

November 2, 2021

Cameron Adams  
949-424-4780  
[cka0405@gmail.com](mailto:cka0405@gmail.com)

PN: 57070GH

Subject: Observations of Debris Flow Potential  
Adams Cabin - Ruby-Tornado Claim  
Ophir Pass Road, San Juan County, Colorado

Dear Mr. Adams:

As requested, a representative of Trautner Geotech performed a site reconnaissance of the property and adjacent slopes to determine the potential presence of a debris flow hazard on the site.

The project site is located on Ophir Pass Road (FS Road 679) approximately 2 miles west of the intersection with US Highway 550. The site is located at the Ruby-Tornado Claim on the south side of Ophir Pass Road. The project site location is shown below.



Figure 1: Site Location Schematic. Adapted from Google Maps.

We understand San Juan County has requested an analysis of the potential for debris flow to impact the proposed building site. Mud flows and debris flows initiate when soils become saturated and begin to flow down slope, often carrying rocks and boulders within a matrix of mud and water in a concentrated drainage feature. Debris fans are areas where debris flows or mud flows deposit material that spreads out in a fan-like shape at the bottom of a drainage feature.



gullies. We understand the proposed building site will be located east of a drainage feature that originates from a collapsed mine adit above the building site, just below Ophir Pass Road. A site schematic showing the adit, drainage and proposed building site is shown below.

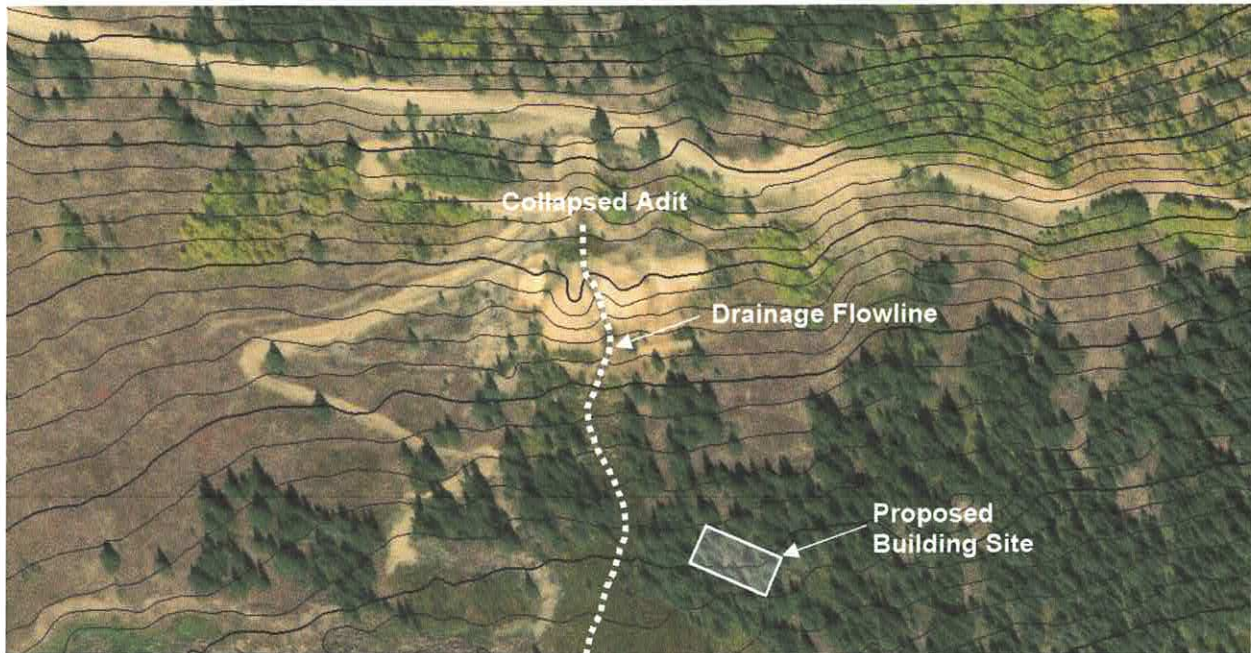


Figure 2: Site Schematic. Adapted from USGS 3DEP-DEM viewer application (5 meter contour interval).

We performed a site reconnaissance of the property on October 5, 2021 to determine if a debris flow hazard exists at the proposed building site. Typical debris flow scenarios originate from natural drainage pathways that often have substantial drainage basin areas and extents in which material may be collected that can cause channel bulking and overflow to surrounding areas. The total length of the channel from the adit to the building site is roughly 500 feet, which is considered a minimal distance and much less of a drainage area that is typically considered for a debris flow hazard. The flow from the adit is also minimal and it not likely greatly affected by large precipitation events that typically initiate debris flow conditions. As noted on the site schematic above, the building site is also located east and slightly uphill of the drainage feature.

Based on our site observations the project building site does not appear to be in an active channelized debris flow hazard area. However, debris flow channel activity is an active process and can change relatively quickly based on changing conditions within the drainage basin. Fire activity is often a catalyst for increased debris flow activity and potential for channel bulking which can readily redirect the flow away from the current pathway to a less desirable location. Proper drainage should be maintained around the proposed structure to limit the potential for impacts of minor flows that may originate from the slope above the site.

Our comments above are based on our limited site observations and experience in the area. We make no warranty as to these comments, either expressed or implied. These comments should not be considered a comprehensive analysis of the debris flow potential at the site. If a detailed debris flow analysis is required, a specialist in this field should be consulted.

Project No. 57070GH  
November 3, 2021  
Page 3 of 3

Please contact us if you have any questions or if we can be of additional service.

Respectfully,  
TRAUTNER GEOTECH



Jason A. Deem, P.G.  
Engineering Geologist







## Flood Hazard

No portion of the property improvements are in a flood hazard area. Reference the images below which were taken from the Colorado Hazard Mapping and Risk Portal. The first image is a wide view and the second a closer view of the site. Note the selection box on the side of the image is the same for both images. A red "X" marks the build site on each image. A site plan was not superimposed as it was deemed unnecessary given the lack of hazard in the vicinity.





Data M...

Layers Documents

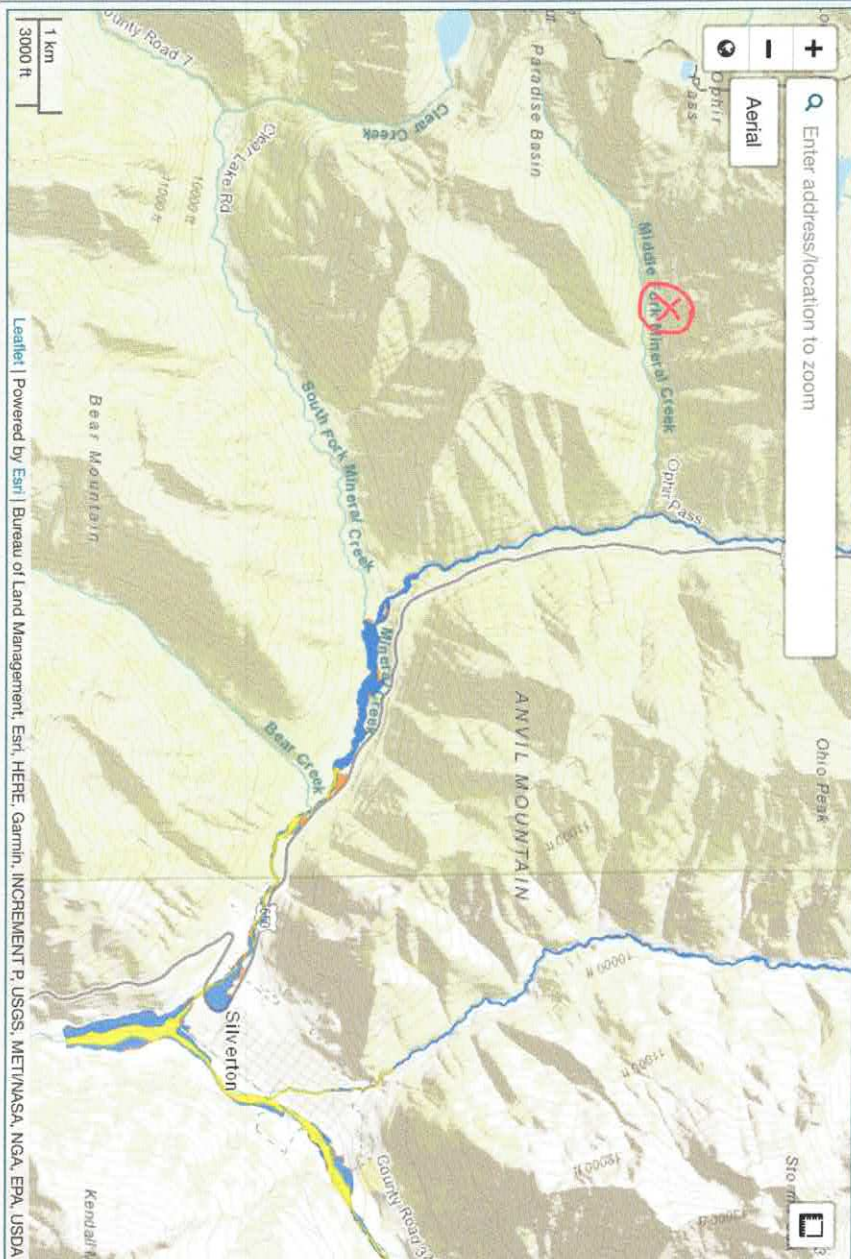
Survey Locations

- Preliminary Floodplains
  - Regulatory Floodway
  - Administrative Floodway
  - AE (1% Annual Chance, 100 Year
  - AO (1% Annual Chance, 100 Year
  - AH (1% Annual Chance, 100 Year
  - 1% Depth < 1 ft
  - X (0.2% Annual Chance, 500 Year
  - Reduced Risk Due to Levee

1% Depth Grids  
Shows the anticipated depth of flooding during a 1% event

Preliminary 1% Water Surface Elevation Grids (WSEL)  
Calculated water surface for a 1% event

Preliminary % Annual Chance  
Chance of flooding in any given year







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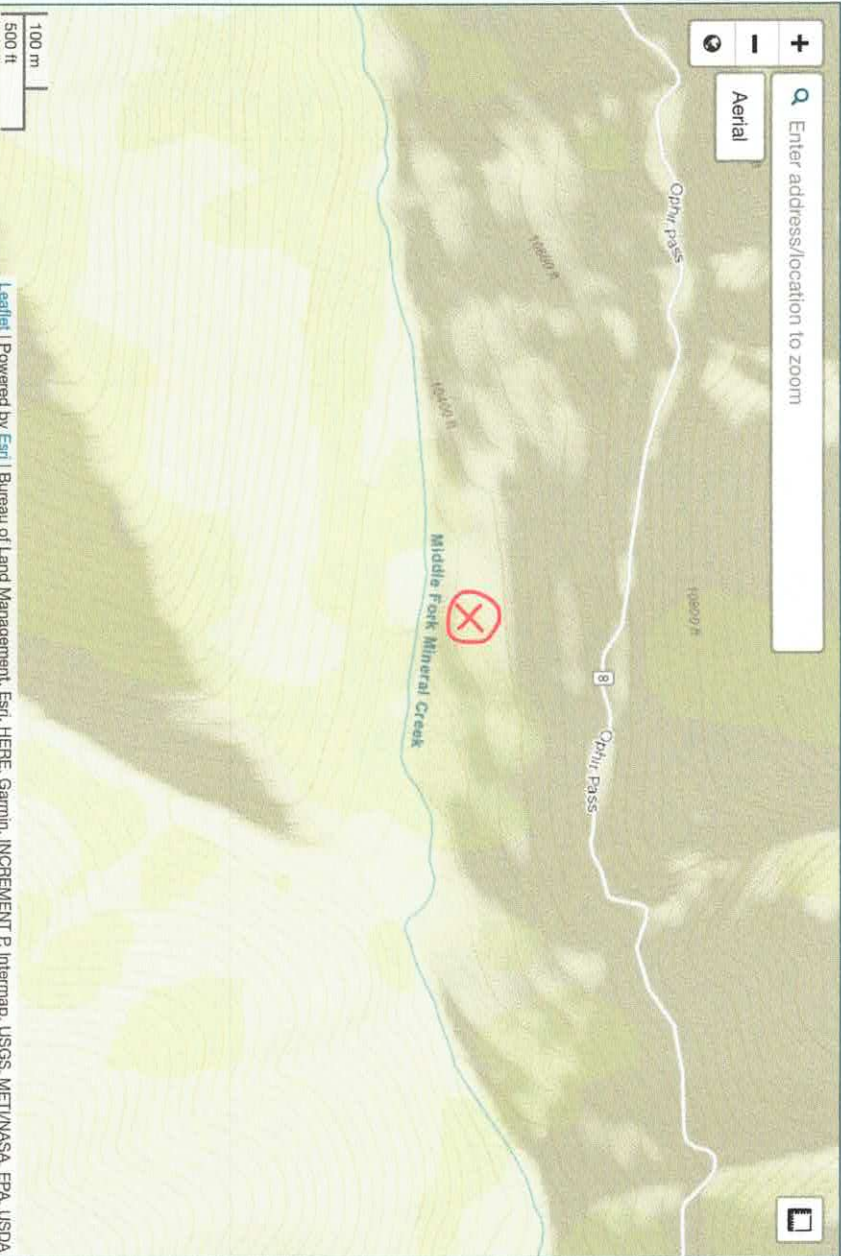
Shows the anticipated depth of flooding during a 1% event

Preliminary 1% Water Surface Elevation Grids (WSEL)

Calculated water surface for a 1% event

Preliminary % Annual Chance

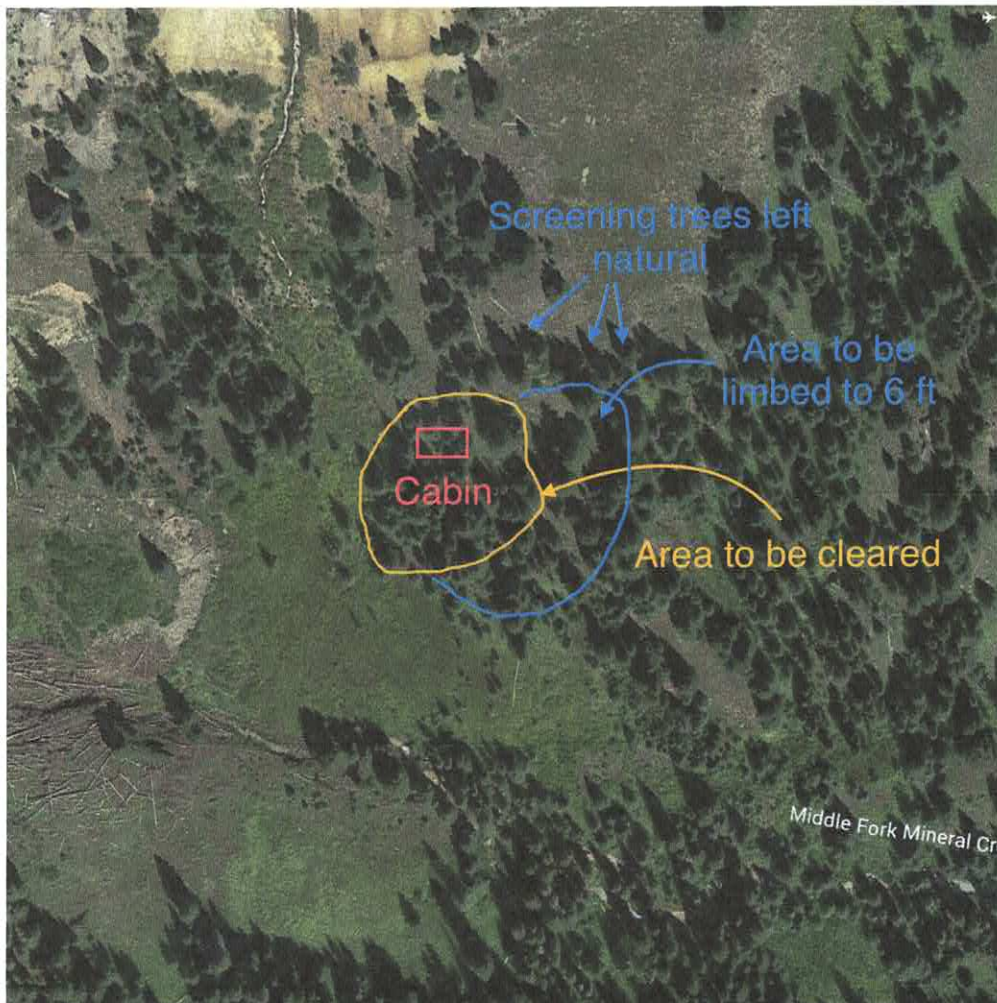
Chance of flooding in any given year





## Wildfire Hazard

The proposed cabin will be in the forest and is therefore at risk of wildfire loss. Mitigation measures will be taken as described in the project narrative to protect the structure and the surrounding forest. Insurability of the structure is also an issue and has thus far presented the most stringent requirements. Below is an satellite image indicating the cleared area around the proposed structure.



Clearing plan

## Section 6: Other regulatory approvals

1. CDPHE Letter
2. USACE PCN Approval
3. SJBPH Septic Permit
4. SWWCD Notice of Intent



# CDPHE Letter



**COLORADO**

**Hazardous Materials  
& Waste Management Division**

Department of Public Health & Environment

Dedicated to protecting and improving the health and environment of the people of Colorado

October 5, 2021

Cameron Adams  
3107 E. Louise Avenue  
Salt Lake City, UT 84109

**RE: Ruby Trust Site, Alpine Water Resource Assessment, San Juan County, Colorado**

Dear Mr. Adams,

On September 29, 2021, the Colorado Department of Public Health and Environment (CDPHE) received various reports (historic and current) pertaining to water quality assessments at the Ruby Trust site located at the Ruby Trust mining claim on Ophir Pass Road, San Juan County. Historic reports and current data indicates that the draining adit at the Ruby Trust mine discharges low metals concentration waters and improves the overall water quality of the Middle Fork of Mineral Creek downstream of the mine water inflows. Previous water quality investigations made by the USGS in 1995 and the Colorado DRMS in 2016 produced similar results to those measured by Alpine Water Resources (Alpine) in 2021.

Waste rock at the Ruby Trust site was assessed by Alpine in 2021. The Alpine report indicated that lead concentrations (14,700 parts per million (ppm)) and Arsenic concentrations (14.2 ppm) are both elevated above the Region 9 EPA Residential Risk Based Screening Levels. While waste rock concentrations exceed residential criteria for lead and arsenic, assessment of water quality above and below the waste rock pile indicates no negative impacts from potential contact between the mine drainage and waste rock pile. Further, the waste rock pile does not show any signs of recent erosion or mass wasting and the surface is well cemented. There is no visible vegetation kill zone below the waste rock pile and the receiving wetland appears healthy.

The proposed development for the Ruby Trust site is not proposed for areas where waste rock is present, nor is the development proposed along the adit discharge.

Based on the information provided by yourself, development of this property does not warrant submission into the State of Colorado Voluntary Cleanup Program. The main portion of the development will occur outside the waste rock/ discharge area. Development within the waste rock area will be limited to the installation of a knee wall, water weir and pipe for the purpose of collecting and piping water to a hydropower turbine downgradient. Due consideration has been given to location and installation methods of these proposed improvements. Water will be piped over waste rock and no waste rock will be disturbed. CDPHE is happy to assist the property owner with any questions pertaining to the proposed development as well as answer any questions San Juan County may have pertaining to this proposed development.

If you have any questions, please contact Mark Rudolph at (303) 692-3311 (office) or (303) 916-2179 (cell).

Sincerely,

Mark Rudolph



CDPHE Bonita Peak Superfund Project Manager and Brownfields Coordinator







# USACE PCN Approval (extension currently in process)

DEPARTMENT OF THE ARMY  
CORPS OF ENGINEERS, ALBUQUERQUE DISTRICT  
400 ROOD AVENUE, ROOM 224  
GRAND JUNCTION, CO 81601-2620

October 22, 2021

Regulatory Division

SUBJECT: Nationwide Permit Verification – Action No. SPK-2017-00948, Ruby Placer Driveway

The Lorraine, LLC  
Mr. Cameron Adams  
3107 East Louise Avenue  
Salt Lake City, Utah 84109  
[cka0405@gmail.com](mailto:cka0405@gmail.com)

Dear Mr. Adams:

This letter responds to your preconstruction notification (PCN) for the Ruby Placer Driveway project. The driveway construction and minor hydroelectric project is located off of San Juan County Road 8, within an unnamed tributary to the Middle Fork of Mineral Creek, within Section 4, Township 41 North, Range 8 West, New Mexico Principal Meridian, centered at approximately Latitude 37.84595°, Longitude -107.75208°, 7.3 miles northwest of the Town of Silverton, San Juan County, Colorado.

The work, as described in your submittal, will consist of the construction of a residential driveway and small earthen berm to facilitate a minor hydroelectric project, subject to Section 404 of the Clean Water Act. The specific activity that requires Department of the Army authorization is the discharge of 10 cubic yards of total fill material into waters of the U.S. This activity will result in permanent impacts to 0.02 acre of palustrine emergent wetland and 0.01 acre (30 linear feet) of unnamed perennial stream. The proposed activities would be conducted in accordance with the PCN dated September 10, 2021.

Based on the information provided, we have determined that the project is authorized by Nationwide Permit (NWP) 14 – *Linear Transportation Projects* and NWP 18 – *Minor Discharges*. Permit summaries and the Colorado Regional Conditions are available on our website at <http://www.spa.usace.army.mil/Missions/Regulatory-Program-and-Permits/NWP/>. Please refer to our website at <http://www.spa.usace.army.mil/Missions/Regulatory-Program-and-Permits/Water-Quality-Certification/> for specific information regarding compliance with state water quality certification (WQC) requirements. The permittee must ensure that the work complies with the terms and conditions of the permit, including Colorado Regional Conditions.

This permit verification is valid until March 18, 2022 (33 CFR 330.6), unless the NWP is modified, suspended, revoked, or reissued prior to that date. Continued confirmation that an activity complies with the terms and conditions, and any changes to the NWP, is the responsibility of the permittee. Activities that have commenced, or are under contract to commence, in reliance on an NWP will remain authorized provided the activity is completed within 12 months of the date of the NWP's expiration, modification, or revocation.

Within 30 days of project completion, the permittee must fill out the enclosed Certification of Compliance form and return it to our office. The landowner must allow Corps representatives to inspect the authorized activity at any time deemed necessary to ensure that it is being, or has been, accomplished in accordance with the terms and conditions of the NWP.

If you have any questions, please contact me at the letterhead address, by phone at 970-243-1199, extension 1017, or by email at [Tucker.J.Feyder@usace.army.mil](mailto:Tucker.J.Feyder@usace.army.mil). At your convenience, please complete a Customer Service Survey online at <https://regulatory.ops.usace.army.mil/customer-service-survey/>.

Sincerely,

Tucker J. Feyder  
Project Manager  
NW Colorado Branch

Enclosure

cc:

Ms. Lisa Adair, San Juan County Planning Director, [ladair@silverton.co.us](mailto:ladair@silverton.co.us)



## ON-SITE WASTE WATER TREATMENT PERMIT

APPLICANT	PROPERTY OWNER	INSTALLER
THE LORRAINE, LLC 3107 E LOUISE AVE SALT LAKE CITY, UT 84109 (949) 424-4780	The Lorraine, LLC C/O Cameron Adams 3107 E LOUISE Ave Salt Lake City, UT 84109	LIC #: EXP:

**ADDRESS:** TBD CR 8 (OPHIR PASS ROAD) **PARCEL #:** 48270040040001-S  
**PERMIT TYPE:** CONSTRUCTION **SUBDIVISION:**

**LOT #:** **LOT SIZE (ACRES):** 20.5  
**DWELLING UNITS:** 1 **BEDROOMS:** 3  
**SITE EVAL LTAR:** 0.35 **LIMITING ZONE:**  
**DEPTH:** **WATER SUPPLY:** Well

**SEPTIC TANKS:** 1000 gal MIN  
**DESIGN FLOW:** 450 GPD  
**DISTRIBUTION:** Gravity  
**SOIL TREATMENT:** Trenches (x5) 3' x 60' MAX DEPTH 3'  
14 chambers per trench  
Backfill crusher fines above chambers.  
Top with select native loam material.  
Mound trench backfill to prevent ponding due to settlement. Construct diversion swale above STA to divert run-off around trenches.

**WORK DESCRIPTION:** New OWTS for proposed 3 bd dwelling.

**SPECIAL CONDITIONS**

Verify, visibly mark, and maintain required setbacks prior to and during construction regarding wetland delineation and surface spring water service.

During excavation of soil treatment area, if installer encounters soils that are not consistent with the soil profile report and/ or exhibit more than 35% rock, they must stop work and notify SJBPH and engineer to determine how to proceed.

## AUTHORIZATION TO BEGIN CONSTRUCTION OR REPAIRS

The submitted design and above specifications are authorized for construction, subject to the above special conditions. All provisions of the SJBPH On-site Wastewater Treatment System regulations must be complied with whether specified herein or not. The granting of this permit does not give authority to violate or cancel any other state or local law or regulation governing construction or land use.

*Nicola Pasquini* 12/7/2021  
Authorized By Date

## FINAL INSPECTION

The above system has been inspected and found to comply with the requirements as described on the issued permit.

SITE DEVELOPMENT SOLUTIONS  
C/O MICHAL VALENCIA  
PO BOX 997  
BAYFIELD, CO 81122

System Designed by (name, company, phone) Finalized By Date

# Notice of Intent

rec-1101  
6-24-21

## Notice of Intent to Make Absolute

N.O.I. # 33  
(Assigned by SWCD)

The below identified applicant hereby notices its intent to make absolute an increment of the Animas Service Area conditional water right decreed in Case No. 06CW127 consistent with the terms and conditions decreed therein. Use additional pages as needed

### Applicant Information:

Name: Cameron Adams Telephone: 949-424-4780

Email Address: cka0405@gmail.com

Mailing Address: 3107 e louise ave, Salt Lake City, UT 84109

(The approved NOI will be mailed to this address)

### Prospective Water Right Increment Information:

Proposed Use of Water (e.g. domestic, irrigation, commercial):

Household use in one home, hydroelectric power generation (non-consumptive)

Proposed Source (groundwater, surface water):

Surface water (spring) from mine adit

Proposed Place of Use (include parcel # if possible):

Ruby Placer, MS 16941, San Juan County, Colorado

Anticipated Amount of Depletions (number of acres irrigated, stock use, domestic surface area, and pond evaporation, etc. in the time periods per the 06CW127 decree):

Jan	0.000081
Feb	0.000081
Mar	0.000081
Apr 1-14	0.000081
Apr 15 - 30	0.000081
May	0.000081
June 1-14	0.000081
June 15-30	0.000081
July 1-14	0.000081
July 15-31	0.000081
Aug	0.000081
Sep	0.000081
Oct	0.000081
Nov	0.000081
Dec	0.000081



The applicant is advised and recognizes that the execution of this Notice of Intent to Make Absolute confers no right, title, or interest in water beyond the right to perfect an increment of the Animas Service Area conditional water right consistent with the decree in Case No. 06CW127.

Applicant is hereby given authority by Southwestern Water Conservation District and La Plata County to file an application to make the conditional water right absolute pursuant to the terms and conditions in Case No. 06CW127. The Southwestern Water Conservation District and La Plata County reserve the right to file opposition to such claim if deemed necessary.

  
Signed for the Applicant, (Title)

6/24/21  
(Date)

Cameron Adams  
Printed Name

**Governmental Endorsements:**

Neal Starkebaum  
La Plata County

10/19/21  
(Date)

NEAL STARKEBAUM DIRECTOR, LPC CD DEPT.  
Printed Name

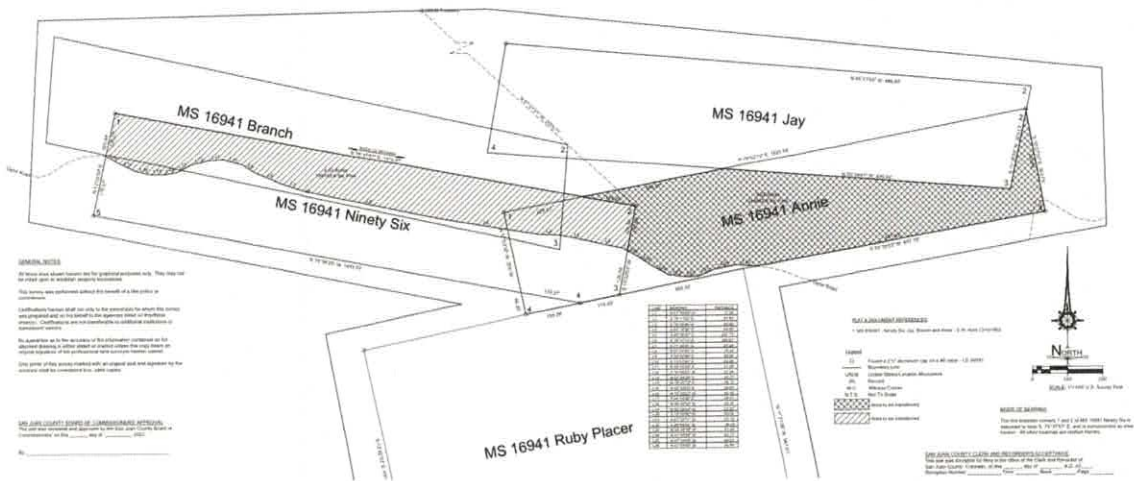
Stevan Wolff  
SWCD

10/12/21  
(Date)

STEVAN WOLFF  
Printed Name

# Part II: Boundary Line Adjustment

Proposed Boundary Line Adjustment Between the Annie, Jay, Ninety-Six, and Branch Lode Claims to Align with CR8  
TDB County Road 8  
Township 42 N, Range 8 West, Section 4, NMPM  
MS 16941



**Applicant:**  
The Kinley, LLC  
Cameron Adams, Member  
3107 E. Louise Ave  
Salt Lake City, UT 84109  
(949) 424-4780

**Co-Applicant:**  
Pilatus LLC  
Thomas Popov, Manager  
702 Patterson Ave  
Austin, TX 78703  
(512) 563-8484

**Submitted:**  
03/22/2022



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2. Supporting Documentation
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  - B. Survey
  - C. Preliminary Boundary Map
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  - G. Pilatus LLC Property deeds

# Project Narrative

## Disclaimer

This application is divided into two parts. Part I is relevant to the improvement plans of Mr. Adams which will take place entirely on his land. Part II concerns the boundary line adjustment between Mr. Adams and Mr. Popov. For logistical reasons the two parts were combined into a single application. This allows a decreased workload for the county and the applicants. Also, a great deal of supporting documentation is shared between the two.

However, it should be noted that neither Mr. Popov nor his companies are in any way related to part I of this application. Please consider part I and II of this application as distinct and separate aside from the common supporting documentation.

## Legal Property Description

Absent any boundary line adjustments, Mr. Adams owns five contiguous claims through two separate limited liability companies. The Lorraine, LLC owns the Ruby Pacer Mining Claim. The vast majority of improvements proposed in Part I of this application will take place on this claim. The Kinley, LLC owns 4 additional lode claims which are contiguous to the Ruby Placer. Those parcels are the Annie, Ninety-Six, September, and Snowshoe lode claims. Approximately 57 acres are owned by Mr. Adams before the proposed boundary adjustment takes place. Mineral rights are also in the possession of Mr. Adams.

Mr. Popov currently owns 20 claims totaling 174 acres through two separate limited liability companies. Pilatus LLC owns 16 of those claims (N2817) which are contiguous and lie immediately north of the Annie and Ninety-Six claims. Outlot Pines LLC owns 4 additional claims (N2828) which are located south-west of the Annie and Ninety-six on the opposing hillside.

Upon approval of the boundary adjustment, 4.3 acres of the Ninety-Six would be absorbed by the Branch and 5.6 acres of the Annie would be absorbed by the Jay. As a result, Mr. Adams would own 47 acres across five claims while Mr. Popov would own 184 acres across 20 claims, post adjustment.

This portion of the application focuses on the Annie, Ninety-Six, Branch and Jay lode Claims which can be found under MS 16941. These claims have significant areas of overlap. Possession of overlap areas depends on a parcels' seniority. The senior parcel retains possession of the overlap area whereas the junior yields possession of said area. Notably, the Ninety-Six is the senior claim in areas where it overlaps the branch and Annie claims. The Annie is the junior claim in areas of overlap with the Ninety-Six and Jay claims. All acreages mentioned in this applicant are "net", meaning that seniority has been accounted for in areas of overlap. The net acres of each parcel can be verified in the field notes which are on file at the county assessor's office.

## Zoning

All property in question resides in the Mountain zone, below 11,000 ft. No overlay or protection districts apply. Reference Part I: Section 3 of this application for zoning maps.



## Property and Surrounding Area

The Annie and Ninety-Six claims are not what one would expect when visualizing Ophir Pass. Contrary to the rocky, open and steep images that generally come to mind, both claims are on a mostly forested hillside with slope angles ranging from 10 to 30 degrees.

The area surrounding the Annie and Ninety-Six claims is a mixture of densely forested hillside and open meadow. Hillside slope ranges from nearly flat to approximately 30 degrees. The claims are bordered by private property to the north and south and by national forest to the east and west. Reference the annotated property map in Part II: section 2 for a visual depiction of property ownership in the surrounding area.

## General Description

The Annie and Ninety-Six claims and the property immediately to the south are owned by Mr. Adams. The Property to the north of those claims is owned by Mr. Popov. The Annie and Ninety-Six are bisected by County Road 8. This creates an unnatural and seemingly arbitrary property boundary between the two owners. Mr. Adams owns a thin slice of land to the north of the county road while Mr. Popov owns a wide swath of land to the north of the roadway.

This application seeks approval to adjust the property boundary between the Annie and Ninety-Six claims to the south and the Jay and Branch claims to the north to be co-located with the centerline of county road 8. Consequently the Jay and Branch claims would each gain approximately 5 acres while the Annie and Ninety-Six would each lose approximately 5 acres.

An agreement has been reached between the two property owners to provide adequate compensation for the transfer of the above described land. This sales agreement is contingent upon, but not related to, approval of this application and subsequent recording of the boundary adjustment.

It is important to note that this adjustment would not result in any change in number of parcels, thereby avoiding county subdivision regulations. It also will not result in an increase in the total number of property owners since all four parcels affected will remain under their current ownership. The only change will be the size of each parcel.

General "buildability" will remain unchanged on the Ninety-Six and Branch claims. The Jay, which already contains a buildable area, will have another buildable area added to it when it absorbs the portions of the Annie which lie north of the road. The Annie will become a small and un-buildable parcel as it loses its buildable area to the Jay. Therefore, approval of this boundary line adjustment will result in a decrease in potentially buildable parcels.

Refer to the preliminary plat map contained in Part II: Section 2 of this application for a depiction of the area to be transferred.

## Use

The adjusted Annie and Ninety-Six parcels (portion south of CR8) will remain under the ownership of Mr. Adams and be used for access, infrastructure and picnicking type activities. The most impactful infrastructure project is the driveway, which was installed by the previous owner and remains in place today. In the near future the driveway will be improved and a hydro-electric system will be installed partially in this area. Refer to Part I of this application for detailed information regarding Mr. Adams' improvement plans.

The Jay and Branch parcels will remain under the ownership of Mr. Popov but will be enlarged to incorporate the boundary adjustment. Mr. Popov purchased this property in September 2021 and is excited to explore the property and surrounding area this summer. As such, his plans are very preliminary.

Neither the applicant nor Mr. Popov anticipate disturbing the peace and tranquility of the area through their use of this land. Use of ATVs/UTVs, excessive firearms use and generally noisy activities are certainly not planned by either party.

## Access and Easements

Access to the area can easily be accomplished via CR8 seasonally. Winter access can be accomplished by foot or over snow vehicle. This project will have no effect on public access to the area.

A 60 ft wide easement exists for CR8 as it crosses both the un-adjusted Annie and Ninety-Six claims. An easement also exists just up hill for the power lines which traverses both parcels. Finally a recorded easement exists on the Ninety-Six only to allow the construction of a private road to connect CR8 to CR8A. Approval of this application would cause that easement to transfer to the Branch claim but would only apply to the area originally contained in the Ninety-Six claim.

## Historic Impact

The proposed boundary adjustment will not effect any historical sites or objects. Most objects of historical value can be found on the Ruby Placer to the south of the adjusted boundary line. Access to this area will not change. There are no known objects or sites that will be divided by the proposed adjustment. A full historic impact review has been completed and a summary letter is included in Part I of this application. That review includes the entire area under the consideration of this portion of the application.

## Cumulative Impact

The proposed boundary adjustment will have no impact to the general public. While the total number of parcels will not change as a result of this application, the total number of buildable parcels will decrease by one. This aligns with the San Juan County's goal of limiting backcountry development while respecting private property rights. Realistically, this adjustment will have no effect on the number of structures in the area since the total number of property owners will remain the same. Given the county's policy of parcel consolidation upon improvement permit approval, total number of owners remains the most applicable variable relating to development.

On a related note, approval of Part I of this application will, upon commissioner request, trigger the restriction or consolidation of Mr. Adams land holdings immediately, respecting the proposed boundary adjustment.

## Environmental Impact

Environmental impact is essentially tied to the number of structures built and area disturbed to access those structures. The number of structures in the area will not change as a result of the proposed boundary adjustment.

## Hazards

The parcels in question are located in an area at risk of avalanche, environmental and wild fire hazards. An avalanche study is attached to this application and shows slides paths crossing the east and western extremes of the un-adjusted Annie and Ninety-Six. Safe terrain exists in between those two extremes and covers the majority of the parcels. The environmental hazard is associated with the mine adit which is actively draining water in the area of overlap between the Annie and Ninety-Six parcels. Ownership of the Maine adit area would remain unchanged by the boundary adjustment. Finally there is always the risk of wildfire in the forest. Again, the proposed boundary adjustment will have no effect on that risk, positive or negative.

The parcels under consideration are clear of known flood and geotechnical hazard areas.



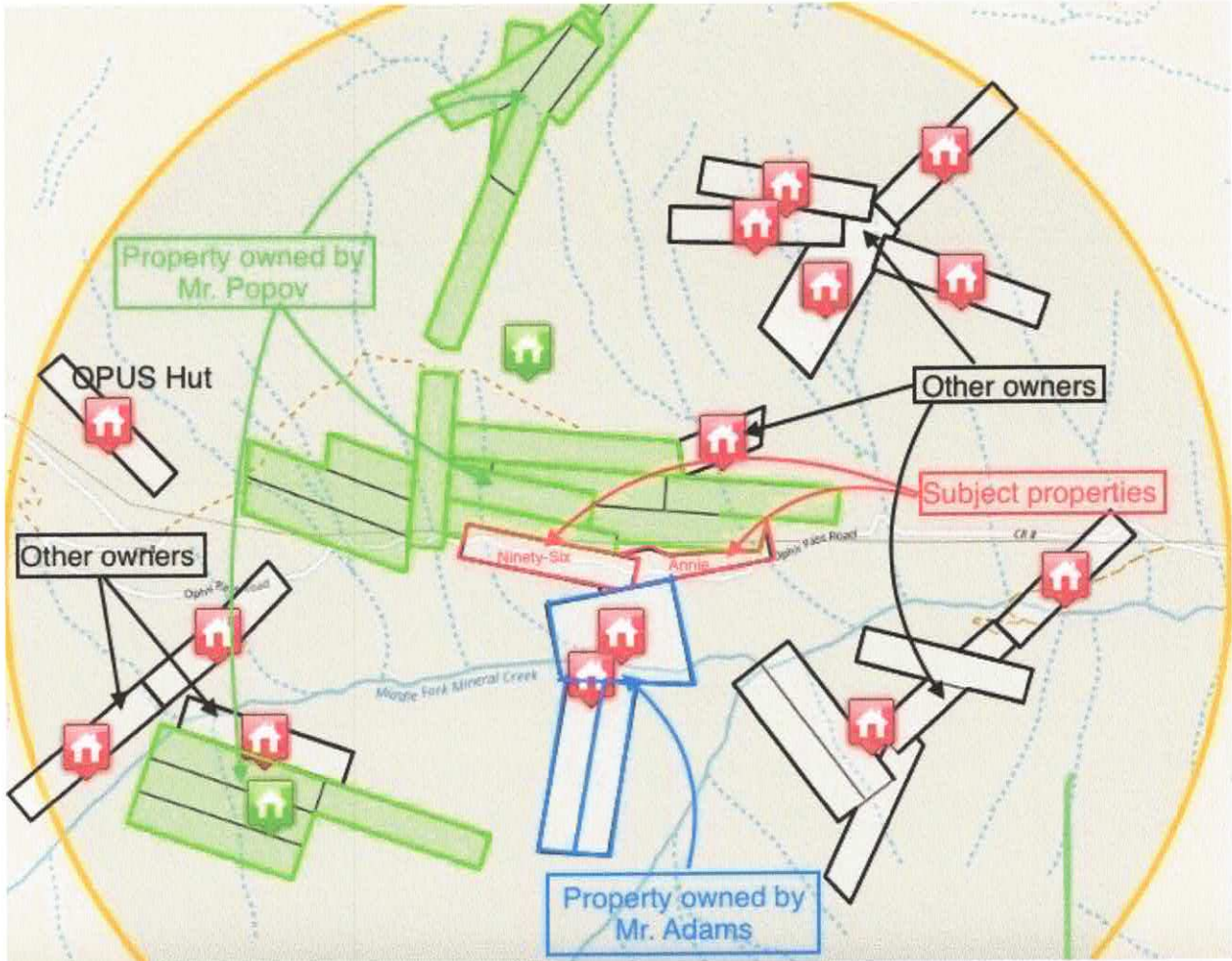
An extensive summary of the above risks is contained in Part I of this application. Though tailored to the Ruby Placer parcel, these reports remain applicable to the area of concern for the boundary line adjustment. Please reference Part I of this application for more information, including hazard maps.

## Applicant Disposition

Both the applicants love the land under their stewardship and are committed to protecting it from over development and misuse. Each has informally agreed to avoid subdividing for profit and both intend to consolidate or otherwise restrict their land holdings when their respective improvement applications are approved.



# Vicinity Map



Map of Private Property Within 1 Mile

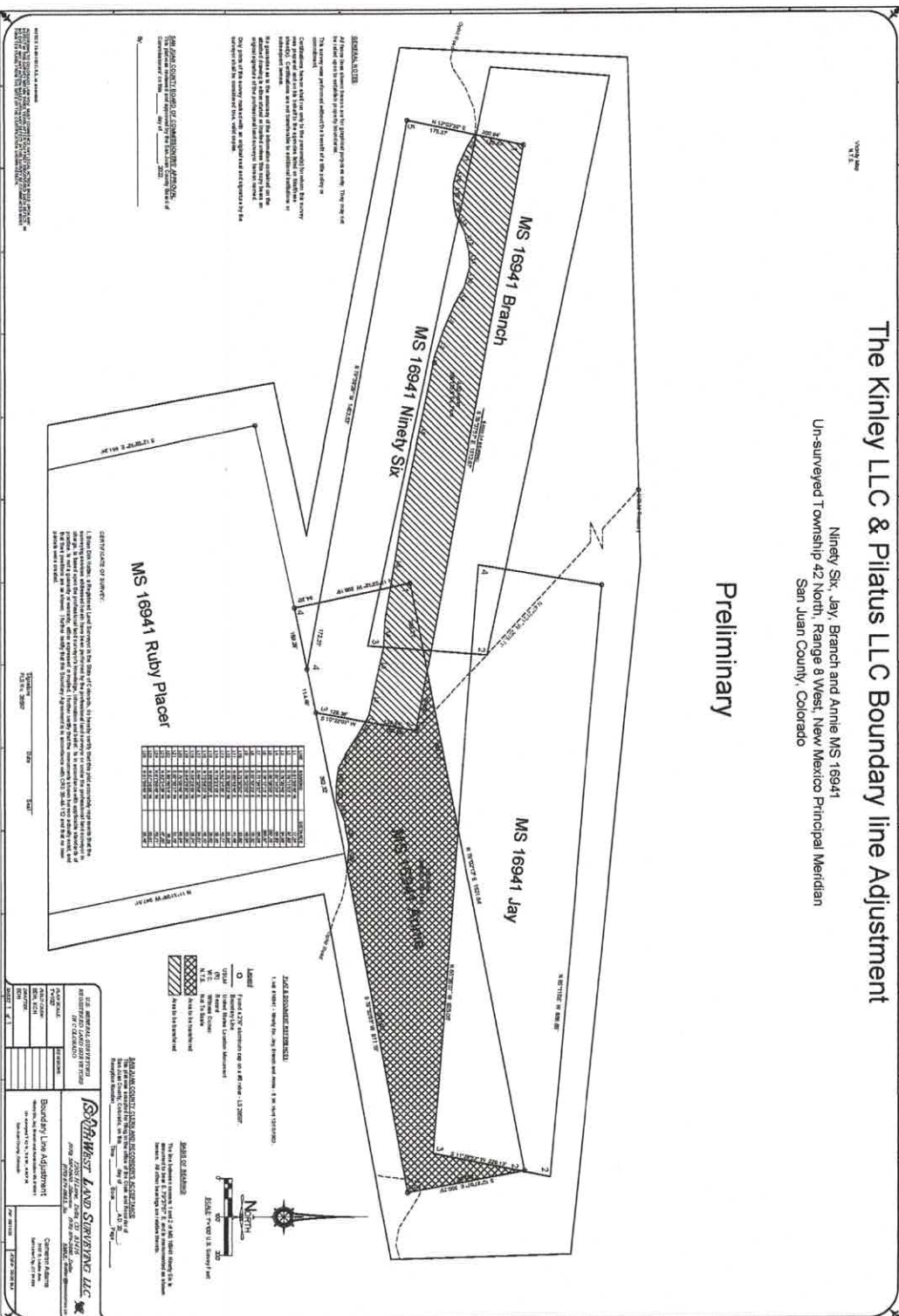


Scale 1" = 100'

# The Kinley LLC & Pilatus LLC Boundary line Adjustment

Ninety Six, Jay, Branch and Annie MS 16941  
 Un-surveyed Township 42 North, Range 8 West, New Mexico Principal Meridian  
 San Juan County, Colorado

## Preliminary

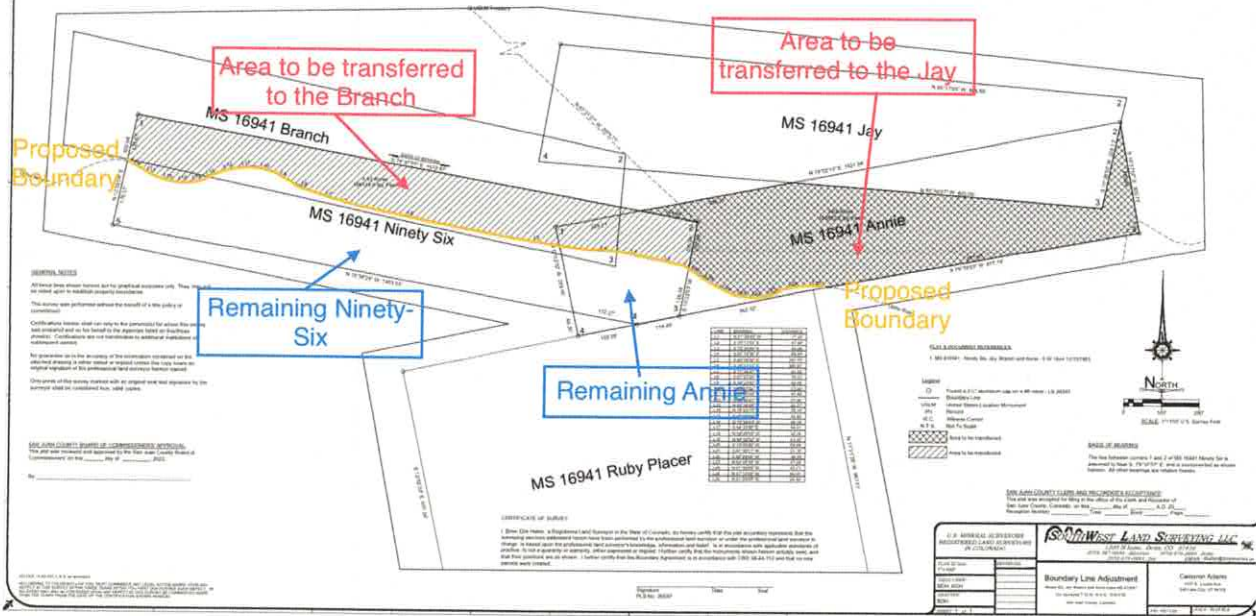




# The Kinley LLC & Pilatus LLC Boundary line Adjustment

Ninety Six, Jay, Branch and Annie MS 16941  
 Un-surveyed Township 42 North, Range 8 West, New Mexico Principal Meridian  
 San Juan County, Colorado

Preliminary



Annotated Boundary Map

# Mailing List (Same as Part I List)

RUBY BASIN LAND CO LLC  
319 WILLOW DR  
DURANGO CO 81301-7573

PILATUS LLC  
702 PATTERSON AVE  
AUSTIN TX 78703-4724

INDEPENDENCE LAND TRUST LLC  
PO BOX 26982  
TAMPA FL 33623

KINLEY LLC, THE; c/oCameron Adams  
3107 E LOUISE AVE  
SALT LAKE CITY UT 84109

LORRAINE LLC, THE; c/oCameron  
Adams  
3107 E LOUISE AVE  
SALT LAKE CITY UT 84109

OUTLOT PINES LLC  
702 PATTERSON AVE  
AUSTIN TX 78703-4724

After Recording Return To:  
Alpine Title  
P.O. Box 4158  
Telluride, CO 81435

**STATEMENT OF AUTHORITY**

1. This Statement of Authority relates to an entity named: **Pilatus, LLC**
2. The Entity is a: **limited liability company**
3. The Entity is formed under the laws of: **Colorado**
4. The mailing address for the entity is:  
**702 Patterson Ave., Austin, TX 78703**
5. The name and position of each person authorized to execute instruments conveying, encumbering, or otherwise affecting title to real property on behalf of the entity is: **Thomas Popov, Manager.**
6. The authority of the foregoing person(s) to bind the entity **is not limited.**
7. Other matters concerning the manner in which the entity deals with interests in real property: **NONE**
8. This Statement of Authority is executed on behalf of the Entity pursuant to the provisions of C.R.S. Section §38-30-172.

Executed this: October 13, 2021

Pilatus, LLC, a Colorado limited liability company


  
By: **Thomas Popov, Manager**

STATE OF: Colorado  
COUNTY OF: Archuleta

The foregoing instrument was acknowledged before me this 13 day of October, 2021, by Thomas Popov, Manager of Pilatus, LLC, a Colorado limited liability company

Witness my hand and seal.

My commission expires: 02/02/2022

  
Notary Public

JENNETTE MARTINEZ  
NOTARY PUBLIC  
STATE OF COLORADO  
NOTARY ID# 19984002061  
MY COMMISSION EXPIRES FEB 2, 2022



State Documentary Fee  
\$90.00 10-19-2021

WARRANTY DEED

THIS DEED, made this 13<sup>th</sup> day of October, 2021, between Ruby Basin Land Co. LLC, a Colorado limited liability company of the County of San Juan and State of Colorado, grantor(s),

And  
Pilatus, LLC, a Colorado limited liability company whose legal address is 702 Patterson Ave., Austin, TX 78703 of the County of San Juan and State of Colorado, grantee(s):

WITNESS, that the grantor(s), for and in consideration of the sum of NINE HUNDRED THOUSAND AND 00/100 DOLLARS (\$900,000.00), the receipt and sufficiency of which is hereby acknowledged, has granted, bargained, sold and conveyed, and by these presents does grant, bargain, sell, convey and confirm unto the grantees, their heirs and assigns forever, all the real property, together with improvements, if any, situate, lying and being in the County of San Juan and State of Colorado, described as follows:

FOR LEGAL DESCRIPTION SEE EXHIBIT A

also known by street and number as: Western, Silverton, CO 81433

TOGETHER with all and singular the hereditaments and appurtenances thereunto belonging, or in anywise appertaining, and the reversion and reversions, remainder and remainders, rents, issues and profits thereof, and all the estate, right, title, interest, claim and demand whatsoever of the grantor, either in law or equity, of, in and to the above bargained premises, with the hereditaments and appurtenances.

TO HAVE AND TO HOLD the said premises above bargained and described, with the appurtenances, unto the grantees, their heirs and assigns forever. And the grantor, for himself, his heirs and personal representatives, does covenant, grant, bargain and agree to and with the grantees, their heirs and assigns, that at the time of the enrolling and delivery of these presents, he is well seized of the premises above conveyed, has good, sure, perfect, absolute and indefeasible estate of inheritance, in law, in fee simple, and has good right, full power and lawful authority to grant, bargain, sell and convey the same in manner and form as aforesaid, and that the same are free and clear from all former and other grants, bargains, sales, liens, taxes, assessments, encumbrances and restrictions of whatever kind or nature, except for taxes for the current year, a lien but not yet due and payable, subject to statutory exceptions as defined in CRS 38-30-113, revised.

The grantor shall and will WARRANT AND FOREVER DEFEND the above-bargained premises in the quiet and peaceable possession of the grantees, their heirs and assigns, against all and every person or persons lawfully claiming the whole or any part thereof.

The singular number shall include the plural, the plural the singular, and the use of any gender shall be applicable to all genders.

IN WITNESS WHEREOF, the grantor has executed this deed on the date set forth above.

Ruby Basin Land Co. LLC, a Colorado limited liability company

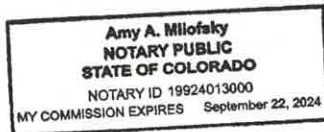
*Gregg C. Donaldson*  
By Gregg C. Donaldson as Managing Member

State of Colorado }  
County Of La Plata } ss.

The foregoing instrument was acknowledged before me this October 13, 2021, by Gregg C. Donaldson as Managing Member of Ruby Basin Land Co. LLC, a Colorado limited liability company.

My Commission expires: 9/22/2024 Witness my hand and official seal.

*Amy A. Milofsky*  
Notary Public



GENERAL WARRANTY DEED

3237CEA  
October 13, 2021  
12:50 PM

**Exhibit 'A'**

Alhambra Lode Mining Claim, MS 16941, as described in Patent recorded November 3, 1905 in Book A5 at page 361 and in the Donaldson Boundary line Adjustment recorded February 19, 2021 at Reception No. 153358;

Barbara Alan Lode Mining Claim, MS 12902, as described in Patent recorded October 26, 2016 at Reception No. 150786;

Branch Lode Mining Claim, MS 16941, as described in Patent recorded November 3, 1905 in Book A5 at page 361;

Cary Lode Mining Claim, MS 1339, as described in Patent recorded January 24, 1889 in Book A2 at page 349;

December Lode Mining Claim, MS 16941 as described in Patent recorded November 3, 1905 in Book A5 at page 361;

Della Lode Mining Claim, MS 16941, as described in Patent recorded November 3, 1905 in Book A5 at page 361;

Highway Lode Mining Claim, MS 16941, as described in Patent recorded November 3, 1905 in Book A5 at page 361;

Jay Lode Mining Claim, MS 16941, as described in Patent recorded November 3, 1905 in Book A5 at page 361;

La Plata Miner Lode Mining Claim, MS 1131, as described in Patent recorded October 26, 2016 at Reception No. 150784;

Regina Lode Mining Claim, MS 16941, as described in Patent recorded November 3, 1905 in Book A5 at page 361;

Ruby Lode Mining Claim, MS 15204, as described in Patent recorded October 26, 2016 at Reception No. 150785;

Stonewall Lode Mining Claim, MS 1338, as described in Patent recorded January 24, 1887 in Book A2 at page 357;

U.S. Treasury Lode Mining Claim, MS 1336, as described in Patent recorded January 24, 1887 in Book A3 at page 353;

U.S. Treasury No. 2 Lode Mining Claim, MS 1048, as described in Patent recorded May 12, 1913 in Book A8 at page 102

U.S. Mint Lode Mining Claim, MS 1337, as described in Patent recorded January 24, 1887 in Book A2 at page 361;

Western Lode Mining Claim, MS 16941, as described in Patent recorded November 3, 1905 in Book A5 at page 361;

Mineral Rights Associated with the unpatented Kumbaya Lode, Location Certificate recorded September 15, 2020 Reception No. 153050;

All in Red Mountain Mining District,  
County of San Juan,  
State of Colorado.

**SPECIAL WARRANTY DEED**

**THIS DEED**, Made this 13<sup>th</sup> day of October, 2021, between **Ruby Basin Land Co. LLC, a Colorado limited liability company** of the County of San Juan and State of Colorado, grantor(s), and **Pilatus, LLC, a Colorado limited liability company** whose legal address is 702 Patterson Ave., Austin, TX 78703 of the County of San Juan and State of Colorado, grantee(s):

**WITNESS**, that the grantor(s), for and in consideration of the sum of **TEN AND 00/100 DOLLARS (\$10.00)**, the receipt and sufficiency of which is hereby acknowledged, has granted, bargained, sold and conveyed, and by these presents does grant, bargain, sell, convey and confirm, unto the grantee(s), his heirs and assigns forever, all the real property, together with improvements, if any, situate, lying and being in the County of San Juan and State of Colorado, described as follows:

Any and all water rights, water storage rights, geothermal rights, whether adjudicated or unadjudicated, any and all entitlements to water, whether contractual, by permit, or otherwise, and any and all groundwater rights, whether tributary or non-tributary, and whether adjudicated or not, and any and all water rights historically used upon and /or appurtenant to the Property, along with and including all permits, easements, structures, ditches, pipelines, headgates, wells, springs, pumps, measuring devices, and other facilities necessary for or used in connection with the exercise of such rights; appurtenant to the real property including, but not limited to that listed on **EXHIBIT 'A'**

**TOGETHER** with all and singular the hereditaments and appurtenances thereunto belonging, or in anywise appertaining, and the reversion and reversions, remainder and remainders, rents, issues and profits thereof, and all the estate, right, title, interest, claim and demand whatsoever of the grantor(s), either in law or equity, of, in and to the above bargained premises, with the hereditaments and appurtenances;

**TO HAVE AND TO HOLD** the said premises above bargained and described with the appurtenances, unto the grantee(s), his heirs and assigns forever. The grantor(s), for himself, his heirs, and personal representatives or successors, does covenant and agree that he shall and will **WARRANT AND FOREVER DEFEND** the above-bargained premises in the quiet and peaceable possession of the grantee(s), his heirs and assigns, against all and every person or persons lawfully claiming the whole or any part thereof, by, through or under the grantor(s).

The singular number shall include the plural, the plural the singular, and the use of any gender shall be applicable to all genders.

**IN WITNESS WHEREOF**, the grantor has executed this deed on the date set forth above.

**Ruby Basin Land Co. LLC, a Colorado limited liability company**

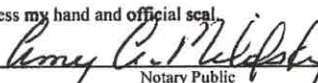
  
By **Gregg C. Donaldson as Managing Member**

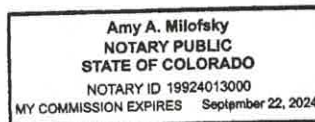
STATE OF COLORADO

COUNTY OF La Plata

The foregoing instrument was subscribed, sworn to, and acknowledged before me this 13<sup>th</sup> day of October, 2021, by **Gregg C. Donaldson as Managing Member of Ruby Basin Land Co. LLC, a Colorado limited liability company.**

My Commission expires: 9/22/2024

Witness my hand and official seal.  
  
Notary Public





**EXHIBIT "A"**

**Alhambra Lode Mining Claim, MS 16941, as described in Patent recorded November 3, 1905 in Book A5 at page 361 and in the Donaldson Boundary line Adjustment recorded February 19, 2021 at Reception No. 153358;**

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**Mineral Rights Associated with the unpatented Kumbaya Lode, Location Certificate recorded September 15, 2020 Reception No. 153050;**

**All in Red Mountain Mining District,  
County of San Juan,  
State of Colorado.**

## Appendix

### 1. Avalanche Study



**AVALANCHE HAZARD ASSESSMENT  
FOR THE**

**RUBY PLACER AND TORNADO CLAIM,  
SAN JUAN COUNTY, COLORADO**

**PROJECT SITE**

**PREPARED FOR:**

**MR. GREGG DONALDSON  
PROJECT NUMBER: 54717AV  
JUNE 22, 2017**

## **1.0 INTRODUCTION**

This report presents our snow avalanche hazard assessment for the Ruby Placer and Tornado Claim near Silverton, Colorado approximately eight miles northwest of Silverton, Colorado. Our study was requested by Mr. Gregg Donaldson and was performed in accordance with the scope of services outlined in our May 2, 2017 proposal.

This avalanche hazard study presents an evaluation and detailed discussion of the site exposure of the property owned by Mr. Donaldson including the Ruby Placer and Tornado mining claims near Silverton, Colorado to avalanche hazard. Our avalanche hazard analysis is based on our surface observations, a review of available literature, avalanche mapping for the area, dendrochronology, avalanche dynamics modeling and on our experience in the area. This study includes expected design level pressures from avalanche debris, avalanche runout distances and return periods.

This study does not include design level geotechnical engineering consultation. This study includes avalanche mitigation design concepts.

### *1.1 Geologic Hazard Definition and Discussion*

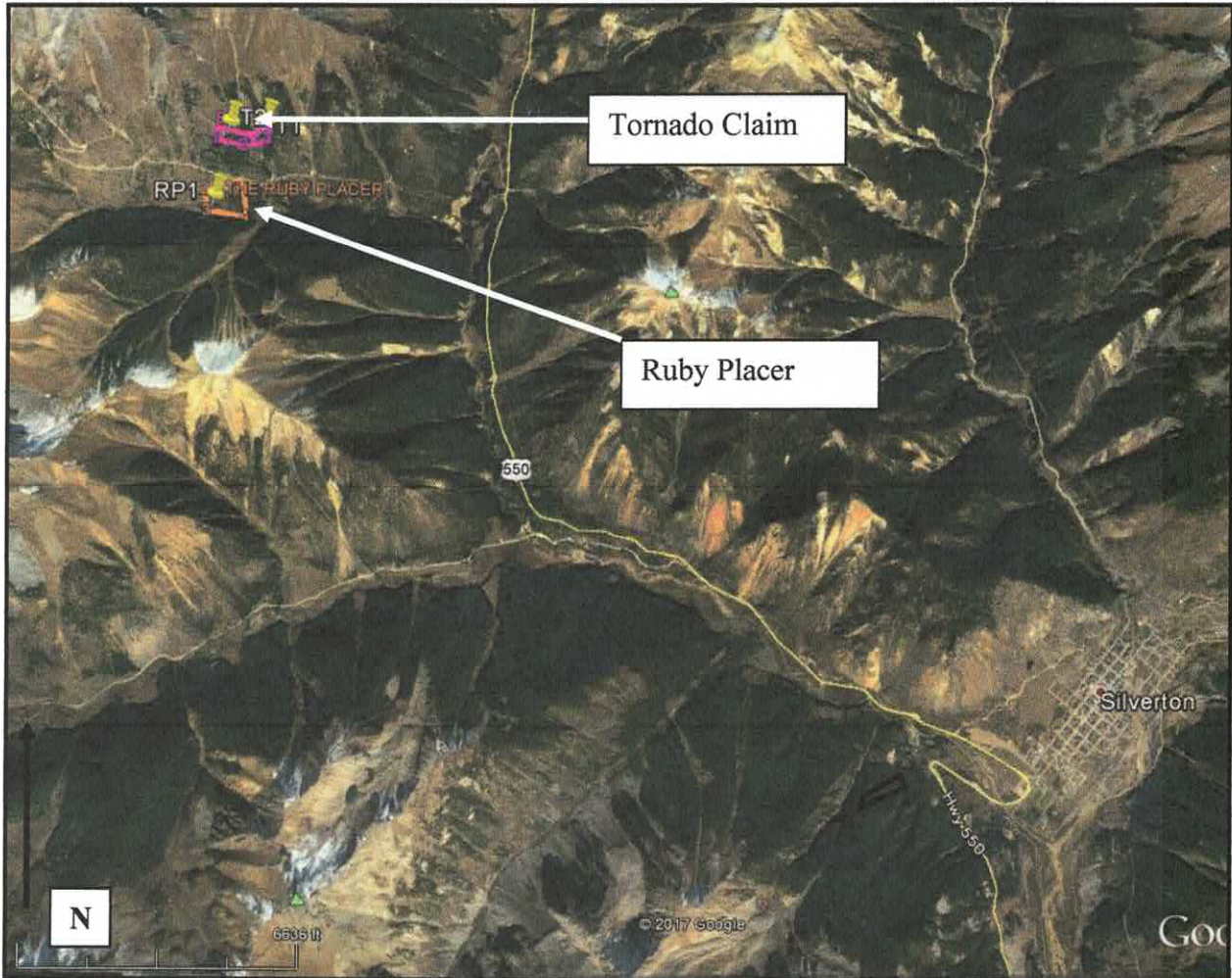
There are three (3) statutes that were adopted by the Colorado Legislature that are pertinent to geologic hazards and land use. “The Land Use Act” of 1970 established the basis for which later bills could be enforced. The Land Use Act mandated that decisions and authority to develop and enforce land use planning regulations should be conducted at local government levels. Senate Bill 35 (1972) required that local county governments either adopt land use planning regulations for subdivisions or follow a model set of regulations developed by the state. In 1974 the Colorado House amended the Land Use Act by adopting House Bill 1041.

House Bill 1041 provided legal definition of natural and geologic hazards. A natural hazard is considered any hazard from geologic conditions, wildfire, or flooding. A geologic hazard is defined as “a geologic phenomenon which is so adverse to past, current, or foreseeable construction or land use as to constitute a significant hazards to public health and safety or to property”. The geologic hazards identified and defined in HB 1041 include; avalanche, landslide, rockfall, mudflow and debris fans, unstable or potentially unstable slopes, seismic effects, radioactivity and ground subsidence.

## **2.0 PROJECT BACKGROUND, SCOPE OF DEVELOPMENT AND SCOPE OF STUDY**

The subject property is located on CR 8 (Ophir Pass Road) in San Juan County, Colorado approximately six miles northwest of Silverton, Colorado (Figure 1).





**Figure 1**  
*Location map of the Ruby Placer and Tornado Claim*

### 2.1 *Current Scope of Development*

We understand that the proposed project will consist of constructing a small cabin on one of 2 possible parcels in the Ruby Basin area near the Ophir Pass Road north of Silverton, CO. We will evaluate the avalanche hazard on both of the parcels. We understand that the building envelope for the cabin site has not been chosen and part of the study will include evaluation of a suitable area based on the expected avalanche hazard for the parcels.



## *2.2 Scope of This Avalanche Hazard Study*

We performed a field reconnaissance of the site on May 23, and June 2, 2017. The site observations include detailed observations of portions of the site to evaluate the existence and potential significance of avalanche hazards that may influence the site property. The analysis and maps within this report do not cover avalanche hazards outside of the subject property. The general scope of our study included the following;

- Field observations including a description of the site topography.
- We observed the site for evidence of avalanche hazards outlined in Colorado House Bill 1041.
- Identification of avalanche hazards that may influence the site.
- Tree coring to determine dendrochronology of past avalanche events and age of trees in and adjacent to the avalanche paths.
- Avalanche dynamics modeling to determine the potential runout length and impact pressures of design-level avalanches.
- We prepared an avalanche hazard map which is included as Figures 4 and 5 of this report.
- We are available to provide continued consultation through the review and approval process of this project.

As requested our scope of service only includes an avalanche hazard evaluation. This report does not provide general geologic hazard assessment of geotechnical engineering subsurface exploration or recommendations. If additional geologic hazard assessment or a geotechnical engineering study is desired, we are available to develop a scope of service and associated fees for these services as the project progresses.

## **3.0 GENERAL AVALANCHE DISCUSSION**

### *3.1 General Avalanche Hazard Discussion*

Avalanche paths generally consist of three parts:

- the starting zone, where avalanches initiate,
- the track, where avalanches reach maximum velocity, and,
- the runout zone where avalanches decelerate and deposit snow and debris.

Avalanche paths can be either unconfined or channelized or have a combination of both. In Colorado, many avalanches are confined by gullies and forested areas.

The destructive force of avalanches occurs in two ways, the force from the powder blast which is at the leading edge of a moving avalanche and the force from the dense, flowing debris which makes up the bulk of entrained snow. The dense debris has the largest impact pressures and typically follows behind the powder blast by a few seconds. The magnitude of the avalanche impact pressure depends on the velocity of the flow and density of the snow as well as the angle of the impacted structure to the flow. The maximum impact pressure occurs on a structure with a wall perpendicular to the flow. As this angle is decreased, the force per unit area or pressure decreases, so that the calculated design pressure for a structure can vary from the predicted impact pressure.

Avalanches have return periods similar to floods based on the probability of avalanche occurrence. Some avalanche paths have avalanches occur numerous times during the winter season. Other avalanche paths only have avalanche occurrences every one to three hundred years. For example, a return period of 100 years has a probability of occurrence of 0.01 in any given year. Unlike floods, the return period of an avalanche is dependent on extreme weather events and the structure of the snowpack when the extreme weather event occurs. Similar to floods, the probability of an avalanche occurring is not dependent on the time since the last event.

Avalanche hazard zoning is usually based on the design avalanche. The “design avalanche” has a destructive potential that depends on the return period and the encounter probability. The only reliable method for accurate identification of the return period and encounter probability is a long observation period that is at least twice as long as the design period (Mears, 1992). For most zoning situations the design avalanche is based on an avalanche with a 100 year return period.

Avalanche paths near residential areas in Colorado are generally delineated into two zones; the Red or High Hazard Zone and the Blue or Moderate Hazard Zone. The Red Zone is generally defined as an area affected by an avalanche with a return period of less than 30 years or by an avalanche with a dynamic impact pressure of greater than 30 kPa (or 600 lb/ft<sup>2</sup>). The Blue Zone is generally defined as an area affected by an avalanche with a return period of 30 to 100 years and also by an avalanche with a dynamic impact pressure of less than 30 kPa (or 600 lb/ft<sup>2</sup>). Residential and commercial structures are generally permitted in Blue Zones when some type of mitigation is incorporated into the design of the building. Avalanche hazard zoning is not consistent within the state of Colorado and is usually defined by the county government. Some municipalities have adopted specific avalanche hazard zoning rules.

### *3.2 Regional Avalanche Hazard Discussion*

The Ruby Placer and Tornado Claim are located in the San Juan Mountains of southwestern Colorado. Avalanches typically occur in the San Juan Mountains from November through May, though extraordinary snowfall events can cause avalanches to occur earlier or later in the winter season. Avalanches in the San Juan Mountains typically stay within well-defined avalanche paths, but can over-run historic avalanche paths during periods of unusually heavy snow fall.



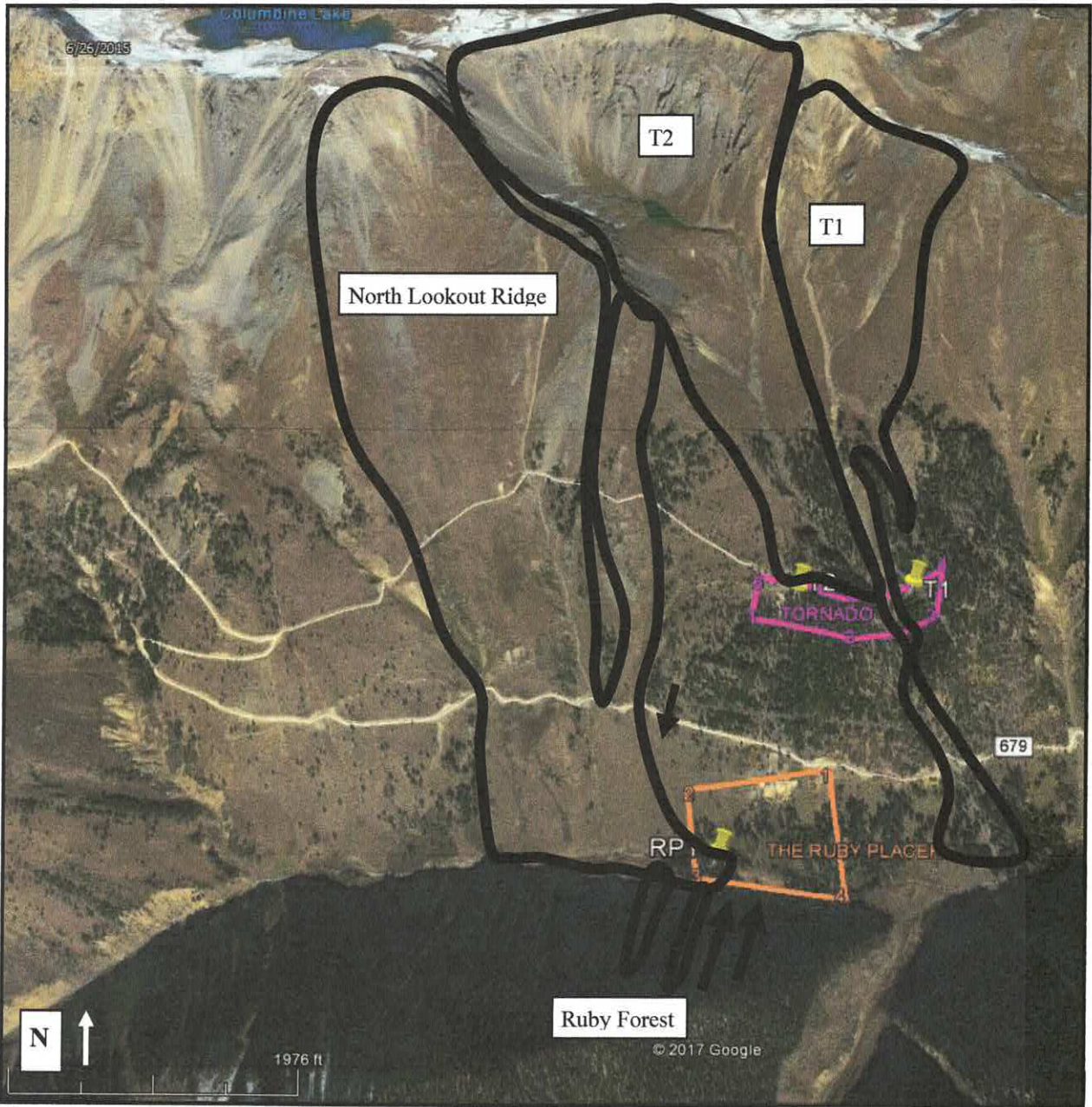
Heavily timbered slopes are not necessarily safe from avalanche hazards particularly where the avalanche initiates on open slopes above the timbered slopes.

We discussed historic avalanche activity on the Ophir Pass Road, CR 8 with Mr. Louis Girodo, the San Juan County Road and Bridge supervisor, on June 15, 2017. Mr. Girodo said that he has seen the North Lookout Ridge avalanche path deposit 25-30 feet of avalanche debris on the Ophir Pass Road and that it runs about every year. He noted the numerous avalanche fatalities in the area including the mail carrier who perished in an avalanche on Ophir Pass Road in the early 1900's. He also noted that the Bonner Mine on the south side of Mineral Creek (less than one mile from the Ruby Placer), was hit by an avalanche that destroyed some historic cabins sometime in the 1970's. There have been recent avalanche fatalities of backcountry skiers in the vicinity of Ophir Pass.

### *3.3 Avalanche Path Characteristics*

There are numerous avalanche paths, some with multiple starting zones that have the potential to affect the Ruby Placer and Tornado Claim (Figure 2). The avalanche paths which are currently unnamed are labeled as shown on Figure 2.





**Figure 2.** *Avalanche paths adjacent to the Ruby Placer and Tornado Claim. Black lines are avalanche paths. Black Arrows are potential avalanche paths. Scale in feet. Note that adjacent paths are not shown. Potential building sites chosen by the client are shown as yellow pushpins and are labeled T1, T2 and RP1. (Google Earth Image)*



### *3.4 Local Avalanche History*

Avalanche paths near the vicinity of the Ruby Placer and Tornado are shown on the INSTAAR avalanche hazard maps on the Silverton Quadrangle, 1976. The previously unnamed avalanche paths on the north of the subject property have reached CR 8 (Forest road 679) numerous times in the past including during the mid-January, 2017 avalanche cycle. We refer to them as the North Lookout Ridge, T1 and T2 avalanche paths on Figure 2. The avalanche paths to the south are previously unnamed. We refer to it as the Ruby Forest avalanche paths on Figure 2.

## **4.0 AVALANCHE HAZARD DISCUSSION**

We have provided a brief discussion of the observed conditions followed by a discussion regarding potential mitigation concepts for the observed avalanche hazard.

### *4.1 Local avalanche hazard.*

Average annual snowfall for the area near Silverton, Colorado is approximately 5 m (197 inches) per year (Western Regional Climate Center). The average settled snowpack depth in the vicinity of the site avalanche path is approximately 1.5 to 2.5 m (5 to 8 feet) although this depth can vary considerably.

The avalanche paths near the Ruby Placer and Tornado are defined in this study as shown on Figure 2. This was based on historic avalanche occurrences, potential impact pressures and snow flow heights modeled with the RAMMS avalanche dynamics model, and on dendrochronology of trees within the avalanche path. Details of these methods are discussed below:

### *4.2. Avalanche dynamics modeling with RAMMS*

We analyzed the potential for snow avalanches to occur on the slopes above the Ruby Placer and Tornado Claim using the Swiss RAMMS (Rapid Mass Movements Simulation) model. RAMMS is a two-dimensional, state-of-the-art numerical simulation model to calculate the motion of geophysical mass movements (ie. snow avalanches) from initiation to runout in three-dimensional terrain at the subject property (RAMMS User Manual v1.5). We utilized a Digital Elevation Model (DEM) and orthophotos of the site and surrounding terrain acquired from Digital Data Services (DDS) for the analysis.

RAMMS allows the user to input various snow slab heights for the avalanche release zone and to vary the friction parameters for forested regions within the avalanche path. We input the forested regions based on our site analysis in the field as well as utilizing the orthophotos from DDS and Google Earth images. We input the snow height release areas based on our field reconnaissance. We applied the Swiss default friction values for the avalanche paths in the study.

The predicted runout, flow heights, velocities and calculated impact pressures for a 100 year return period avalanche event from the RAMMS model are shown in the figures below.

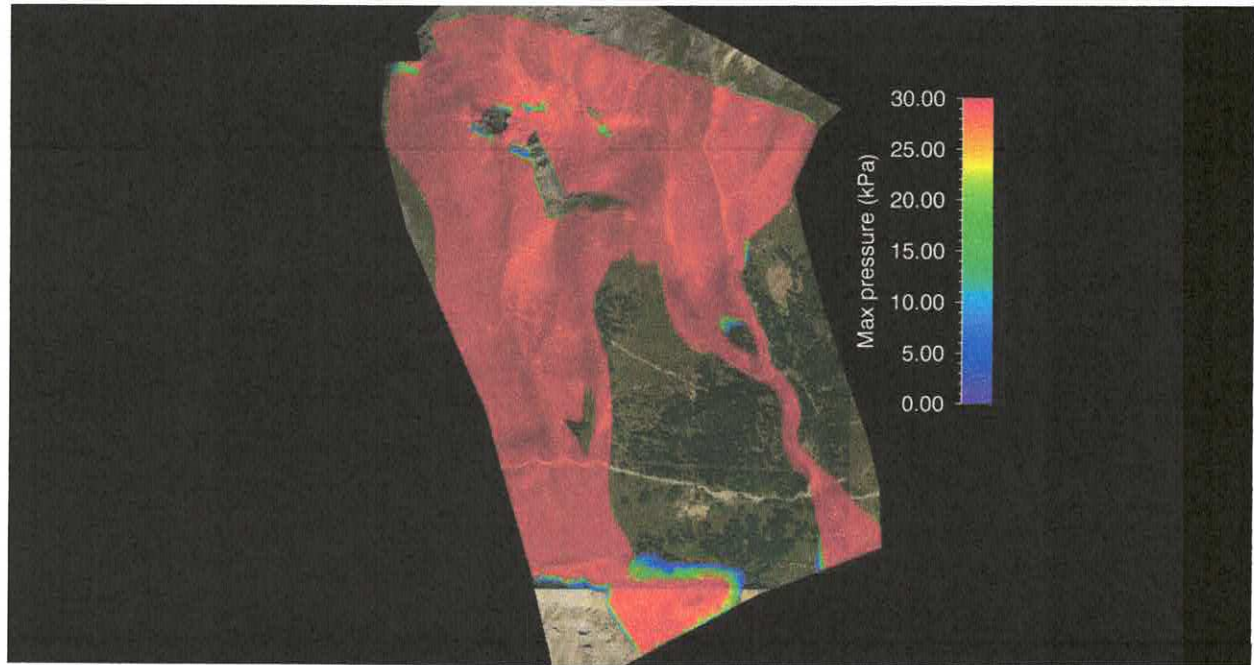
Parameters for the avalanche simulation were based on topographical and vegetative indicators within the avalanche path. Snow depth and density were based on NRCS SNOTEL data from the Red Mt Pass SNOTEL site and the Western Regional Climate Center data for Silverton. The average snow depth for the Ruby Placer and Tornado avalanche paths were interpolated between the two sites.

The predicted runout, flow heights, velocities and calculated impact pressures for a 100 year return period avalanche event from the RAMMS model are shown in the figures below.

It should be noted that the predicted runout zone from the RAMMS model does not show the potential cabin site for T2 in the calculated avalanche path. We have increased the size of the calculated avalanche runout zone from the RAMMS model due to our field observations, dendrochronological analysis, historic avalanche activity and our experience in the area. We utilized RAMMS to interpolate the impact pressures, velocity and snow height of the flowing avalanche debris at the potential cabin sites.

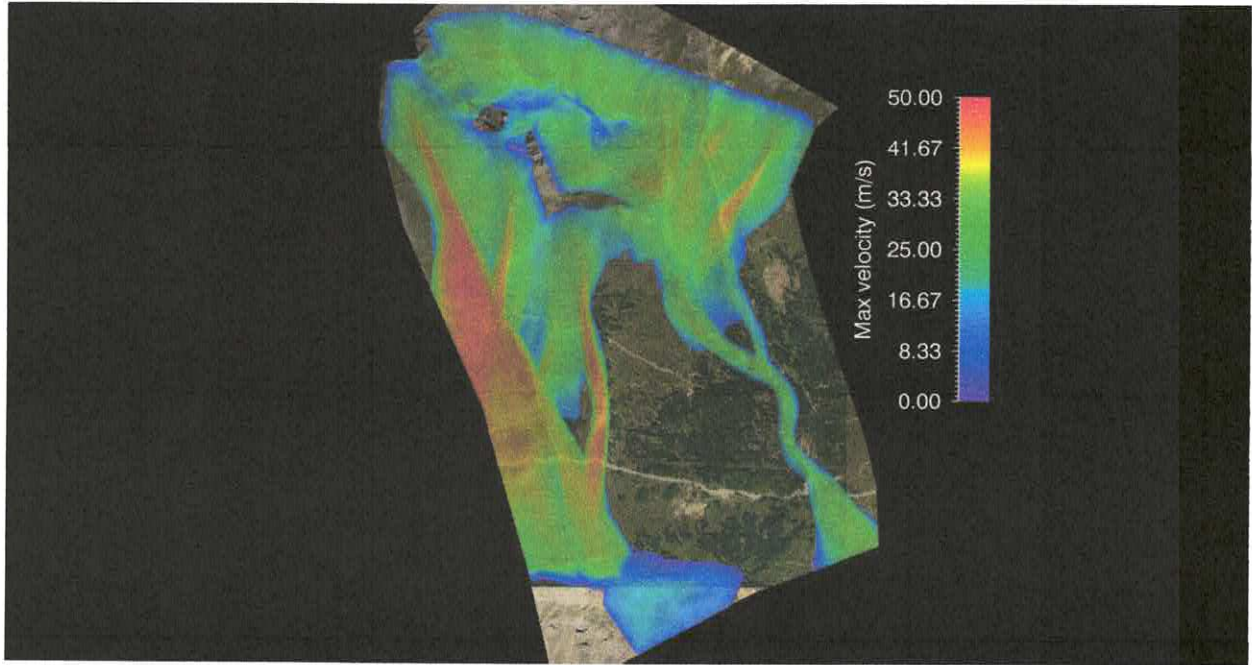
The calculated potential impact pressures from the design avalanche for the avalanche paths in the vicinity of the Ruby and Tornado claims are shown on Figure 3. The maximum calculated velocities for the design avalanche are shown on Figure 4. The maximum calculated snow heights are shown on Figure 5.





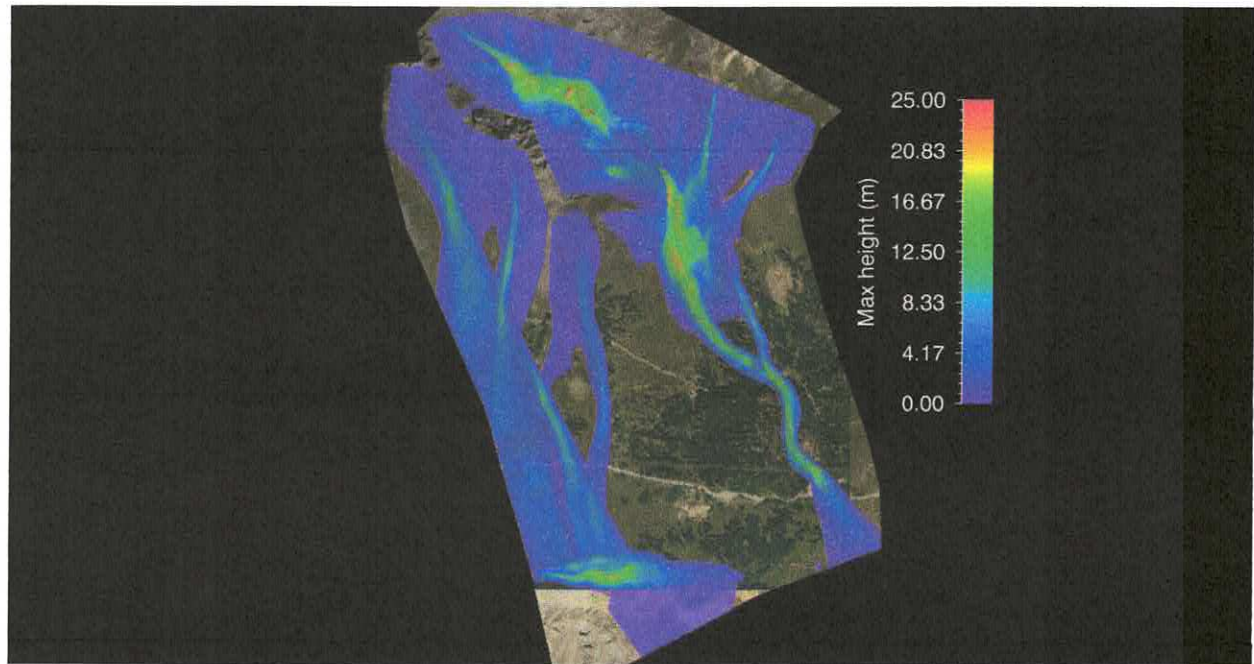
**Figure 3**

*Orthophoto of the avalanche paths in the vicinity of the Ruby and Tornado claims with modeled maximum impact pressures in color for a release with a 1.25 meter slab. The color bar indicates impact pressure in kiloPascals (kPa). Any area colored red has impact pressures great than 30kPa and is in the Red or High Hazard zone of the avalanche paths.*



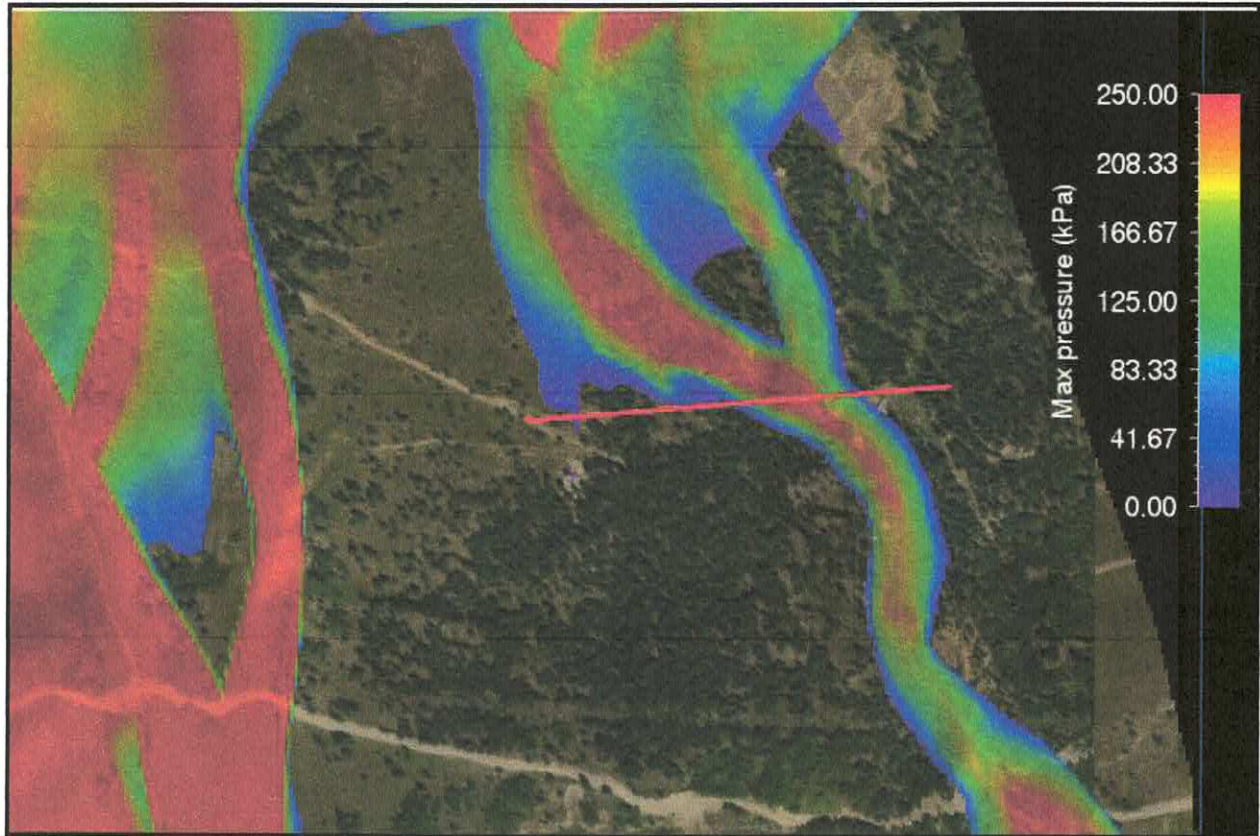
**Figure 4**

*Orthophoto of the avalanche paths in the vicinity of the Ruby and Tornado claims with modeled velocities for a release with a 1.25 meter slab. The color bar indicates velocity, scale is in meters/second.*



**Figure 5**  
*Orthophoto of the avalanche paths in the vicinity of the Ruby and Tornado claims with maximum flow height of snow for a release with a 1.25 meter slab. The color bar indicates height of avalanche debris. Scale is in meters.*





**Figure 6. Profile location for estimated impact pressures and snow heights from avalanche debris across the Tornado Claim. Red line indicates profile shown in Figure 7 and 8.**

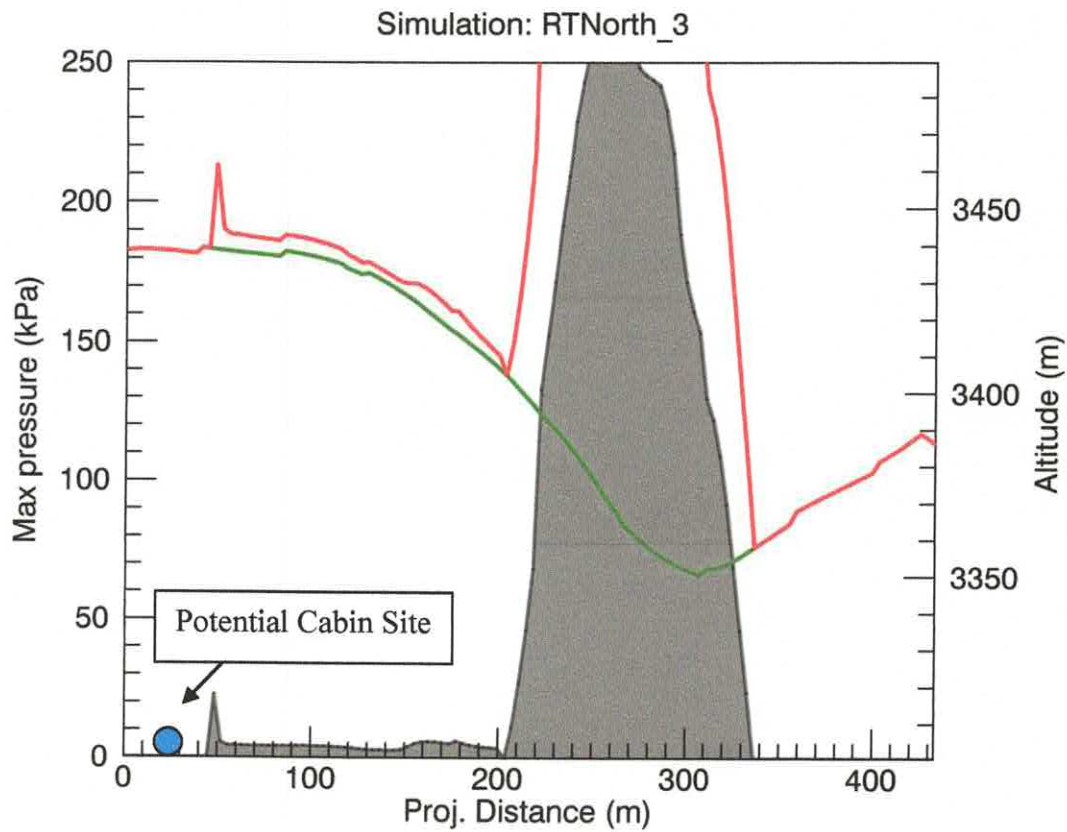


Figure 7. Profile of Maximum Impact Pressures in kPa across the Tornado claim along red line shown in Figure 6.

- Key to figure 7 and 8:- filled grey area active parameter (scale on left side).  
- red line active parameter (multiplied by 50) added to the track profile (altitude, scale on the right side).  
- green line track profile (altitude, scale on the right side).  
- bottom scale projected profile distance (in m).

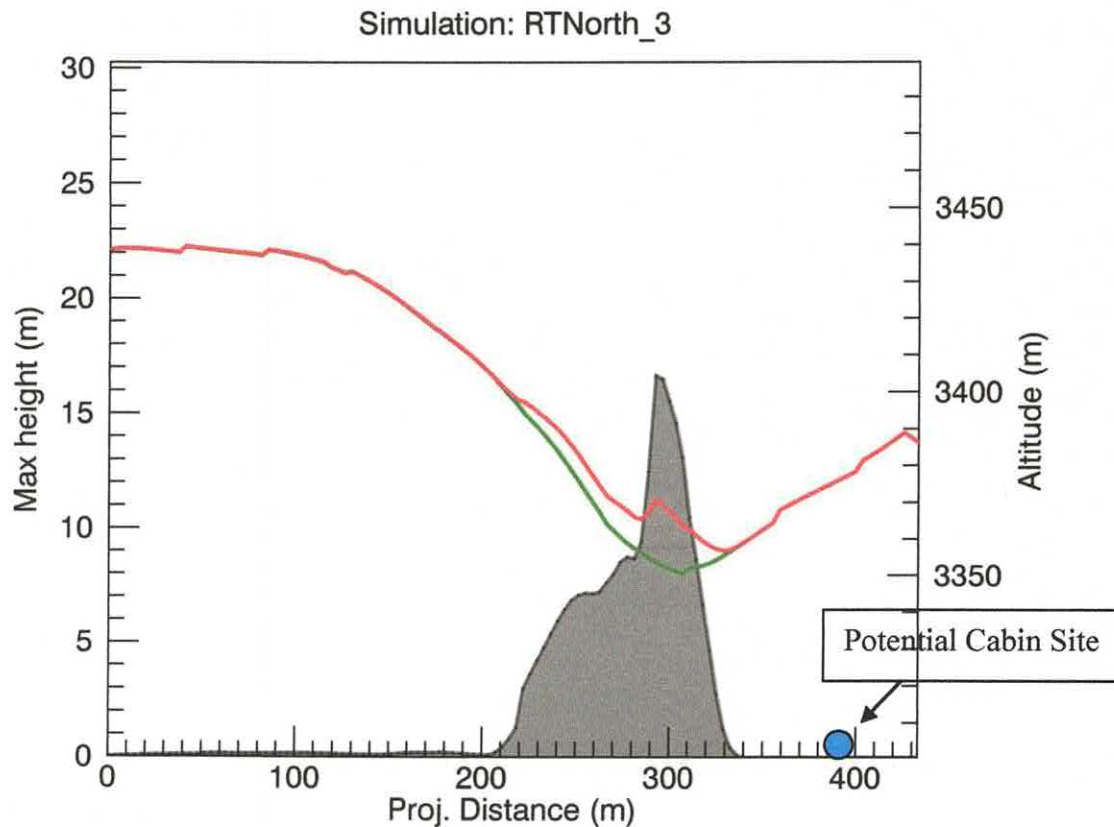


Figure 8. Maximum snow height from avalanche debris along profile shown in Figure 7.

We also modeled avalanches from the slopes on the south side of the Ruby Placer with RAMMS avalanche software. The Ruby Forest avalanche path affects the southern part of the Ruby Placer. The avalanche from the north (North Lookout Ridge path) affects the Ruby Placer site with higher impact pressures, velocities and snow depths than the smaller paths to the south. We are available to discuss these results if desired.

#### 4.3 Dendrochronology and Vegetative Indicators of Avalanche Frequency

Trees within and adjacent to the Ruby and Tornado claims were bored with an increment core to determine the age of the trees. Past avalanche activity can also be interpreted from increment cores and cross sections where the tree has been partially damaged from avalanches. Dendroecological techniques can provide a means for reliably dating avalanches and calculating frequency where sufficient woody vegetation exists for sampling (Jenkins and Hebertson, 2004).



Six trees were sampled with an increment core and numerous trees were inspected for flagging in or adjacent to the avalanches paths near the Long property. The locations are shown on Figure 9. The ages of the trees are shown in Table 1. Trees of similar diameters were noted in areas where samples were taken. Flagged trees have had the branches on the uphill side broken off by previous avalanche events.

Based on the dendrochronologic techniques used and the modeling methods described above, the avalanche paths were drawn as shown on Figure 2.



**Figure 9** Locations of dated trees near the Ruby Placer and Tornado Claim. Numbers correspond to Table 1. T1, T2 and RP 1 indicate areas where we analyzed the hazard at potential building sites.

**Table 1 Ages of trees near the Ruby Placer and Tornado, dated with increment bore.**

Location	Type of Tree	Approximate Age in years +/- 5yrs
1	Engelmann Spruce	87
2	Douglas Fir	120 (+/- 15 yrs)
3	Blue Spruce	95
4	Engelmann Spruce	136
5	Engelmann Spruce	108
6	Engelmann Spruce	27

#### *4.4 Avalanche Hazard to Potential Building Sites and Access at the Ruby Placer and Tornado Claim*

We consider that the proposed potential building sites T1, T2 and RP1 which were chosen by the client as shown on Figure 2 and Figure 9 have different degrees of avalanche hazard as outlined below based on the history of the path, size and damage to the trees above and on the site and the avalanche dynamics modeling we conducted.

Site T1 on the Tornado Claim, which we consider to be within about 150 feet of the existing mine building, is not located within an active avalanche path. There are avalanche paths close by the site in the deep gully to the west and in the avalanche path to the north as outlined in Figure 2. There may be other geotechnical issues associated with the building site due to the steep slopes in the vicinity, but these are not addressed in this report.

Site T2 on the Tornado Claim, which we consider to be near the existing mine dump below unnamed access road from the west, is located just below an active avalanche zone as shown on Figure 2. We therefore do not recommend site T2 as a building site due to the potential for an avalanche to reach the site. The area just southeast of site T2 may be feasible for a building site location as it is located outside of the avalanche path in the thicker timber to the southeast.

Any area that is outside of the avalanche paths shown on Figure 2 within the Tornado claim may be considered to have no avalanche hazard. It should be noted that the lines drawn on Figure 2 that represent avalanche paths should be interpreted to be the general location of the avalanche path. It is always prudent to have a buffer between the avalanche path location as shown on Figure 2 and the actual building site chosen for development to account for larger avalanche events than those modeled. There may be other geotechnical issues associated with the Tornado claim but they are not addressed in this report. Trautner Geotech is available to discuss a geotechnical engineering study if desired.



Site RP1 of the Ruby Placer has parts of the property that are within an avalanche path and could be considered to have significant avalanche hazard. We recommend that any building site be located at least 100 feet from the avalanche paths that reach the Ruby Placer shown on Figure 2 due to the large size of the avalanche path (North Lookout Ridge) that initiates to the north of the Ruby Placer.

The eastern part of the Ruby Placer is located outside of the avalanche hazard zone and may be suitable for a building site. There may be other geotechnical issues associated with the Ruby Placer but they are not addressed in this report. Trautner Geotech is available to discuss a geotechnical engineering study if desired.

The estimated impact pressures shown on the profile in Figures 7 and 8 are based on design avalanches which occur during extraordinary snowfall events and would produce avalanches capable of causing damage to any structure not protected by avalanche mitigation. These events would involve a large storm event coupled with a weak layer of snow on which the storm snow would fall. Normal snowfall amounts can produce avalanches on the subject property and caution should be taken when traveling on or near the slopes during or immediately after snowfall events or after snow accumulation due to wind.

San Juan County does permit some building in Blue zones, but requires avalanche mitigation. We must emphasize that the access roads and surrounding areas are crossed by large and frequent avalanche paths that can pose a serious threat during unstable snow conditions and during storm events. It would be prudent to check with the Colorado Avalanche Information Center daily avalanche bulletin prior to accessing the property during the winter season.

#### *4.5 Potential Avalanche Mitigation*

We feel that the best mitigation on these sites is avoidance of avalanche areas as outlined in Figure 2. On the Ruby Placer site we recommend a further buffer away from the modeled avalanche paths as shown in Figure 2 due to the large size of the avalanche path that can affect the Ruby Placer site.

Site-specific avalanche mitigation design is beyond the scope of this study, but there are typically two possible mitigation strategies for the potential building sites in the Blue or Moderate Hazard avalanche zones; direct protection or an avalanche deflecting berm. Direct protection for a structure includes engineering the structure to withstand the estimated impact pressures. This usually involves a concrete barrier along the bottom of the structure with the angle of the walls designed to lessen the impact pressures from the avalanche debris and powder blast. Direct protection avalanche mitigation can increase the cost of a structure by about 20%.

An avalanche deflecting berm usually includes an engineered MSE (Mechanically Stabilized Earth) or GRE (Geotextile Reinforced Earth) type earthen berm that would mitigate the hazard to building envelope of the potential building site. Avalanche deflecting berms are earthen berms designed to intercept and deflect avalanches at a small angle to their natural flow direction and

divert snow away from the objects to be protected (Mears, 1992). Avalanche deflecting berms are cost effective but avalanche deposits tend to backfill berms in cases when more than two avalanches per season are expected to reach the berm. When an avalanche reaches the berm and deposits snow on the uphill side of the berm, it reduces the effective height of the berm and can allow subsequent avalanches to overrun the berm (Mears, 1992). These type of structures can be cost effective if there is extra soil material left over from the foundation excavation.

Although we recommend that any building envelope be located outside of the avalanche zones shown on Figure 2, if desired, design of mitigation features or structures should be conducted by a structural engineer familiar with avalanche structures as part of the continued design development of this project. These mitigation concepts do not apply to other areas on the Ruby Placer and Tornado Claim property.

## 5.0 CONCLUSION

The information presented in this report is based on our surface observations, a review of available literature, avalanche mapping for the area, dendrochronology, and avalanche dynamics modeling and on our experience in the area. We recommend that we be contacted and included in future design phases and development of this project to provide engineering geology and avalanche hazard mitigation consultation. Please contact us immediately if you have any questions, or if any of the information presented above is not appropriate for the proposed site development.

Trautner Geotech does not provide general civil engineering, or structural engineering consultation. The information in this report should be shown to a competent structural engineer familiar with avalanches so that they may incorporate the estimated impact pressures into any future structure design planned for the property.

The information presented in this letter is applicable only for the Ruby Placer and Tornado Claim near Silverton, Colorado and is based on our surface observations, avalanche history, dendro-chronological tree ring analysis, avalanche dynamics modeling and on our experience in the area. We recommend that we be contacted and included in future design phases and development of this project to provide engineering geology and avalanche hazard mitigation consultation. Please contact us immediately if you have any questions, or if any of the information presented above is not appropriate for the proposed site development.

The avalanche hazard observations presented above are not suitable for adjacent project sites, or for a proposed scope of development which is different than that outlined for this study.

Avalanche hazard can vary depending on a number of factors including but not limited to; snow pack height, snow layer type, wind speed and direction, and meteorological factors before, during and after a storm cycle. We provide an estimate of the potential hazards of a design avalanche for the subject avalanche path, but extraordinary snow or weather phenomena can produce unexpected avalanches in areas that have no evidence of previous avalanche activity.



We are available to review and tailor our study, if needed, as the project progresses and additional information which may influence our evaluation of the site becomes available. Design and feasibility level geotechnical engineering studies of the site will help develop subsurface soil and water information that may be pertinent to roadway and foundation design. Please contact us to establish a scope of service for design phase geotechnical engineering consultation studies and construction phase materials testing services.

Please contact us if you have any questions, or if we may be of additional service.

Respectfully submitted,  
TRAUTNER GEOTECH LLC

Reviewed by

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## References

Mears, A. I., 1992, Snow Avalanche Hazard Analysis for Land Use Planning and Engineering, Colorado Geological Survey, Bulletin 49, Dept. of Natural Resources, Denver, CO.

Jenkins, M. J., and Hebertson, E. G., 2004, A Practitioner's Guide for Using Dendro-Ecological Techniques to Determine the Extent and Frequency of Avalanches, International Snow Science Workshop, p. 423, Jackson, WY, 2004.