 692-3090

<http://www.cdphe.state.co.us>



Colorado Department  
of Public Health  
and Environment

March 11, 2002

Lois-Ann L. Brodrick, V.P. / Secretary  
Sunnyside Gold Corporation  
P. O. Box 177  
Silverton, CO 81433-

**RE: Inactivation – Stormwater Discharge Permit**

**Certification No: COR-040061**  
**Gold Prince Mine**  
**San Juan County**

**Local Contact: Larry Perino, Reclamation Manager**  
**970/387-5533**

Dear Mr. Brodrick:

This office has reviewed your request for terminating above-referenced permit. It is our opinion that this site does not require a stormwater discharge permit at this time.

You have certified that the final reclamation has been completed and your fees have been paid. Your permit has been given an inactive status effective on February 10, 2002.

From this process a refund or additional fees may result and if so, you should receive notification within the next 30 days. If you have any questions about permit coverage please contact me at (303) 692-3556. Any questions about billing please call Misty Grange at (303) 692-3534.

Sincerely,

Nina Coronado  
Administrative Assistant  
Water Quality Protection Section  
WATER QUALITY CONTROL DIVISION

xc: Permit File  
Fee File

/nc



**SUNNYSIDE GOLD CORPORATION**  
**AN ECHO BAY COMPANY**

P.O. Box 177 • Silverton, CO 81433  
Phone (970) 387-5533 • Fax (970) 387-5310

November 13, 2000

Ms. Kathy Dolan  
Colorado Department of Public Health and Environment  
Water Quality Control Division  
Stormwater Unit  
WQCD-PE-B2  
4300 Cherry Creek Drive South  
Denver, Colorado 80222-1530

RE: Stormwater Permit Inactivation  
Certification No. COR-040057, Ransom-White Star Tunnel, San Juan County

Dear Ms. Dolan:

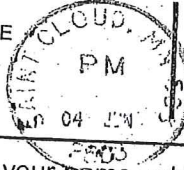
Attached is an inactivation notice for Stormwater Permit COR-040057, Ransom-White Star Tunnel, San Juan County. This site is a historically inactive site owned by Sunnyside Gold Corporation (SGC). SGC completed site reclamation early in the program (1993) as implementation of a SWMP and believes the reclamation work has been successful and the site is eligible for permit inactivation.

Please notify me if WQCD does not agree or if the attached submittal is not adequate for permit inactivation.

Sincerely,

Larry Perino  
Reclamation Manager

UNITED STATES POSTAL SERVICE

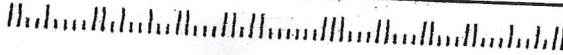


First-Class Mail  
Postage & Fees Paid  
USPS  
Permit No. G-10

• Sender: Please print your name, address, and ZIP+4 in this box •

SUNNYSIDE GOLD CORPORATION  
AN ECHO BAY COMPANY -  
PO BOX 177  
SILVERTON CO 81433

4658/0177



7000 0600 0023 3769 4658

U.S. Postal Service  
**CERTIFIED MAIL RECEIPT**  
(Domestic Mail Only; No Insurance Coverage Provided)

Article Sent To:

Postage	\$ 0.55
Certified Fee	1.40
Return Receipt Fee (Endorsement Required)	1.25
Restricted Delivery Fee (Endorsement Required)	

Total Postage & Fees \$ 3.20

Name (Please Print Clearly) (to be completed by mailer)

CDPHE-WOOD Stormwater Unit  
PO Box 177  
4300 Cherry Creek Drive South  
Denver CO 80222-1530  
City, State, ZIP+4  
PS Form 3800, July 1999 See Reverse for Instructions



Is your RETURN ADDRESS completed on the reverse side?

**SENDER:**

- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

3. Article Addressed to:

CDPHE-WOOD

Stormwater Unit

WQCD-PE-B2

4300 Cherry Creek Drive South  
Denver, CO 80222-1530

5. Received By: (Print Name) Joe R. Trevizo

Dept. of Health

6. Signature: (Addressee or Agent)

X

PS Form 3811, December 1994

I also wish to receive the following services (for an extra fee):  
1. ☐ Addressee's Address  
2. ☐ Restricted Delivery  
Consult postmaster for fee.

4a. Article Number

7000 0600 0023 3769 4658

4b. Service Type

- ☐ Registered
- ☐ Express Mail
- ☐ Return Receipt for Merchandise
- ☐ COD
- ☒ Certified
- ☐ Insured

8. Addressee's Address (Only if requested and fee is paid)

X

Thank you for using Return Receipt Service.

102595-98-B-0229

Domestic Return Receipt

Colorado Department of Public Health & Environment  
Water Quality Control Division  
WQCD-PE-B2  
4300 Cherry Creek Drive South  
Denver, Colorado 80222-1530

FOR AGENCY USE ONLY			
rec			
eff			
	Year	Month	Day

**INACTIVATION NOTICE FOR  
MINING STORMWATER DISCHARGE GENERAL PERMIT CERTIFICATION**

Please print or type. Form must be filled out completely.

Certification Number: **COR-04** 0057 Taxpayer ID or EIN 98-0071882  
-OR- **COG-50** \_\_\_\_\_

Permittee (Company) Name: Sunnyside Gold Corporation

Permittee Address: P.O.Box 177  
Silverton, CO 81433  
Phone No. ( 970 ) 387-5533

Mine/Facility Name: Ransom-White Star Tunnel

Mining Site Address/Location: Protracted SW1/4 S19 T42NR6W N.M.P.M.  
Latitude 37°53'00" Longitude 107°34'15"

County: San Juan Receiving Waters: Eureka Creek, Tributary to S.Fork of

the Animas River  
Reason/justification for inactivation, and description of final site stabilization. (Attach any supporting documentation, such as proof of Mined Land Reclamation Board bond release): \_\_\_\_\_

ATTACHED

I certify under penalty of law that by the date of my signature below, all disturbed soils at the identified mining site have been finally stabilized; all temporary erosion and sediment control measures have been removed; all mining and equipment maintenance waste have been disposed of properly; and all elements of the Stormwater Management Plan have been completed.

I understand that by submitting this notice of inactivation, I am no longer authorized to discharge stormwater associated with mining activity by the general permit. I understand that discharging pollutants in stormwater associated with mining activities to the waters of the State of Colorado, where such discharges are not authorized by a CDPS permit, is unlawful under the Colorado Water Quality Control Act and the Clean Water Act.

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (See 18 U.S.C 1001 and 33 U.S.C. 1319.)

Larry Perino  
Signature of Permit Applicant (Legally Responsible Party)

11/13/2000

Date Signed

Larry Perino

Reclamation Manager

Name (printed)

Title



**Ransom-White Star Tunnel  
Justification for Inactivation  
Certification No. COR-040057**

Sunnyside Gold Corporation (SGC) implemented a SWMP that consisted of site grading, capping mine waste and planting in 1993. Additional seeding was carried out in 1994 and 1995 to establish a vegetative cover to minimize the potential for erosion.

Since 1995, SGC has monitored the site for signs of erosion or other instability and establishment of site vegetation. No signs of erosion or instability have been found. SGC believes the vegetation established (picture attached) and lack of erosion problems for this period of time justifies inactivation of the Stormwater Permit.

## Appendix L

### Qualifications



## Steven Hoffman, P.G.

### PROGRAM MANAGER

#### Summary Of Relevant Qualifications

Mr. Hoffman has over 30 years of experience in environmental consulting, public lands management, project management, construction management, and business administration. His extensive background of environmental project management experience has included sites for major oil companies, municipalities, insurance companies, product manufacturers, agriculture sectors, and single-site issues. Mr. Hoffman is knowledgeable in geology, hydrogeology, hydrology, river mechanics, mined-land reclamation, environmental studies, surface and groundwater contaminant assessment and remediation, ASTM ESA's, risk-assessment evaluations, and water right investigations.

Mr. Hoffman's experience includes:

#### Previous Project Experience

Mr. Hoffman's portfolio of previous work includes consulting, project and program management, health and safety plan development, and compliance. He has worked extensively with the oil and gas industry, as well as with other public and private entities across the United States. His accomplishments include the following:

- Managed and performed the investigation, monitoring, and remediation of over 500 retail petroleum sites throughout the western US.
- Provided risk management analysis of various environmental options for compliance and closure with the regulatory agency and affected stakeholders.
- Phase I and II environmental site assessments in accordance with ASTM standards that included the evaluation of petroleum hydrocarbons, chlorinated solvents, coal-based fill, and other potential contaminants of concern in the soil, groundwater, soil gas, and indoor building air.
- Developed remedial system designs and implemented installation, operation, and monitoring of contaminated properties.
- Prepared project site health and safety plans, job safety analysis documents, and served as the project on-site health and safety officer.
- Developed site closure assessment for regulatory closures.
- Developed Environmental Management Plan and Operating System for commercial feeding operations that was based upon ISO Standards for the successful management of all commercial material entering and leaving the facility.
- Litigation support services to environmental attorneys.

#### YEARS OF EXPERIENCE

*Overall: 30+  
Iron Woman: -*

#### EDUCATION AND CERTIFICATIONS

B.A., Geology, University of  
Northern Colorado, 1985

Licensed Geologist:  
Wyoming, PG-#699

Certifications:  
OSHA HAZWOPER  
OSHA 8-HOUR Refresher  
DOT HAZMAT Training



## Rochelle (Shelly) Hoover, P.E.

### DIRECTOR OF ENVIRONMENTAL COMPLIANCE

#### Summary Of Relevant Qualifications

Ms. Hoover has over 30 years of experience in environmental work. She has held leadership roles in major engineering firms, successfully leading contract management, regulatory compliance, and environmental engineering. Ms. Hoover previously served as the project/ program manager for the Colorado Department of Transportation (CDOT) emergency spill, hazard waste, and abandoned underground storage tank remediation contracts. She also has extensive experience in the investigation, remediation, and closure of contaminated sites, having served as a client representative and consultant.

Ms. Hoover has completed private and public sector projects on schedule and under budget. Her project focus has been on petroleum refineries and pipelines, natural gas processing facilities, UST facilities, materials testing laboratories, DOC roadway and maintenance facilities, dry cleaners, former landfills, and industrial manufacturing facilities. She has completed numerous ASTM compliant environmental site assessments and studies.

Ms. Hoover is also experienced in the classification and identification of environmental health and safety incidents, determining root causes, and implementing comprehensive safety procedures to prevent near-misses and injuries including Job Hazard Analysis (JHA). She has knowledge of Occupational Safety and Health Administration (OSHA) health and safety regulations regarding hazardous waste sites and general construction site operations.

Ms. Hoover's areas of expertise include:

- Client/Stakeholder, Program, and Project Management
- Investigation, remediation, and closure of a variety of contaminated sites, including former landfills, petroleum refineries and pipelines, natural gas processing facilities, CDOT roadway and maintenance facilities, dry cleaners, USTs, and industrial sites
- Engineering feasibility studies
- ASTM compliant Environmental Site Assessments and studies.
- Engineering design and construction oversight of vapor mitigation systems for residential and commercial facilities
- Conversant with all OSHA health and safety regulations regarding hazardous waste sites and general construction site operations

**YEARS OF EXPERIENCE**  
*Overall: 30+  
Iron Woman: 6 months*

#### **EDUCATION AND CERTIFICATIONS**

Bachelor of Science, Chemical and  
Petroleum Refining Engineering,  
Colorado School of Mines, 1991  
Colorado Professional Engineer –  
License #44284  
OSHA 40-Hour Hazardous Waste  
Operations and Emergency  
Response (HAZWOPER) Training  
OSHA 8-Hour HAZWOPER  
Refresher Training, Current  
Red Cross CPR/First Aid