Application for Improvement Permit

Proposed Collins Residence

Hwy 550 San Juan County, Colorado
(Greyrock Village North)
37.62 Acres Located in Section 13
Township 39 North, Range 9 West

Applicant:
OZONE CUBED CO, LLC
403 Corporate Wood Drive
Magnolia, TX 77354

Prepared By:
Michal Valencia, P.E.
Site Development Solutions, LLC
PO Box 997
Bayfield, CO 81122
Ph: 970-749-6767

Aaron Mills
McCarty Excavation & Construction
17448 CR 501
Bayfield, CO 81122
Ph: 970-426-9887

Application for Improvement Permit

Proposed Collins Residence

Hwy 550 San Juan County, Colorado
(Greyrock Village North)
37.62 Acres located in Section 23
Township 39 North, Range 9 West

Applicant:
OZONE CUBED CO, LLC
403 Corporate Wood Drive
Magnolia, TX 77354

Prepared By:
Michel Valenda, P.E.
Site Development Solutions, LLC
PO Box 997
Bayfield, CO 81122
Ph: 970-759-8161

Aaron Mills
Site Survey Solutions & Topography
17443 CR 320
Bayfield, CO 81122
Ph: 970-759-9827

Collins Residence
Ozone Cubed CO, LLC

January 3, 2022

Attn: Lisa Adair P.E., Planning Director
1360 Greene St
Silverton, CO 81433

Subject: Application for Land Improvement Permit - Plan Review

Proposed Collins Residence, located at *TBD* Hwy 550 San Juan County, Colorado aka "Greyrock Village North" is a 37.62 Acres Homesite Located in Section 13 Township 39 North, Range 9 West. The Southern Property line and the San Juan County line are one in the same; hence from the SJ county line North and to the West of Hwy 550 is where the property lies.

Dear, Lisa Adair and San Juan County Commissioners,

This submittal has been prepared to describe the proposed single-family residence and improvements to the aforementioned property. This property is zoned "Rural Residential" as shown on the San Juan County Zoning and Land Use District Map. It is part of the Durango Mountain Resort Master Plan. The property is entirely located in San Juan County. It is desired to build a new single-family residence on this property. We have put together a project team more than capable of producing a home that meets and exceeds all San Juan County requirements. The architectural design of this home is often referred to as "Mountain Modern" and is referenced often when building in locations such as this in order to produce a home that works with and looks good in this type of mountainous setting. We believe this project/home will be a beautiful use of this wonderful property and compliment the surrounding properties including the ski area.

The attached documents have been prepared for a San Juan County Land Improvement Permit Plan Review. The applicant requests review of this project by the County Commissioners at the next available meeting.

Should there be any questions or concerns we encourage you to reach out to our project team for answers and/or resolutions. We appreciate your time and consideration regarding this land improvement permit.

Best Regards,

McCarty Excavation & Construction

Proposed Collins Residence

Greyrock Village North

Project Narrative & Project Contacts

Applicant Name: Ozone Cubed CO, LLC

Project Location:
This project is located on 37.62 acres in Section 13, Township 39 North, Range 9 West in San Juan County, Colorado.
The property is referred to as Greyrock North as indicated on the Durango Mountain Resort Master Plan dated March 1, 2002; Revised July 21, 2003 and recorded by the State of Colorado & San Juan County on August 21, 2003. (Reception Number: 142807).

Legal Description:
Portion of T39N R9W SEC 13 Lying West of Hwy 550: SW1/4NE1/4, W1/2SE1/4

Proposed Development:
We are proposing to construct one custom single-family residence. Included with construction will be a new driveway, and septic system.

Home Size:
The proposed home consists of a two-story residence with a 3-car garage. The home will have six bedrooms and eight bathrooms. The home will also have an office and gym.
The first floor will consist of 3,892 sf, and the second floor will consist of 2,442 sf. The garage will be 868 sf. The overall height of the home at its highest point is 30' from finish grade. There will be front and rear 1st floor exterior covered living space, along with 2nd story decks/outdoor living space.

Zoning:
The property is zoned Rural Residential as indicated on the San Juan County Zoning and Land Use Map adopted July 6, 1993. See attached map with approximate location of the property.

Access:
The property will be accessed from Hwy 550 via a new driveway as shown on the site plan. A State Highway Access Permit Application has been submitted to CDOT and is currently under review. A new address will be assigned to this parcel as the Land Improvement Permit process progresses.

Proposed Collins Residence
Greyrock Village North

Project Narrative & Project Contacts

Applicant Name: Ozone Cubed CO, LLC

Project Location:

This project is located on 37.62 acres in Section 13, Township 39 North, Range 9 West in San Juan County, Colorado.

The property is referred to as "Greyrock North as indicated on the Durango Mountain Resort Master Plan dated March 1, 2003, Revised July 21, 2003 and approved by the State of Colorado & San Juan County on August 21, 2003. (Reception Number 174207).

Legal Description:

Portion of T39N R9W Sec 13 lying West of Hwy 550: SW1/4NE1/4, W1/2SE1/4

Proposed Development:

We are proposing to construct one custom single-family residence. Included with construction will be a new driveway and septic system.

Home Size:

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The first floor will consist of 3,892 sf, and the second floor will consist of 2,442 sf. The garage will be 866 sf. The overall height of the home at its highest point is 30' from finish grade. There will be front and rear 1st floor exterior covered living space, along with 2nd story deck/outdoor living space.

Zoning:

The property is zoned Rural Residential as indicated on the San Juan County Zoning and Land Use Map adopted July 9, 1993. See attached map with approximate location of the property.

Access:

The property will be accessed from Hwy 550 via a new driveway as shown on the site plan. A State Highway Access Permit Application has been submitted to CDOT and is currently under review. A new address will be assigned to this parcel as the Land Improvement Permit process progresses.

General Contractor:
McCarty Excavation and Construction
17448 CR 501
Bayfield, CO 81122
Ph: 970-749-6767
Email: mccartyexcavation@msn.com

Civil Engineer:
Michal Valencia, P.E.
Site Development Solutions, LLC
970-749-6767
Mikie.sds@gmail.com

Architectural Plans:
The architectural plans for this project are being completed by:
Mariah Eldred
Ori Design Studio, LLC
970-946-2884
oriirodesign@msn.com

Structural Plans & Foundation:
The structural plans and foundation plans for this project are being completed by:
Garth Glasco, P.E., S.E.
GOFF Engineering & Surveying Inc.
970-247-1705
gglasco@goffengineering.com

Geotechnical Report & Subsurface Conditions:
Please reference the Geotechnical Engineering Feasibility and Geologic Hazard Study created by Lambert and Associates for Purgatory/Durango Mountain Resort Master Plan dated August 18, 2000

Surveying:
The original survey for this property was completed on 10-26-17 by:
Moreno Surveying & Geographics
970-385-8535

Construction surveying and staking will be completed by:
GOFF Engineering & Surveying or other qualified party.

Collins Residence
Dove Creek CO, LLC

General Contractor:
McCarty Excavation and Construction
17744 CR 502
Bayfield, CO 81122
Ph: 970-749-6767
Email: mccartyexcavation@msn.com

Civil Engineer:
Michal Valencia, P.E.
Site Development Solutions, LLC
970 749-6767
Mikie.sds@gmail.com

Architectural Plans:
The architectural plans for this project are being completed by:
Mariah Eldred
Oh! Design Studio, LLC
970-946-2884
ohlittledesign@msn.com

Structural Plans & Foundation:
The structural plans and foundation plans for this project are being completed by:
Garth Blasco, P.E., S.E.
GGPE Engineering & Surveying Inc
970-247-1705
gblasco@ggtengineering.com

Geotechnical Report & Subsurface Conditions:
Please reference the Geotechnical Engineering Feasibility and Geologic Hazard Study created by Lambert and Associates for Rogers/Dry/Durango Mountain Resort Master Plan dated August 18, 2000

Surveying:
The original survey for this property was completed on 10-26-17 by:
Morrone Surveying & Cartographics
970-385-8515

Construction surveying and staking will be completed by:
GGPE Engineering & Surveying or other qualified party.

Building Envelope:
The building envelope is located on a level clearing below a cliff near the west property line. All setbacks as required by San Juan County and shown on the site plan will be adhered to.

Utilities:
Water: A new well will be installed on property at the location recommended by DAK drilling. Well location will be coordinated with Site Development Solutions so that all appropriate setbacks and requirements are met.

Sewer: A new septic system shall be installed as shown on the septic design provided by Site Development Solutions LLC, with location shown on the proposed site plan.

Power: Power to the property and home will be provided by La Plata Electric Association. Load calculations and requirements for electricity will be performed by Phillips Electric.

Propane: A new propane tank will be installed in a permanent location at an appropriate distance from the residence.

Heating:
The heating for this residence will be provided by a forced air heat system designed by Annadel Building Solutions. Owner Mike Frisoni is RESNET certified and along with designing the heating system he will also be providing a Manual J report which calculates the heat/cooling load of the home and a Manual D report that indicates zones and required duct sizing to provide a balanced HVAC system throughout the residence.

Landscaping:
Landscaping is to consist of raking and removal of combustible ground cover around the home, as recommended by the Colorado State Forest Service Firewise Practices, to develop adequate defensible space. Revegetation and screening will be provided by the general contractor in accordance with the requirements of San Juan County.

Exterior Lighting:
Exterior lighting will include automatic motion sensing lights as deemed appropriate for security, appropriate entry lighting, and accent/landscape lighting. Exterior lighting will be in conformance with the requirements of San Juan County.

San Juan County Geo Hazards Map

The location of this project has been roughly drawn onto the official San Juan County Geo Hazards Map. Further exploration of the known Geo Hazards is addressed in the Geotechnical Engineering Feasibility and Geologic Hazard Study provided. Reference Mitigation/Assessment Sections 5.2.1 (seismic effects), 5.3.1 (land subsidence), 5.4.1 (landslides), and 5.5.1 (avalanches), 5.6.1 (rockfall), 5.7.1 (flooding), 5.8.1 (mudflow and debris fans), 5.9.1 (expansive soil and rock), 5.10.1 (Slopes). There is NO mitigation required for any of these geo hazards.

San Juan County Avalanche Hazards Map

The location of this project has been roughly drawn onto the official San Juan County Avalanche Hazards Map. Further exploration of the known Avalanche Hazards is addressed in the Geotechnical Engineering Feasibility and Geologic Hazard Study provided. Reference Section 5.5 on page 13, in short it states "no evidence of existing or historic avalanche activity was observed"

Wetlands Impacts and Existing Permit

The wetlands on the property were previously delineated and permitted with the Army Corps of Engineers. The impacts were estimated for the future development of the parcel. The development of the parcel as proposed will have less wetlands impacts and therefore only require a staff review by the Army Corps of Engineers.

Thank you for your review and consideration of this proposed residence. If you have any questions, concerns, or need further information please contact Aaron Mills of McCarty Excavation & Construction at 970-426-9887 or Michal Valencia of Site Development Solutions at 970-749-6767

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San Joan County, Colorado

Application for Improvement Permit

Applicant
Name: Michal Valencia
Address: PO Box 997
Bayfield, CO 81122 970-749-6767 Phone

Owner
Name: Ozone Cubed CO, LLC
Address: 403 Corporate Wood Dr.
Magnolia, TX 77354 Phone

Contractor
Name: McCarty Excavation & Construction, Inc.
Address: 17448 CR 501
Bayfield, CO 81122 970-759-2804 Phone

Legal Description of Property:

Portions of the following described property in Township 39 North, Range 9 West, N.M. P.M., San Juan County, Colorado, lying and being west of U.S. Hwy 550;
Section 13: SW 1/4 NE 1/4 and W1/2 SE1/4

Township N, Range W, Section

Nature of Improvement Planned: Single family residence

Land Use Zone: Rural residential

Applicant Signature

Michal Valencia

Date Application Requested			
Date Submitted for Permit			
Date Permit Issued			
Date Permit Denied			

Reason for Denial

Receipt	FEE PAYMENT	Amount	Date
	Application		
	Building Permit		
	Subdivision/PUD		
	Hearing Notice		

APPROVAL CHECKLIST	Initial	Date
Land Use Administrator		
Ownership of Surface		
Ownership of Minerals		
Vicinity Map		
Certified Survey Plat		
Monumentation		
Basic Plan Map		
Plans and Drawings		
Road System Relationship		
Zoning Compatibility		
State Mining Permit		
Owner Notification		
Avalanche Hazard		
Geologic Hazard		
Floodplain Hazard		
Wildfire Hazard		
Mineral Resource Impact		
Wildlife Impact		
Historic Site Impact		
Watershed Gearance		
County Building Inspector		
Building Permit		
State Electrical Inspector		
Electrical Permit		
San Juan Basin Health Unit		
Sewage Disposal: Test		
Design		
Central Sewage Collection		
State Division of Water Resources		
Adequate Water Source		
Well Permit		
. Central Water Distribution		
U.S. Forest Service/BLM		
Access Approval		
State Division of Highways		
Driveway Permit		
Subdivision Variance		
Subdivision Approval		
PUD Approval		

Application for Improvement Permit

State Documentary Fee
$82.50 05-18-2021

153548
Page 1 of 1
SAN JUAN COUNTY, COLORADO
LADONNA L. JARAMILLO, RECORDER
05-18-2021 03:56 PM Recording Fee $13.00

SPECIAL WARRANTY DEED

THIS DEED, Made this 18th Day of May, 2021

Between PURGATORY VILLAGE LAND, LLC, A COLORADO LIMITED LIABILITY COMPANY

of the County of La Plata and State of Colorado, grantor

and OZONE CUBED CO, LLC, A COLORADO LIMITED LIABILTY COMPANY

whose legal address is 403 Corporate Wood Drive
Magnolia, TX 77354

of the County of Montgomery and State of Texas, grantee

State Document Fee
Date: 5.18.21
$ 82.50

WITNESSETH, That the grantor for and in consideration of the sum of
----------TEN DOLLARS AND OTHER GOOD AND VALUABLE CONSIDERATION----------
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, its successors 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:

Those portions of the following described property located in Township 39 North, Range 9 West, N.M.P.M., San Juan County, Colorado, lying and being West of U. S. Highway 550;

Section 13: SW1/4NE1/4 and W1/2SE1/4

As known by street and number as: TBD Hwy 550
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 grantee, its successors and assigns forever. The grantor, for itself, its successors does covenant, and agree that the grantor shall and will WARRANT AND FOREVER DEFEND the above bargained premises in the quiet and peaceable possession of the grantee, its successors and assigns, against all and every person or persons lawfully claiming the whole or any part thereof, by, through or under the grantor, except: 2021 taxes due and payable in the year 2022. Subject to Statutory Exceptions as defined in CRS § 38-30-113(5).

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.

PURGATORY VILLAGE LAND, LLC, A COLORADO LIMITED LIABILITY COMPANY

BY: GARY S. DERCK, MANAGER

STATE OF ARIZONA

COUNTY OF MARICOPA

The foregoing instrument was acknowledged before me this 14th Day of May, 2021

By: GARY S. DERCK AS MANAGER OF PURGATORY VILLAGE LAND, LLC, A COLORADO LIMITED LIABILITY COMPANY

My commission expires: 10/03/2023

Witness my hand and official seal

Notary Public

FRANKLIN WHITAKER
Notary Public - State of Arizona
MARICOPA COUNTY
Commission # 571137
Expires October 3, 2023

SJ22101956E

San Juan County Colorado Property and Maps

ccount #R5950
US HIGHWAY 550 N, DURANGO, CO 81301

OVERVIEW

KEY INFORMATION

Account #	**R5950**
Name(s)	**OZONE CUBED LLC**
Mailing Address	**403 CORPORATE WOOD DR MAGNOLIA TX 77354-2758**
Situs Address	**US HIGHWAY 550 N, DURANGO, CO 81301**
Total Acres	**37.62**
Section	**13**
Tax District	**103**
Plat Reference	-
Legal Description	**PORTION OF T39N R9W SEC 13 LYING WEST OF HIGHWAY 550: SW1/4NE1/4, W1/2SE1/4**

VALUE INFORMATION

Land	
Improvement	
Total	

IMPROVEMENTS

No data to display

LAND DETAILS

DESCRIPTION	EFFECTIVE ACRES*	EFFECTIVE SQ FT*	VALUE
Vacant	37.62	1,638,727	$1,637,22

Accounting for undivided interests and mixed use properties calculate smaller than the full property size.

TRANSFER HISTORY

OVERVIEW

KEY INFORMATION

Account #	R5950
Name(s)	OZONE OMEGA LLC
Mailing Address	403 CORPORATE WOOD DR MAGNOLIA TX 77354-2742
Situs Address	US HIGHWAY 550 N, DURANGO, CO 81301
Total Acres	37.62
Section	13
Tax District	103
Plat Reference	-
Legal Description	PORTION OF T35N R5W SEC 13 LYING WEST OF HIGHWAY 550; SW1/4NE1/4, W1/2SE1/4

VALUE INFORMATION

Land	
Improvement	
Total	

IMPROVEMENTS

No data to display

LAND DETAILS

DESCRIPTION	EFFECTIVE ACRES*	EFFECTIVE SQ FT*	VALUE
Vacant	37.62	1,638,727	$1,637,62

*Accounting for undivided interests and mixed use properties calculate smaller than the full property size

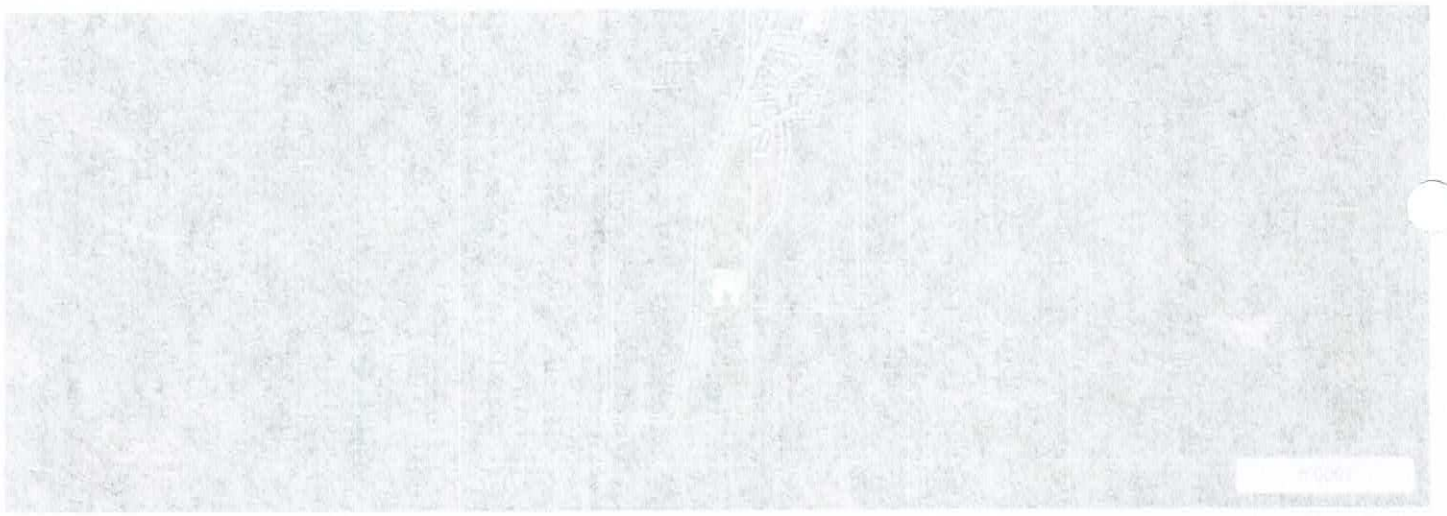
TRANSFER HISTORY

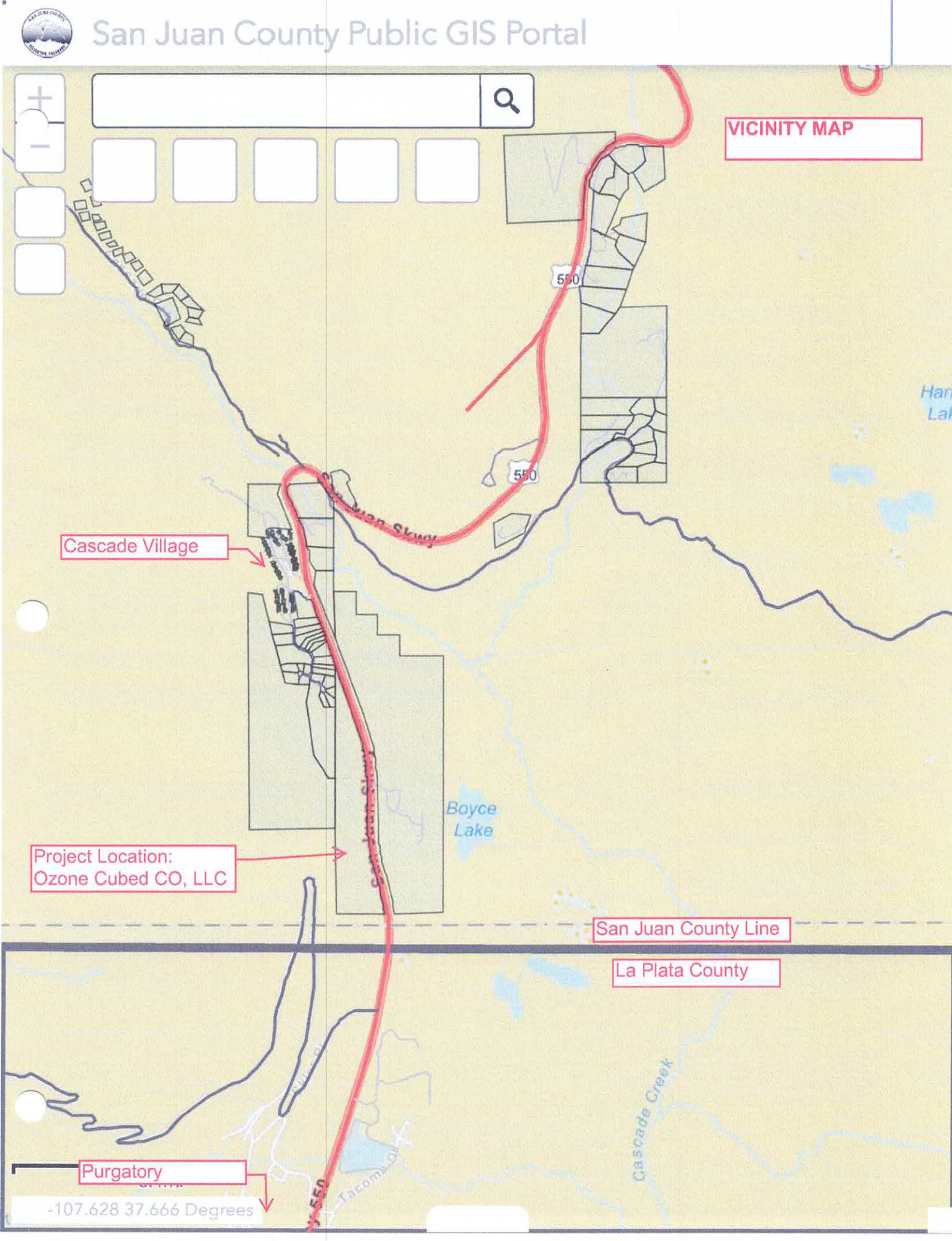
SALE DATE	AMT	RECEPTION	TYPE	GRANTEES	GRANTORS
05/14/2021	$825,000	153548	Special Warranty Deed(SWD)	OZONE CUBED LLC	PURGATORY VILLAGE LAN
01/04/2021	$0	153297	Bargain & Sale Deed(BSD)	PURGATORY VILLAGE LAND, LLC	DURANGO MOUNTAIN HOL
10/26/2017	$0	151432	Plat Map(PL)	JM BOYCE LAKE HOLDINGS LLC c/o:
 DURANGO MOUNTA LLC |

MINING CLAIMS

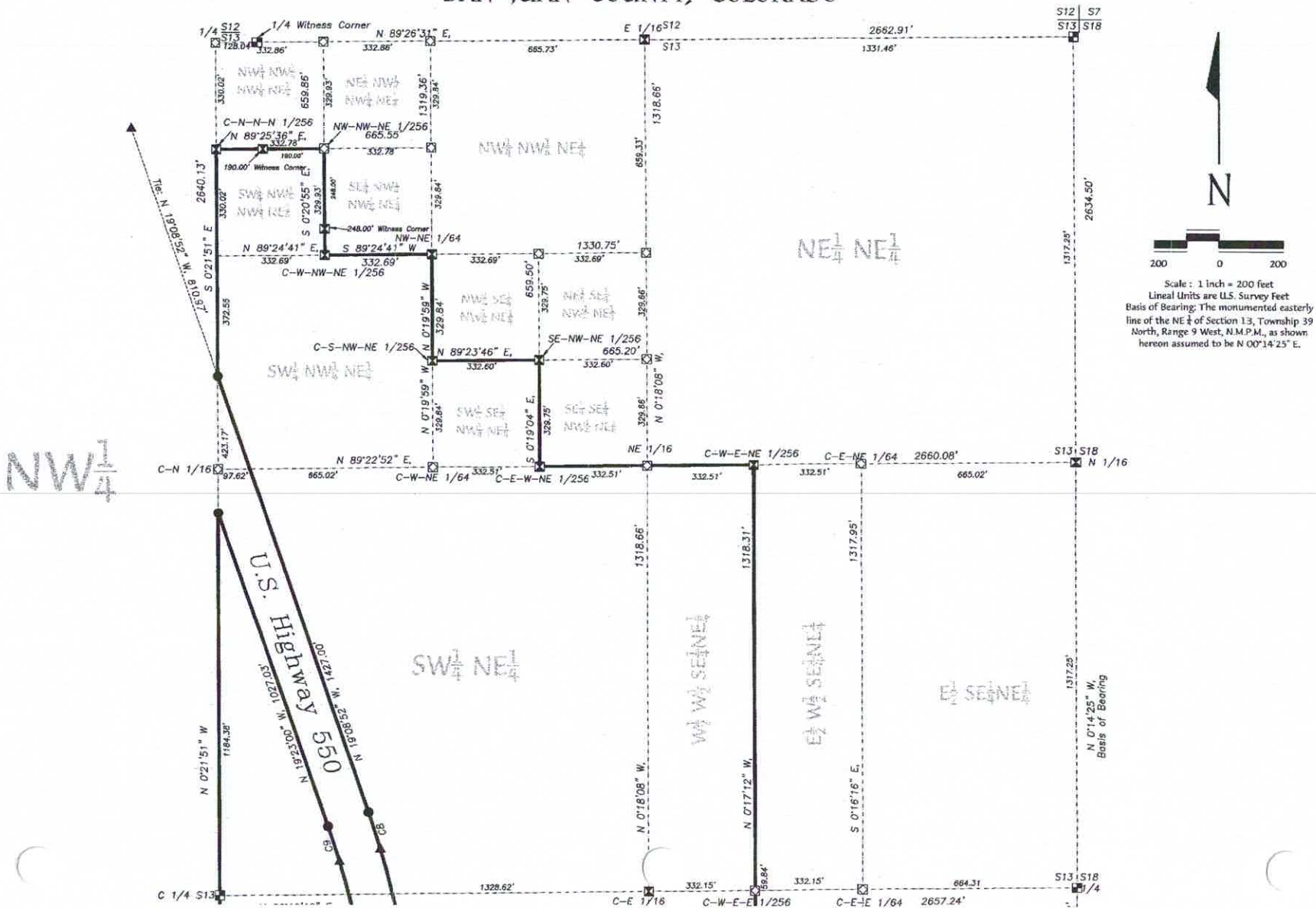
	CLAIM NAME	MINERAL SURVEY #
+	-	0

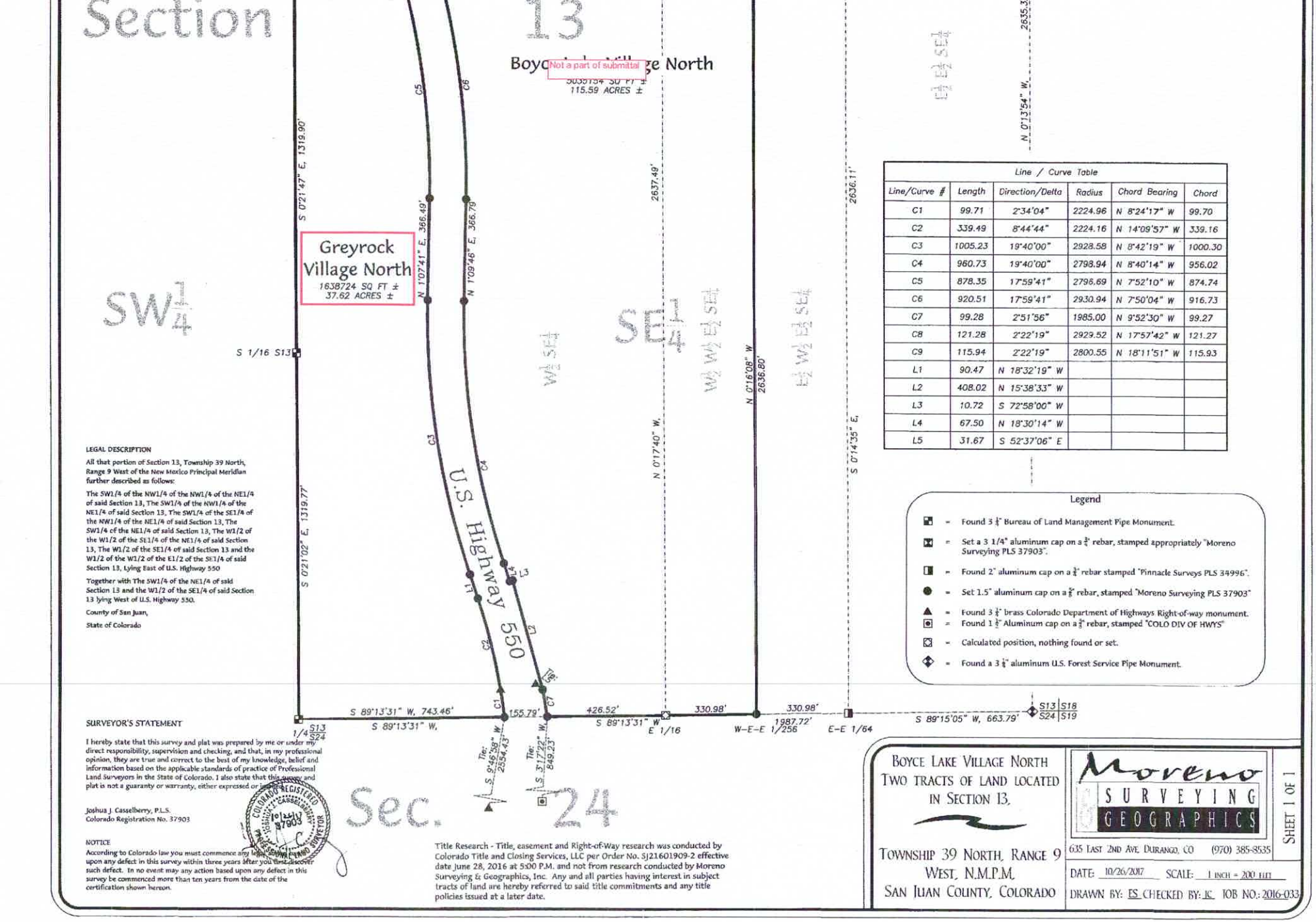
Acres	**38.31**
District	-
Mapping Status	-
Waste	-




San Juan County Public GIS Portal
VICINITY MAP
550
550
San Juan Skyway
Cascade Village
Boyce Lake
Project Location:
Ozone Cubed CO, LLC
San Juan County Line
La Plata County
Cascade Creek
Purgatory
-107.628 37.666 Degrees

BOYCE LAKE VILLAGE NORTH
TWO TRACTS OF LAND LOCATED IN SECTION 13, TOWNSHIP 39 NORTH, RANGE 9 WEST, N.M.P.M., SAN JUAN COUNTY, COLORADO





Line / Curve Table					
Line/Curve #	Length	Direction/Delta	Radius	Chord Bearing	Chord
C1	99.71	2°34'04"	2224.96	N 8°24'17" W	99.70
C2	339.49	8°44'44"	2224.16	N 14°09'57" W	339.16
C3	1005.23	19°40'00"	2928.58	N 8°42'19" W	1000.30
C4	960.73	19°40'00"	2798.94	N 8°40'14" W	956.02
C5	878.35	17°59'41"	2796.69	N 7°52'10" W	874.74
C6	920.51	17°59'41"	2930.94	N 7°50'04" W	916.73
C7	99.28	2°51'56"	1985.00	N 9°52'30" W	99.27
C8	121.28	2°22'19"	2929.52	N 17°57'42" W	121.27
C9	115.94	2°22'19"	2800.55	N 18°11'51" W	115.93
L1	90.47	N 18°32'19" W			
L2	408.02	N 15°38'33" W			
L3	10.72	S 72°58'00" W			
L4	67.50	N 18°30'14" W			
L5	31.67	S 52°37'06" E			

Legend

- ■ = Found 3 ¼" Bureau of Land Management Pipe Monument.
- ⊠ = Set a 3 1/4" aluminum cap on a ⅝" rebar, stamped appropriately "Moreno Surveying PLS 37903".
- ◧ = Found 2" aluminum cap on a ½" rebar stamped "Pinnacle Surveys PLS 34996".
- ● = Set 1.5" aluminum cap on a ⅝" rebar, stamped "Moreno Surveying PLS 37903"
- ▲ = Found 3 ¼" brass Colorado Department of Highways Right-of-way monument.
- ⊙ = Found 1 ½" Aluminum cap on a ⅜" rebar, stamped "COLO DIV OF HWYS"
- ⊠ = Calculated position, nothing found or set.
- ◆ = Found a 3 ¼" aluminum U.S. Forest Service Pipe Monument.

LEGAL DESCRIPTION

All that portion of Section 13, Township 39 North, Range 9 West of the New Mexico Principal Meridian further described as follows:

The SW1/4 of the NW1/4 of the NW1/4 of the NE1/4 of said Section 13, The SW1/4 of the NW1/4 of the NE1/4 of said Section 13, The SW1/4 of the SE1/4 of the NW1/4 of the NE1/4 of said Section 13, The SW1/4 of the NE1/4 of said Section 13, The W1/2 of the W1/2 of the SE1/4 of the NE1/4 of said Section 13, The W1/2 of the SE1/4 of said Section 13 and the W1/2 of the W1/2 of the E1/2 of the SE1/4 of said Section 13, Lying East of U.S. Highway 550

Together with The SW1/4 of the NE1/4 of said Section 13 and the W1/2 of the SE1/4 of said Section 13 lying West of U.S. Highway 550.

County of San Juan,

State of Colorado

SURVEYOR'S STATEMENT

I hereby state that this survey and plat was prepared by me or under my direct responsibility, supervision and checking, and that, in my professional opinion, they are true and correct to the best of my knowledge, belief and information based on the applicable standards of practice of Professional Land Surveyors in the State of Colorado. I also state that this survey and plat is not a guaranty or warranty, either expressed or implied.

Joshua J. Casselberry, P.L.S.
Colorado Registration No. 37903

COLORADO REGISTERED CASSELBERRY 37903 PROFESSIONAL LAND SURVEYOR

NOTICE

According to Colorado law you must commence any legal action based upon any defect in this survey within three years after you first discover such defect. In no event may any action based upon any defect in this survey be commenced more than ten years from the date of the certification shown hereon.

Title Research - Title, easement and Right-of-Way research was conducted by Colorado Title and Closing Services, LLC per Order No. SJ21601909-2 effective date June 28, 2016 at 5:00 P.M. and not from research conducted by Moreno Surveying & Geographics, Inc. Any and all parties having interest in subject tracts of land are hereby referred to said title commitments and any title policies issued at a later date.

BOYCE LAKE VILLAGE NORTH
TWO TRACTS OF LAND LOCATED IN SECTION 13,
TOWNSHIP 39 NORTH, RANGE 9 WEST, N.M.P.M.
SAN JUAN COUNTY, COLORADO

Moreno SURVEYING GEOGRAPHICS
635 East 2nd Ave, Durango, CO (970) 385-8535

DATE: 10/26/2017 SCALE: 1 INCH = 200 FEET
DRAWN BY: ES CHECKED BY: JC JOB NO.: 2016-033

SHEET 1 OF 1

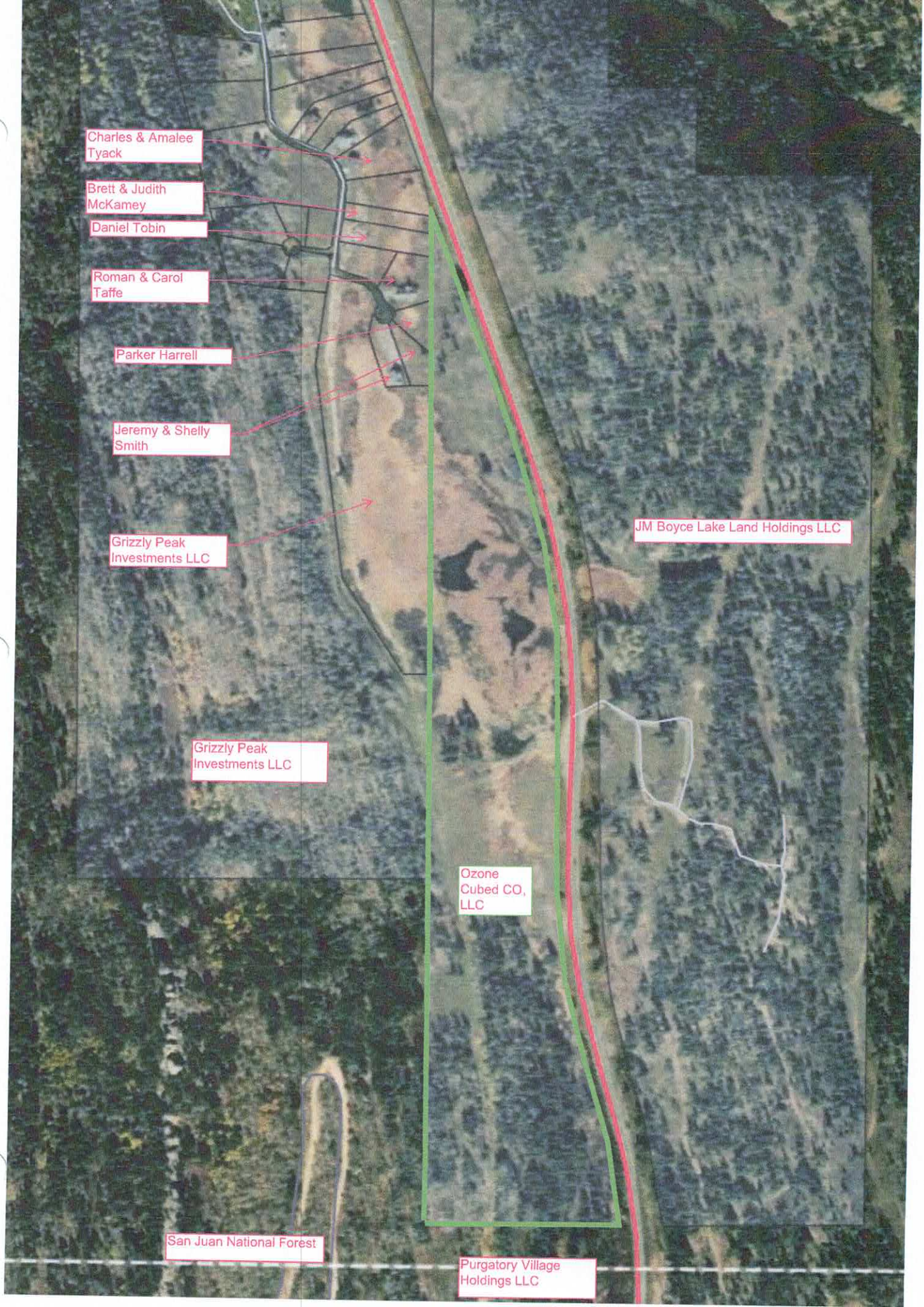
List of Adjacent Landowners

1. Charles & Armalee Tyak
2. Brett & Judith McKamey
3. Daniel Tobin
4. Roman & Carol Taffe
5. Parker Harrell
6. Jeremy & Shelly Smith
7. Grizzly Peak Investments LLC
8. JM Boyce Land Holdings LLC
9. Purgatory Village Holdings LLC
10. San Juan National Forest

Collins Residence
Ozone Cubed CO, LLC

List of Adjacent Landowners

1. Charles & Armalee Tyak
2. Brett & Judith McKamey
3. Daniel Tobin
4. Roman & Carol Tarle
5. Parker Harrell
6. Jeremy & Shelly Smith
7. Grizzly Peak Investments LLC
8. JM Boyce Land Holdings LLC
9. Purgatory Village Holdings LLC
10. San Juan National Forest


Charles & Amalee Tyack
Brett & Judith McKamey
Daniel Tobin
Roman & Carol Taffe
Parker Harrell
Jeremy & Shelly Smith
Grizzly Peak Investments LLC
JM Boyce Lake Land Holdings LLC
Grizzly Peak Investments LLC
Ozone Cubed CO, LLC
San Juan National Forest
Purgatory Village Holdings LLC

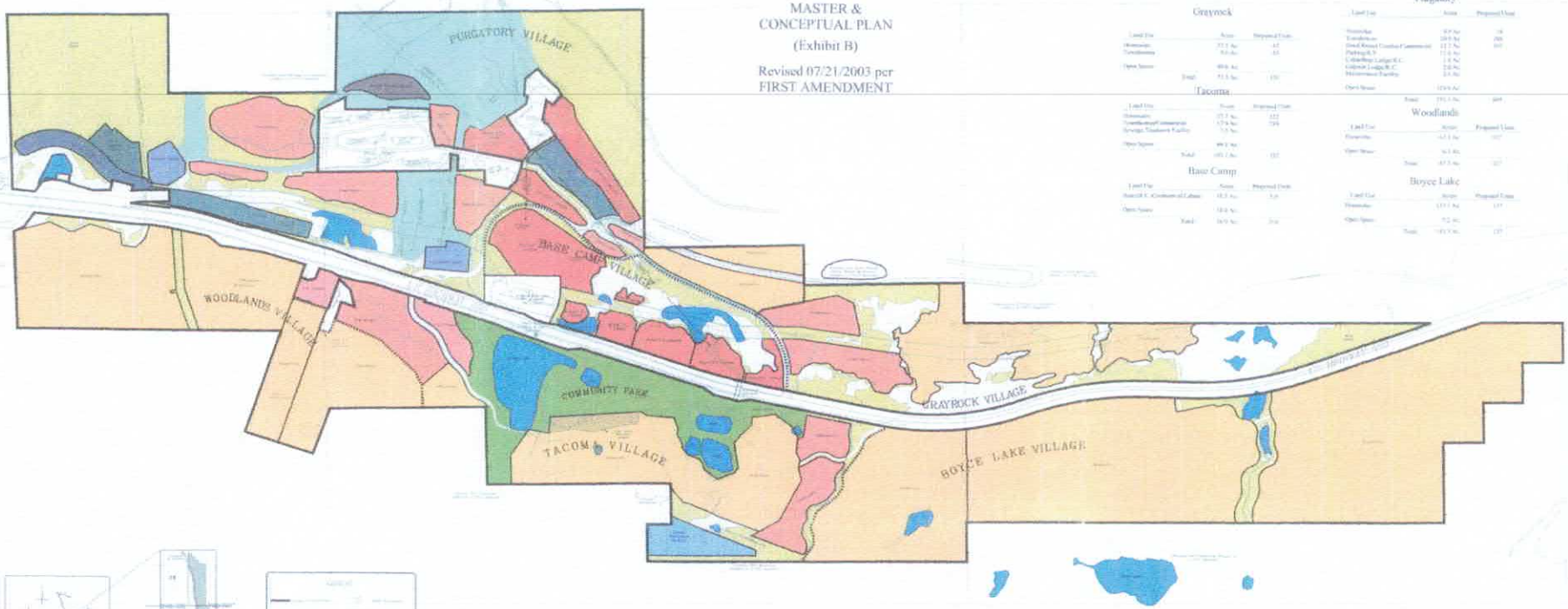
DURANGO MOUNTAIN RESORT

COLORADO

MASTER & CONCEPTUAL PLAN

(Exhibit B)

Revised 07/21/2003 per
FIRST AMENDMENT



Land Use Summary

Land Use	Acres	Proposed Units	Density (DU/AC)	Commercial (Sq. Ft.)
Graymock	29.7 Ac	476	7 to 15	0
Condominiums	57.5 Ac	345	12.0 Max.	60,000
Deed Restricted Condos/Cabins	9.2 Ac	230	30.0 Max.	250,000
Parking/Environmental Setback	12.0 Ac			
Lodge	3.4 Ac			70,000
Maintenance Fac. & Access Fac.	4.0 Ac			
Open Space	244.5 Ac			
Total	411.3 Ac	Units	1,198 DU Gross Ac.	4.9 DU

Graymock

Land Use	Acres	Proposed Units
Homesites	37.7 Ac	65
Condominiums	8.0 Ac	65
Open Space	48.6 Ac	
Total	93.3 Ac	130

Tacoma

Land Use	Acres	Proposed Units
Homesites	27.7 Ac	222
Condominium/Commercial	17.9 Ac	720
Sewage Treatment Facility	5.5 Ac	
Open Space	109.3 Ac	
Total	160.3 Ac	222

Base Camp

Land Use	Acres	Proposed Units
Hotel/B.C. Condos/Commercial	11.5 Ac	110
Open Space	12.6 Ac	
Total	24.0 Ac	110

Purgatory

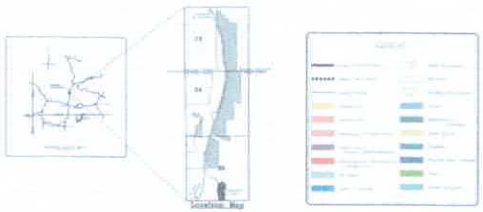
Land Use	Acres	Proposed Units
Homesites	8.9 Ac	18
Condominiums	20.9 Ac	288
Deed Restricted Condos/Commercial	12.2 Ac	207
Parking/R.V.	17.6 Ac	
Cedar Ridge Lodge/B.C.	1.9 Ac	
Lodge/Base Lodge/B.C.	2.0 Ac	
Maintenance/Facility	2.1 Ac	
Open Space	125.6 Ac	
Total	191.3 Ac	513

Woodlands

Land Use	Acres	Proposed Units
Homesites	14.1 Ac	107
Open Space	9.1 Ac	
Total	23.2 Ac	107

Boyce Lake

Land Use	Acres	Proposed Units
Homesites	137.1 Ac	137
Open Space	77.2 Ac	
Total	214.3 Ac	137



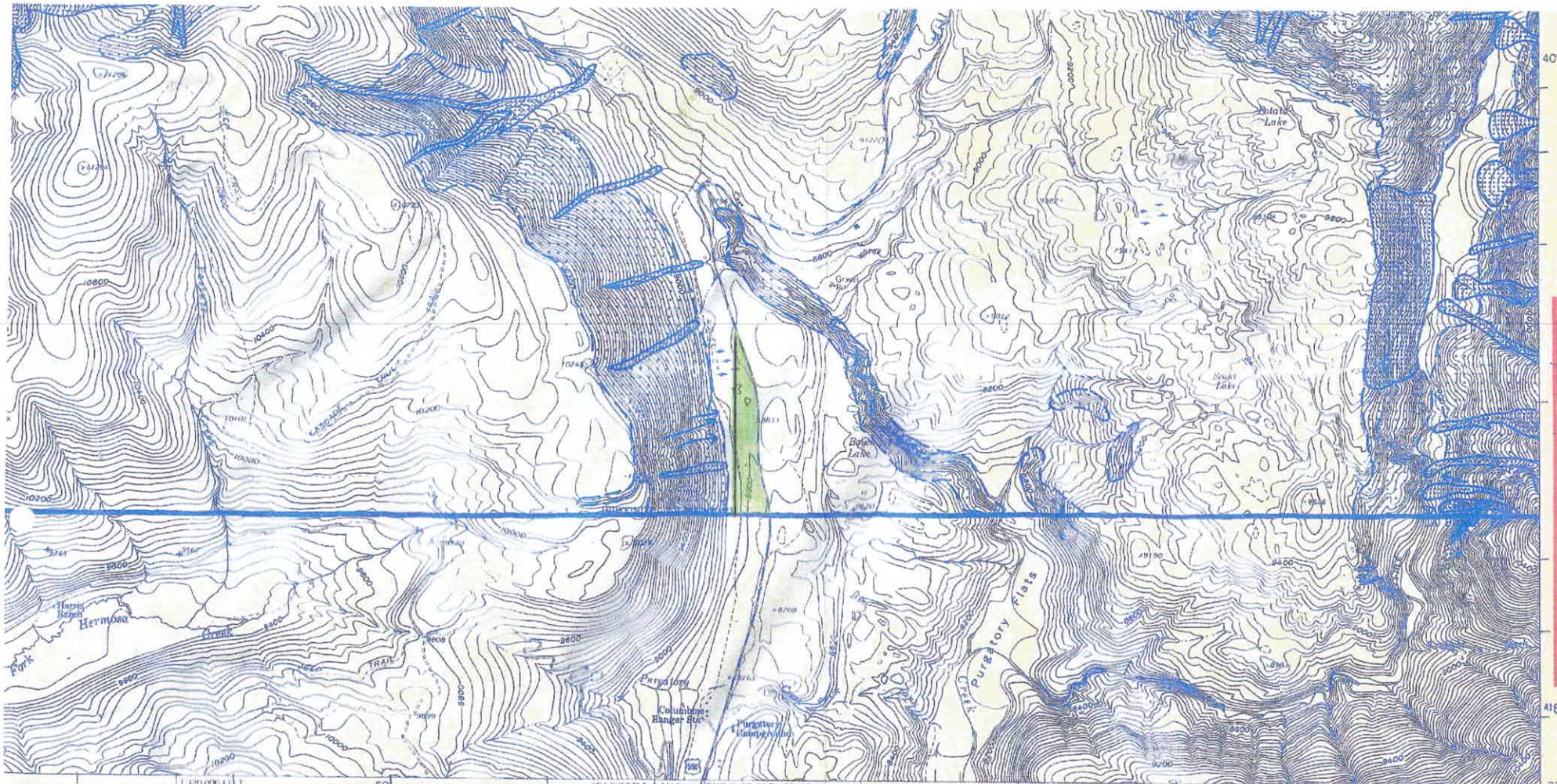
STATE OF COLORADO } ss
SAN JUAN COUNTY }

I hereby state that this instrument was filed for record at 11:10 o'clock A M 5-21-2003 and duly filed Reception Number 142867 Book 11-M
Clerk and Recorder
By Rebecca J. Granville Deputy

DURANGO MOUNTAIN RESORT
COLORADO

GOFF
ENGINEERING & SURVEYING INC.

Revised July 21, 2003
First Amendment
Date: March 1, 2002



Map by Anderson Recorder

e Geological Survey

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1960
can datum
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or grid ticks,
it data

14°
TRUE NORTH
MAGNETIC NORTH
APPROXIMATE MEAN DECLINATION, 1960

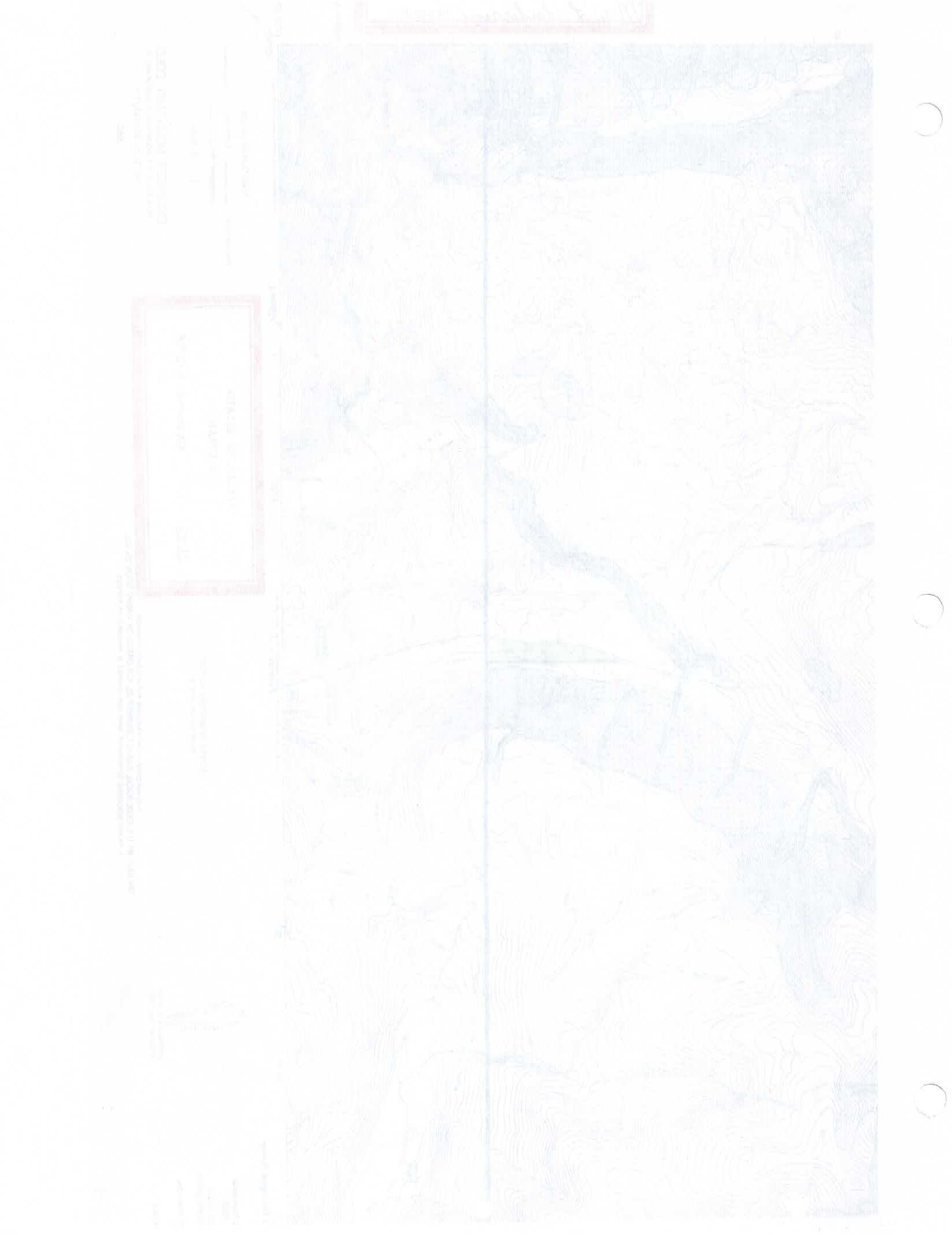
CONTOUR INTERVAL 40 FEET
DATUM IS MEAN SEA LEVEL

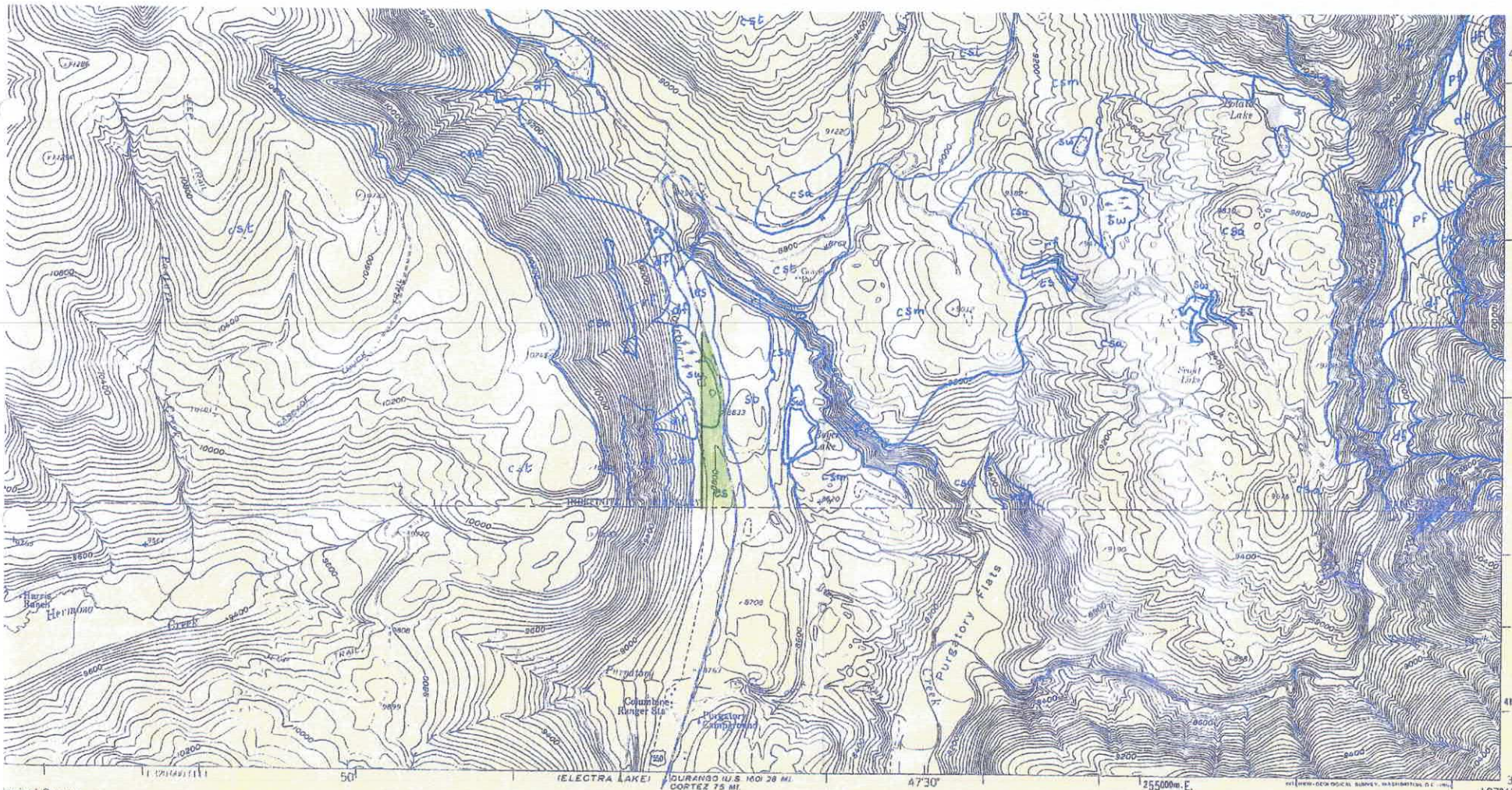
AVALANCHE HAZARD
INSTAAR
Final Approved: 6/2/76

ROAD CLASSIFICATION
Medium-duty ——— Light duty ———
Unimproved dirt . . . . . .
U.S. Route

ENGINEER MOUNTAIN, COLO.
NE/4 ENGINEER MOUNTAIN 15 QUADRANGLE
N3737 5-W10745/7.5
1960

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U.S. GEOLOGICAL SURVEY, DENVER 25, COLORADO OR WASHINGTON 25, D.C.
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST





logical Survey

aerial

um
System.

ticks.

APPROXIMATE MEAN DECLINATION, 1960

TRUE NORTH
MAGNETIC NORTH

CONTOUR INTERVAL 40 FEET
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION

Medium duty ——— Light duty

Unimproved dirt _ _ _

U.S. Route

GEOLOGIC HAZARD MAP
INSTAAR

Final Approved: 6/2/76

ENGINEER MOUNTAIN, COLO.
NE/4 ENGINEER MOUNTAIN 15' QUADRANGLE
N3737.5 - W10745/7.5

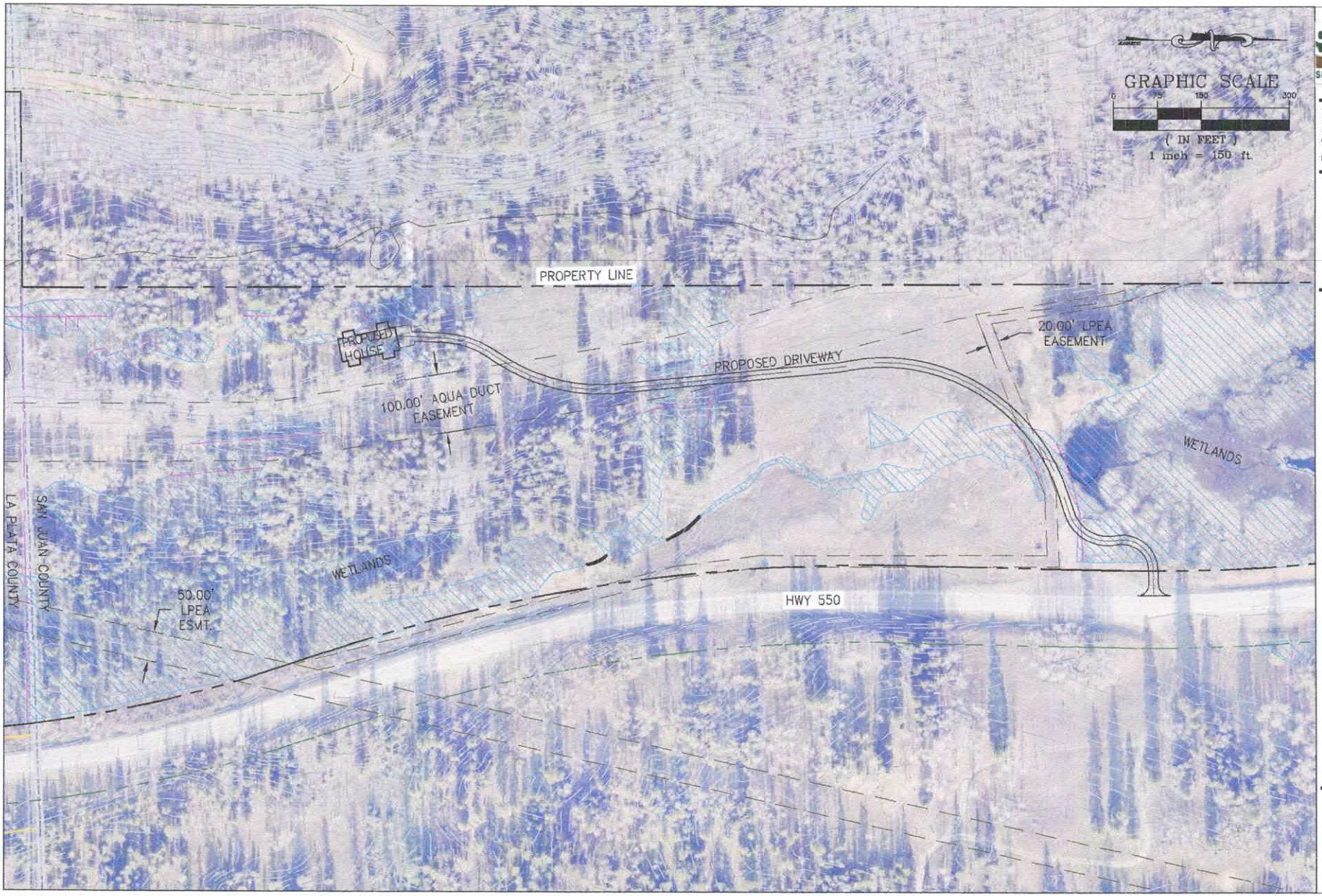
1960

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U.S. GEOLOGICAL SURVEY, DENVER 25, COLORADO OR WASHINGTON 25, D.
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

INDEX TO ADJOINING 7½' QUADRANGLES

NEEDLE MOUNTAIN 1:62500

formerly (Geog. Min. Rpt. 10) FM



SDS
Site Development Solutions
LLC
PO Box 997
Bayfield, CO 81122
970.749.6767 office
sds@durango.net

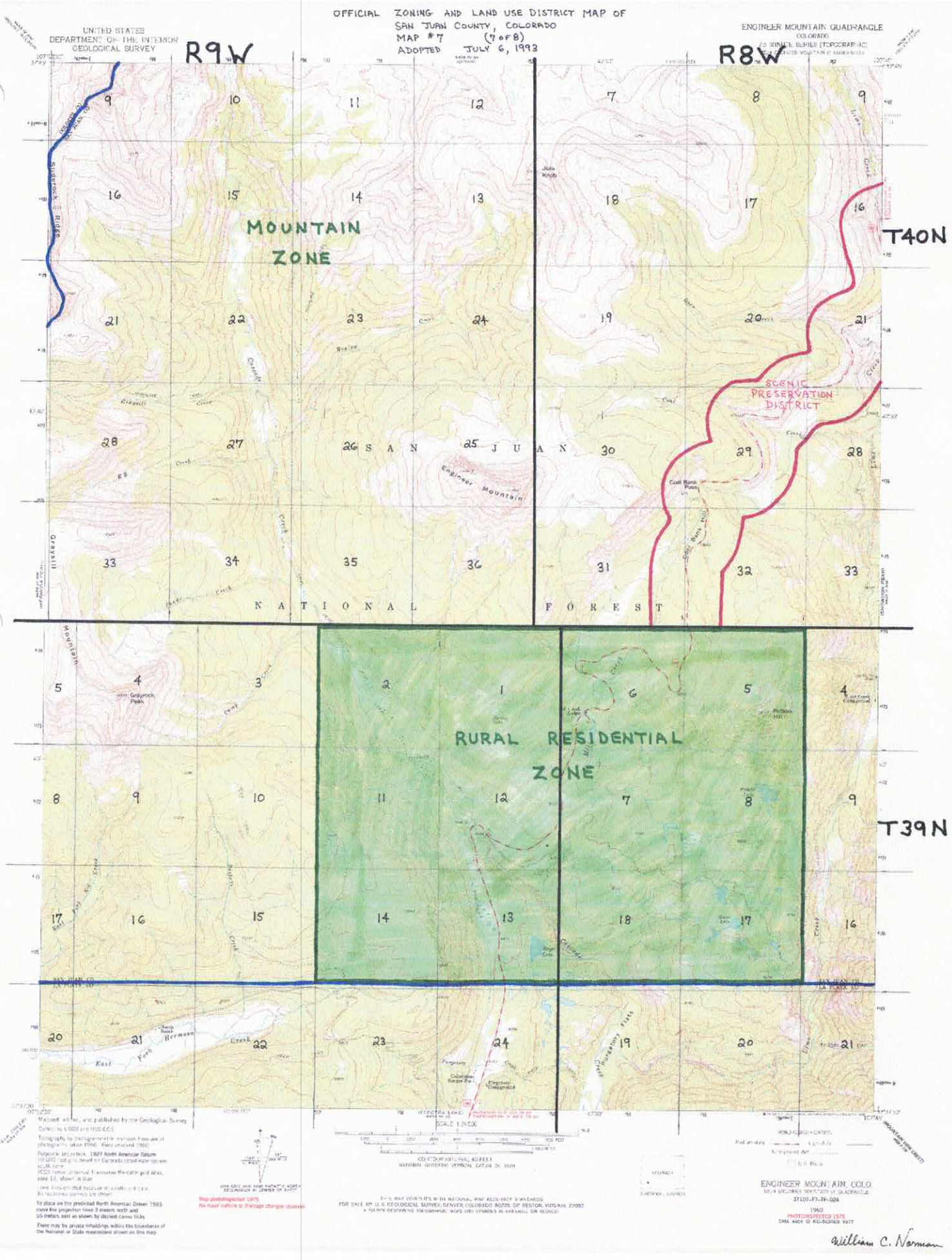
Application for Improvement Permit

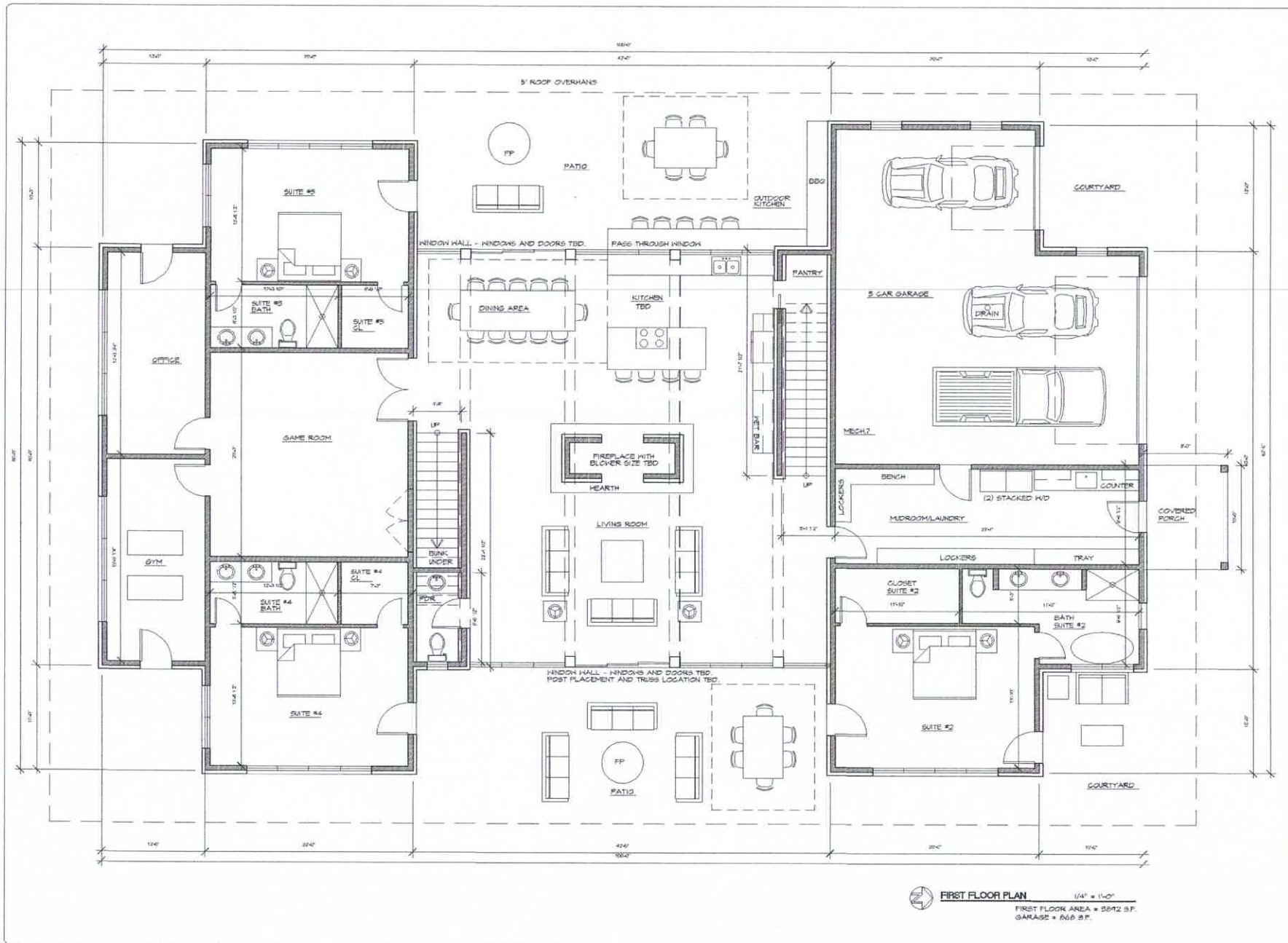
Ozone Cubed CO, LLC

TBD Hwy 550 N.
Durango, CO
San Juan County

C1.0

Site Plan


OFFICIAL ZONING AND LAND USE DISTRICT MAP OF
SAN JUAN COUNTY, COLORADO
MAP #7 (7 of 8)
ADOPTED JULY 6, 1993
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
ENGINEER MOUNTAIN QUADRANGLE
COLORADO
7.5 MINUTE SERIES (TOPOGRAPHIC)
R9W
R8W
T40N
T39N
MOUNTAIN ZONE
RURAL RESIDENTIAL ZONE
SCENIC PRESERVATION DISTRICT
SAN JUAN NATIONAL FOREST
Sluiceback Ridge
Engineer Mountain
Graylock Peak
Cool Bank Placer
Jura Knob
Potato Hill
Hermosa Creek
East Fork
Columbine Gulch Campground
Purgatory Campground
Purgatory Flats
SAN JUAN CO.
LA PLATA CO.
ENGINEER MOUNTAIN, COLO.
1960
PHOTOINSPECTED 1975
William C. Norman



FIRST FLOOR PLAN 1/4" = 1'-0"

FIRST FLOOR AREA = 3842 S.F.
GARAGE = 868 S.F.

PRELIMINARY

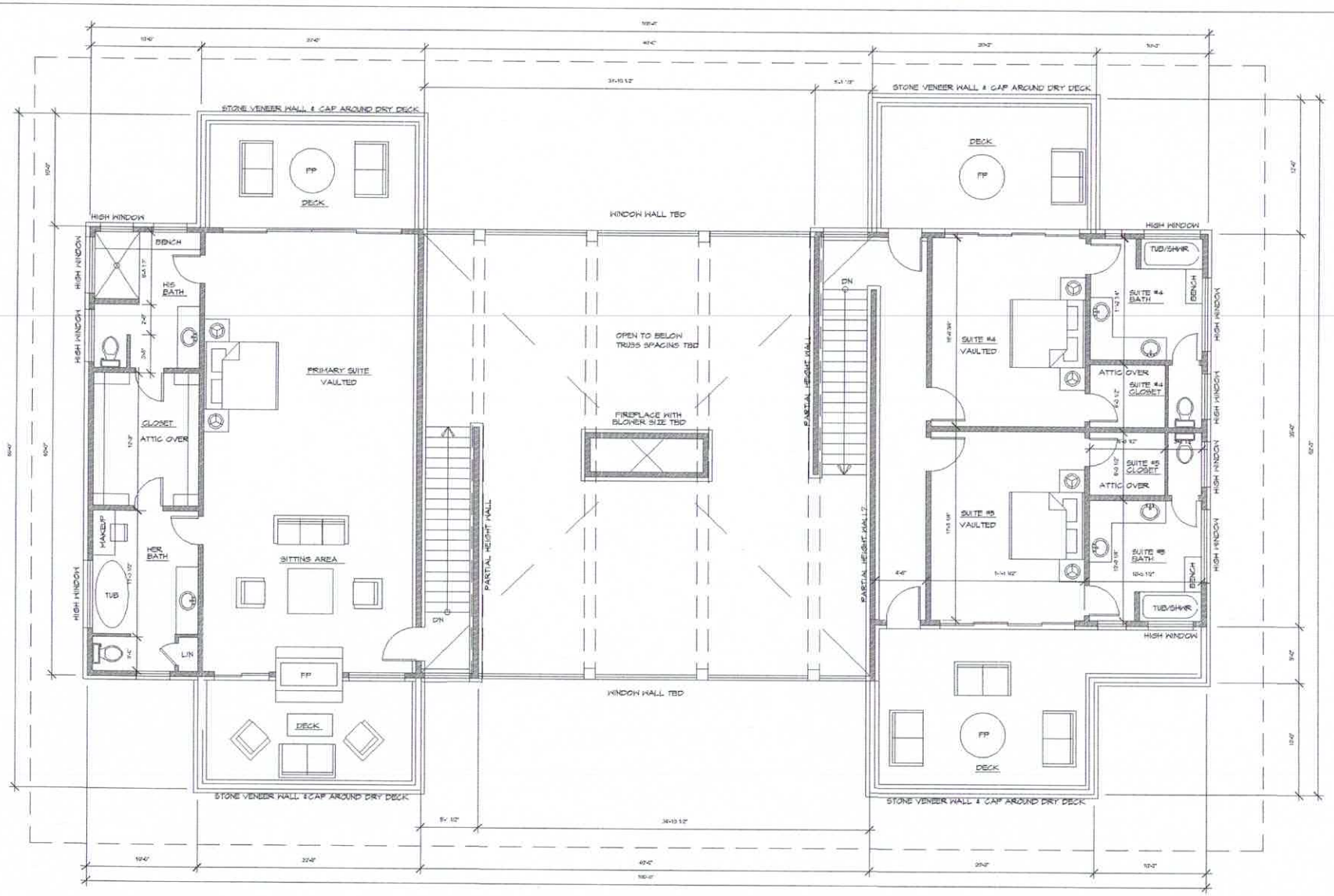
Design Studio, LLC
MARIAH ELDRED
TEL: 970.403.7185 orldesignstudio@mac.com

Collins Residence
Boyce Lake Village North
San Juan County, Co

JOB #	21.031
DATE	11.24.21

FIRST FLOOR PLAN

A1



SECOND FLOOR PLAN 1/4" = 1'-0"

SECOND FLOOR AREA (INC STAIR) = 2442 S.F.

PRELIMINARY

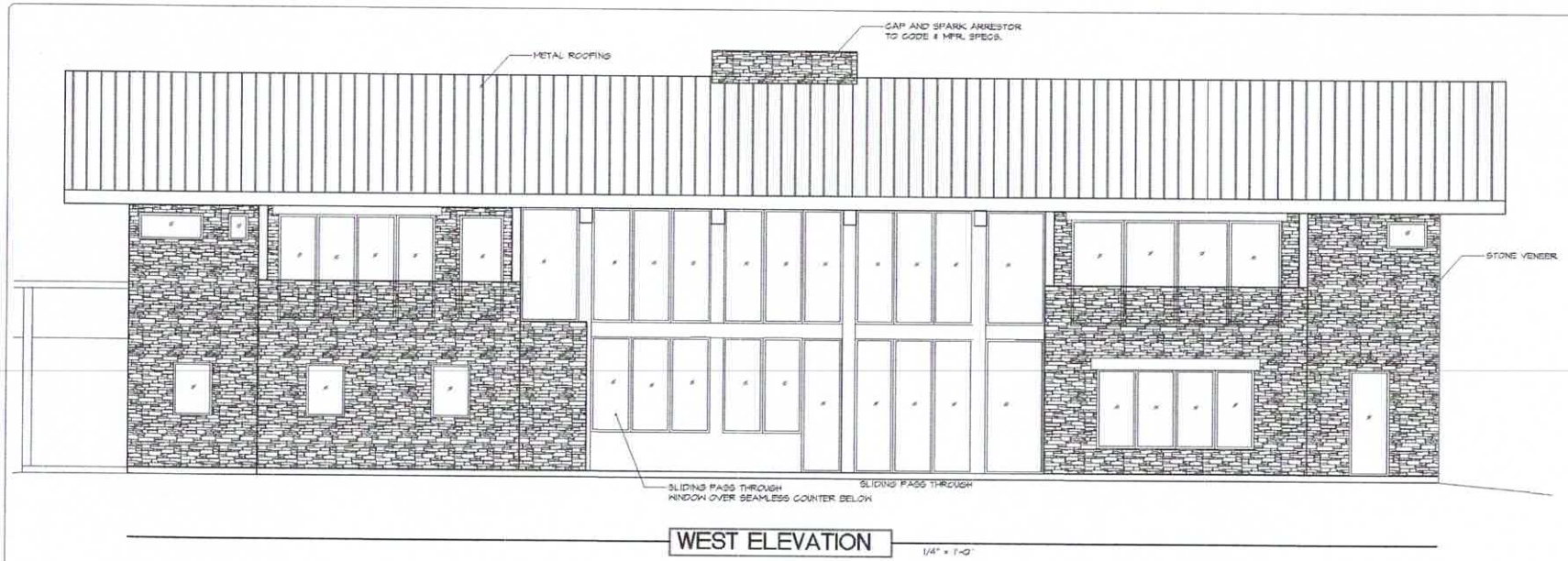
OR Design Studio, LLC
MARIAH ELDRED
TEL. 970.946.2584 orldesignstudio@gmail.com

Collins Residence
Boyce Lake Village North
San Juan County, Co

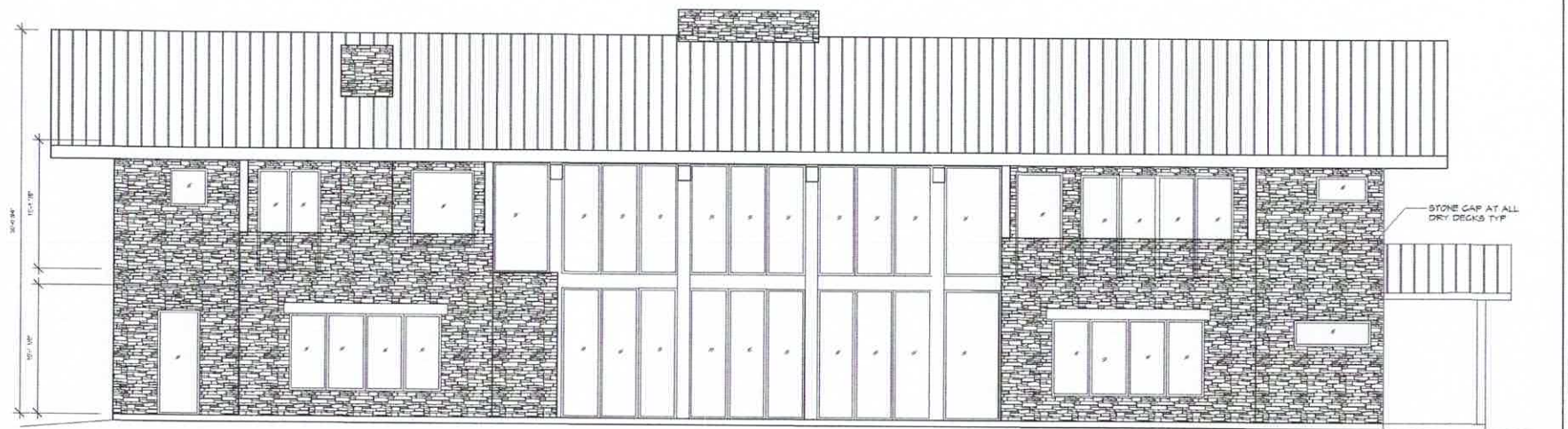
JOB # 21.031
DATE 11.24.21

SECOND FLOOR PLAN

A2



WEST ELEVATION 1/4" = 1'-0"



EAST ELEVATION 1/4" = 1'-0"

PRELIMINARY

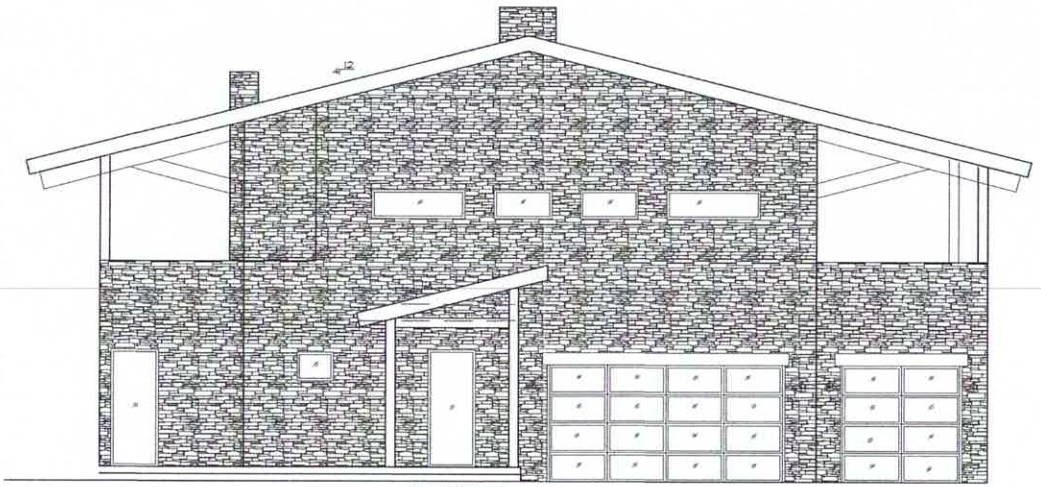
OH Design Studio, LLC
MARIAH ELDRED
TEL: 970.946.3883 ohdesign@msn.com

Collins Residence
Boyce Lake Village North
San Juan County, Co

JOB NO. 21.031
DATE 1.24.21

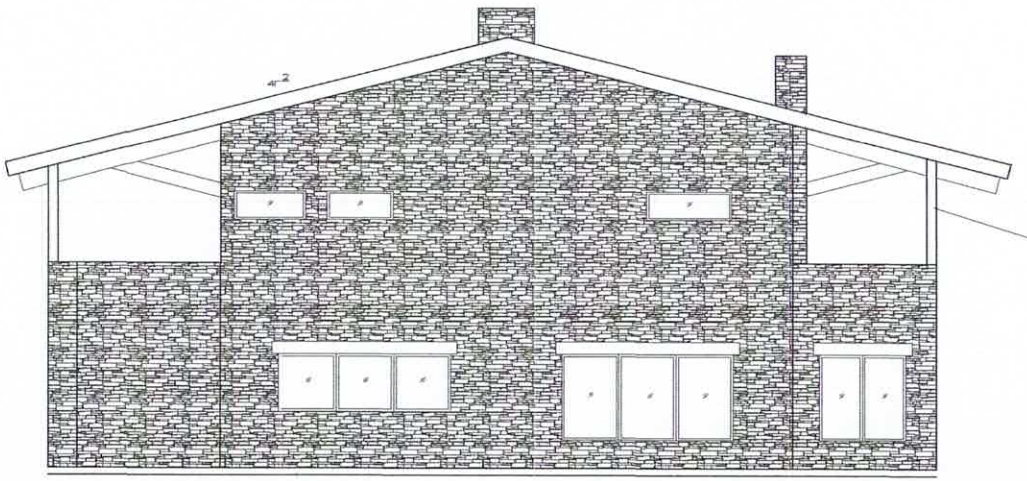
ELEVATIONS

A3



NORTH ELEVATION

1/4" = 1'-0"



POST IF NECESSARY TO BE COORDINATED WITH ENGINEERING

PRELIMINARY

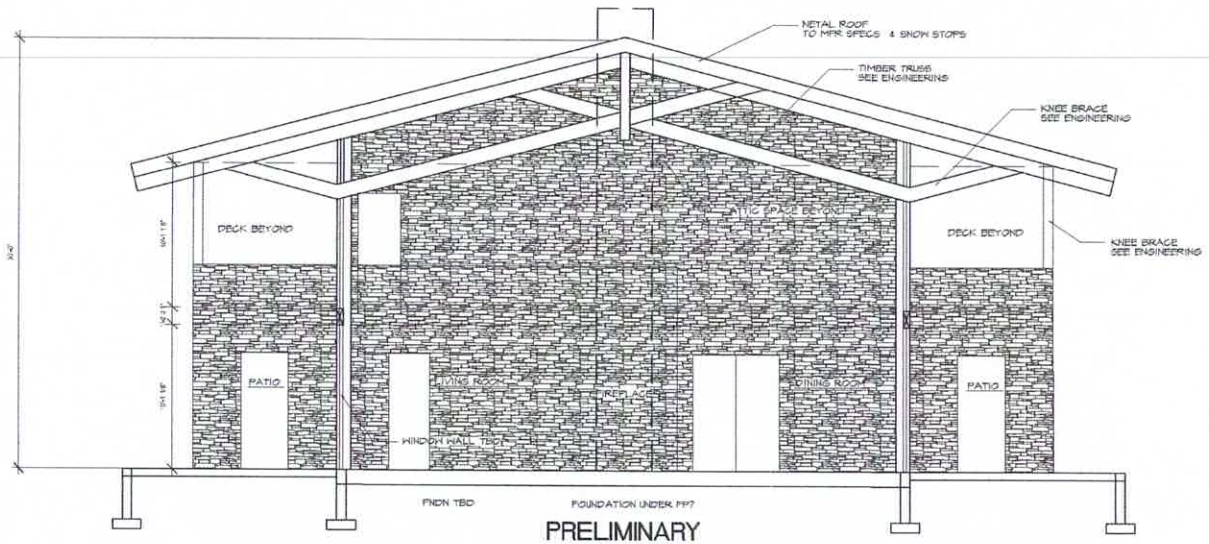
OH Design Studio, LLC
MARIAH ELDRED
TEL: 970.903.2884 oldroseday@msn.com

Collins Residence
Boyce Lake Village North
San Juan County, Co

JOB #: 21.031
DATE: 1.24.21

ELEVATIONS

A4



PRELIMINARY
SECTION B

1/4" = 1'-0"

SEE STRUCTURAL BY SCIFF ENGINEERING
& TRUSS SHEETS BY MFR.

PRELIMINARY

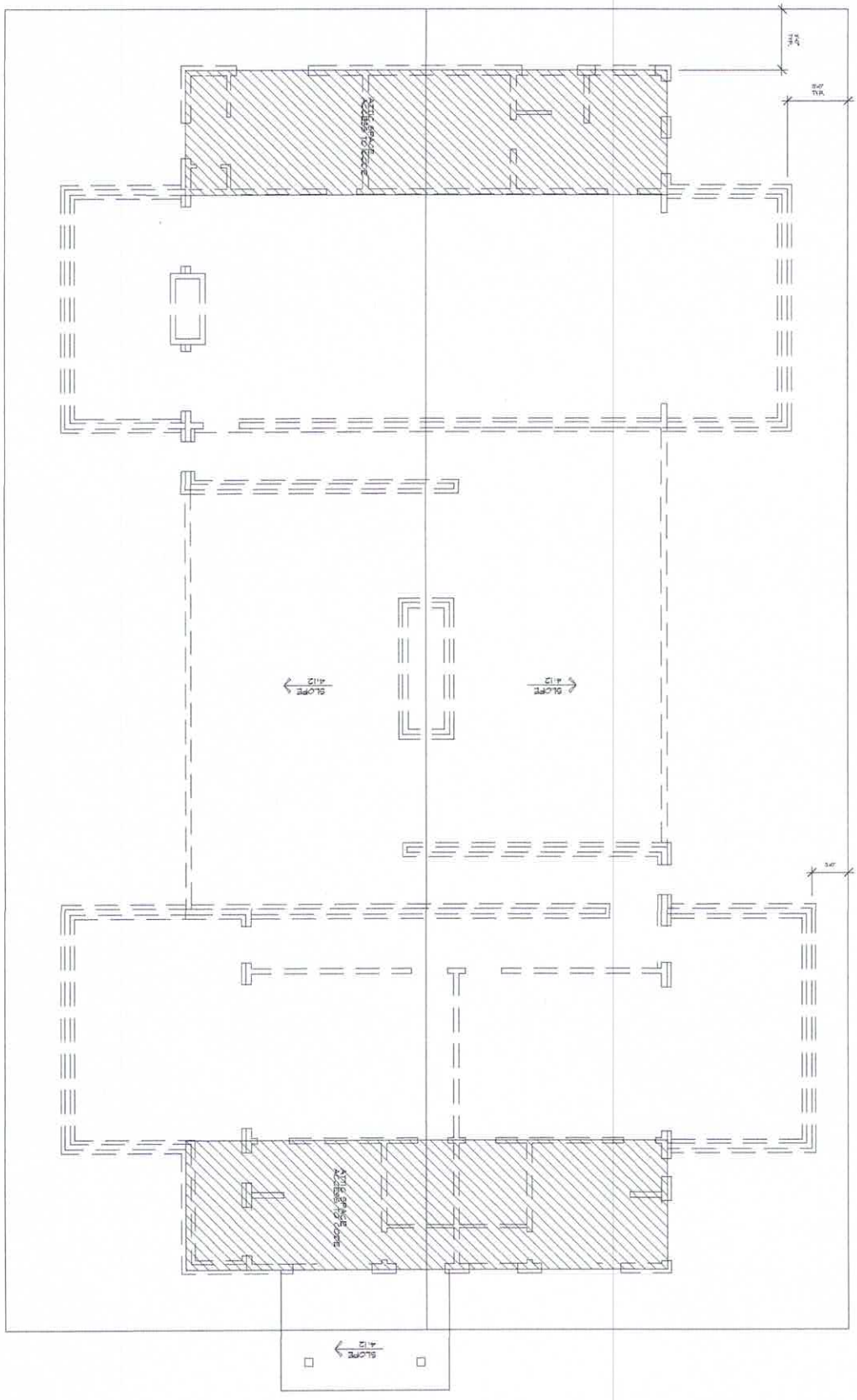
OH Design Studio, LLC
MARIAH ELDRED
TEL. 970.948.2684 ohdesigns@msn.com

Collins Residence
Boyce Lake Village North
San Juan County, Co

JOB # 21.031
DATE 11.24.21

SECTIONS

A5



ROOF PLAN SCALE 1/4" = 1'-0"

PROVIDE ATTIC VENTING AND ACCESS TO CODE
REFER TO TRUSS SHEETS BY MFR

A6

ROOF PLAN

date 21.03.31
plot 1:20.31

Collins Residence
Boyce Lake Village North
San Juan County, Co

OR Design Studio, LLC
MARIAH ELDRED
TEL. 970.948.2884 orldesign@msn.com

PRELIMINARY

SAN JUAN BASIN
public health

Permit # 0572

Year 2021

APPLICATION to Construct, Alter, or Repair an On-site Wastewater Treatment System

Owner: Ozone Cubed LLC Phone: 985-414-1706

Site address: TBD Hwy 550, Durango

Assessor's parcel # 5089 134 000 0002 Subdivision: Boyce Lake Village North Lot#: Greyrock Village North

Lot size: 37.62 (acres) # of Dwellings: 2 # of Bedrooms: 5 + 4 Water supply: Well

I acknowledge: (1) This application does not guarantee that an On-site Wastewater Treatment System ("OWTS") can be installed or a building permit issued; (2) The issuance of the OWTS permit does not imply any warranty by San Juan Basin Public Health as to the operation of the OWTS; (3) The OWTS must be constructed in accordance with the San Juan Basin Public Health On-site Wastewater Treatment System Regulations; and (4) The owner of the property assumes the responsibility and liability for the proper maintenance of the OWTS.

Date: 10/25/21 Owner's signature: Michal Valencia Digitally signed by Michal Valencia DN: cn=Michal Valencia, o, ou, email=sds@durango.net, c=US Date: 2021.10.25 11:15:52 -06'00'

Owner's mailing address: 403 Corporate Wood Dr., Magnolia, TX 77354-2758

Owner's email address: coopercollins@yahoo.com Engineer: mikie.sds@gmail.com

---

[DEPARTMENT USE ONLY]

Permit fee: $_____ Payment type: _____ Rec'd by: _____ Date: _____

Site Evaluation LTAR: _____ Limiting Zone: _____ Depth: _____

PERMIT to _____ **an On-site Wastewater Treatment System**

Septic tank(s): _____ Design flow: _____ (gal/day) Distribution: Gravity or Pressure siphon pump

Soil treatment area: _____

Design Specifications and Comments:

Authorization to begin Construction

Permit must be signed by EHS BEFORE construction begins

_____

Environmental Health Specialist Date

Final Inspection The above system has been inspected and found to comply with the above requirements.

_____ _____

System Installed by (name, company, phone) Environmental Health Specialist Date

_____

System Designed by (name, company, phone)

Form revised 2/7/2017

SAN JUAN BASIN

public health

Permit # 0572

Year 2021

APPLICATION to Construct, Alter, or Repair an On-site Wastewater Treatment System

Owner: Ozone Outlet LLC Phone: 505-419-1709

Site address: TBD Hwy 550 Duranon

Assessor's parcel # 5029 134 000 0029 Subdivision: Bayou Lake Village North Lot: Greylock Village North

Lot size: 37.62 (acres) # of Dwellings: 2 # of Bedrooms: 3 + 4 Water supply: Well

I acknowledge: (1) This application does not guarantee that an On-site Wastewater Treatment System ("OWTS") can be installed or a building permit issued. (2) The issuance of the OWTS permit does not imply any warranty by San Juan Basin Public Health as to the operation of the OWTS. (3) The OWTS must be constructed in accordance with the San Juan Basin Public Health On-site Wastewater Treatment System Regulations; and (4) The owner of the property assumes the responsibility and liability for the proper maintenance of the OWTS

Date: 10/28/21 Owner's signature: Michal Valencia Owner's name (print)

Owner's mailing address: 405 Centauria West Dr. Magnolia TX 77354

Owner's email address: coopercollin@yahoo.com Engineer: mike.sledge@state.co.us

[DEPARTMENT USE ONLY]

Permit fee: $ Payment type: Rec'd by: Date:

Site Evaluation LTAR: Limiting Zone: Depth:

PERMIT to On-Site Wastewater Treatment System

Septic tank(s): Design flow: (gravity) Distribution: Gravity or Pressure Siphon pump

Soil treatment area

Design Specifications and Comments:

Authorization to begin Construction

Permit must be signed by SJBPHS construction begins

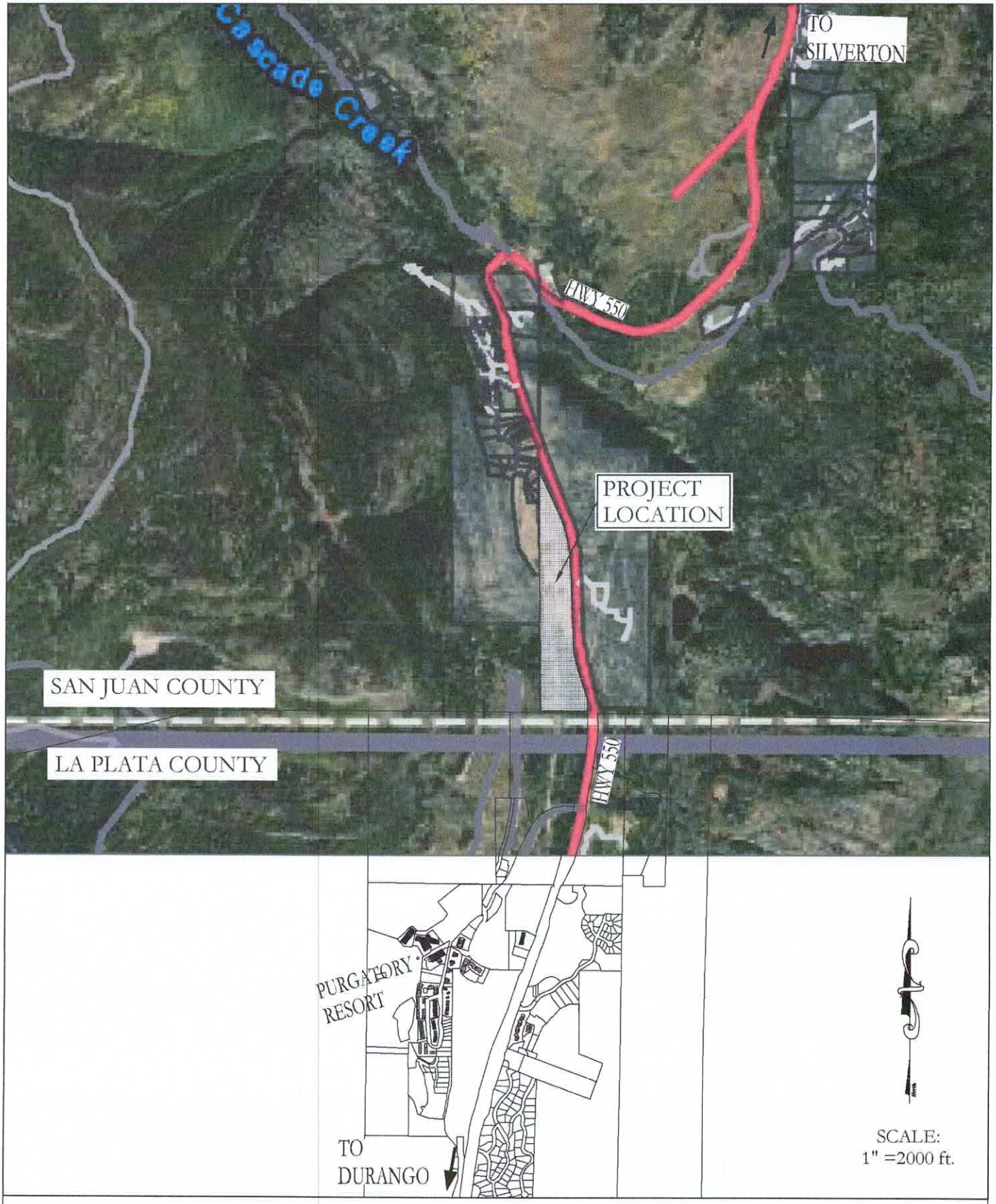
Environmental Health Specialist Date

Final Inspection The above system has been inspected and found to comply with the above permit terms.

System installed by (name, company, phone) Env. mental Health Specialist Date

System Designed by (name, company, phone)

Form revised 2/2/2021



SDS Site Development Solutions LLC
PO Box 997
Bayfield, CO 81122
970-749-6767 ph.
sds@durango.net

Permit Number: WWP2021-0572
Ozone Cubed Co, LLC
TBD Hwy 550, Durango, CO
San Juan County

ISSUE	DATE
#1	1/10/2022

VICINITY MAP

PROPERTY INFORMATION:

A SITE EVALUATION WAS PERFORMED THE PARCEL ON HWY 550 N,, DURANGO, CO ON 10/26/2021. TWO SOIL PROFILE PITS WERE EXCAVATED IN THE AREA OF THE PROPOSED SYSTEM. THE SLOPE IN THE AREA OF THE SYSTEM IS APPROX. 5%. WATER SUPPLY IS A PROPOSED WELL. THE DESIGN IS FOR A 6-BEDROOM DWELLING WITH ROOM FOR EXPANSION IN THE FUTURE, THEREFORE THE SYSTEM WAS DESIGNED FOR 2000 GPD.

SOIL CONDITIONS:

EXISTING SOIL WAS DESCRIBED BY THE NATIONAL COOPERATIVE SOIL SURVEY AS #330 NEEDLETON STONY LOAM OF HYDROLOGIC GROUP C WHICH ARE SOILS HAVING A SLOW INFILTRATION RATE WHEN THOROUGHLY WET, CONSIST CHIEFLY OF SOILS HAVING A LAYER THAT IMPEDES THE DOWNWARD MOVEMENT OF WATER.

SOIL PITS WERE DUG BY MCCARTY EXCAVATION & CONSTRUCTION, INC. WITH A TRACKHOE.

SOIL PROFILE PIT LOGS:

SPP#1

DEPTH: (FT.)	SOIL TYPE & DESCRIPTION
0	
0-2':	TOPSOIL LOAM W/ FEW COBBLE (<35%), WEAK/GRANULAR. SOIL TYPE 2A
2	
2-8':	LOAM W/ LARGE COBBLE (>35%), WEAK/GRANULAR. SOIL TYPE R-1
4	
6	
8	

SPP#2

DEPTH: (FT.)	SOIL TYPE & DESCRIPTION
0	
0-2':	TOPSOIL LOAM W/ FEW COBBLE (<35%), WEAK/GRANULAR. SOIL TYPE 2A
2	
2-8':	LOAM W/ LARGE COBBLE (>35%), WEAK/GRANULAR. SOIL TYPE R-1
4	
6	
8	

WITH THE THE HIGH PERCENTAGE OF ROCK IN THIS AREA, THE SYSTEM WILL BE REQUIRE UNIFORM PRESSURE DISTRIBUTION. A 1-FT DEEP UNLINED SAND FILTER WITH ELJENS FOR TREATMENT LEVEL 2 WILL BE USED FOR TREATMENT.

LONG TERM ACCEPTANCE RATE FOR LOAM SOIL TYPE 2A, TREATMENT LEVEL 2 = 0.80 GAL/SF/DAY

SOIL TREATMENT AREA DESIGN CALCULATIONS:

A PRESSURE DISTRIBUTION, UNLINED SAND FILTER SYSTEM IS PROPOSED USING ELJEN END DRAIN MODULES OVER 12" OF CONCRETE SAND FOR TREATMENT LEVEL 2.

PER TABLE 6-1: 6 BEDROOMS + FUTURE EXPANSIONS => Q = 675 + 1325 = 2000 GAL/DAY

PER TABLE 10-1: SOIL TYPE 2A FOR TREATMENT LEVEL 2 => LTAR = 0.80 GAL/SF/DAY

PER 43.10.C.4: AREA, A = Q/LTAR => A = 2000 GPD/0.80 GPD/SF = 2500 SQ. FT.

NO ADJUSTMENT FACTORS WILL BE USED THEREFORE THE DESIGN WILL BE TWO 12'X105' STA'S OVER 12" OF CONCRETE SAND. SEE SHEETS 4 & 5.

OF MODULES IS THE AREA / 24 SF/MODULE.

2500 SF / 24 SF/EA = 104 MODULES.

USE 2 ROWS OF 17 MODULES AND 1 ROW OF 18 MODULES FOR 104 TOTAL IN THE SYSTEM.

SDS Site Development Solutions LLC
PO Box 997
Bayfield, CO 81122
970-749-6767 ph.
sds@durango.net

Permit Number: WWP2021-0572

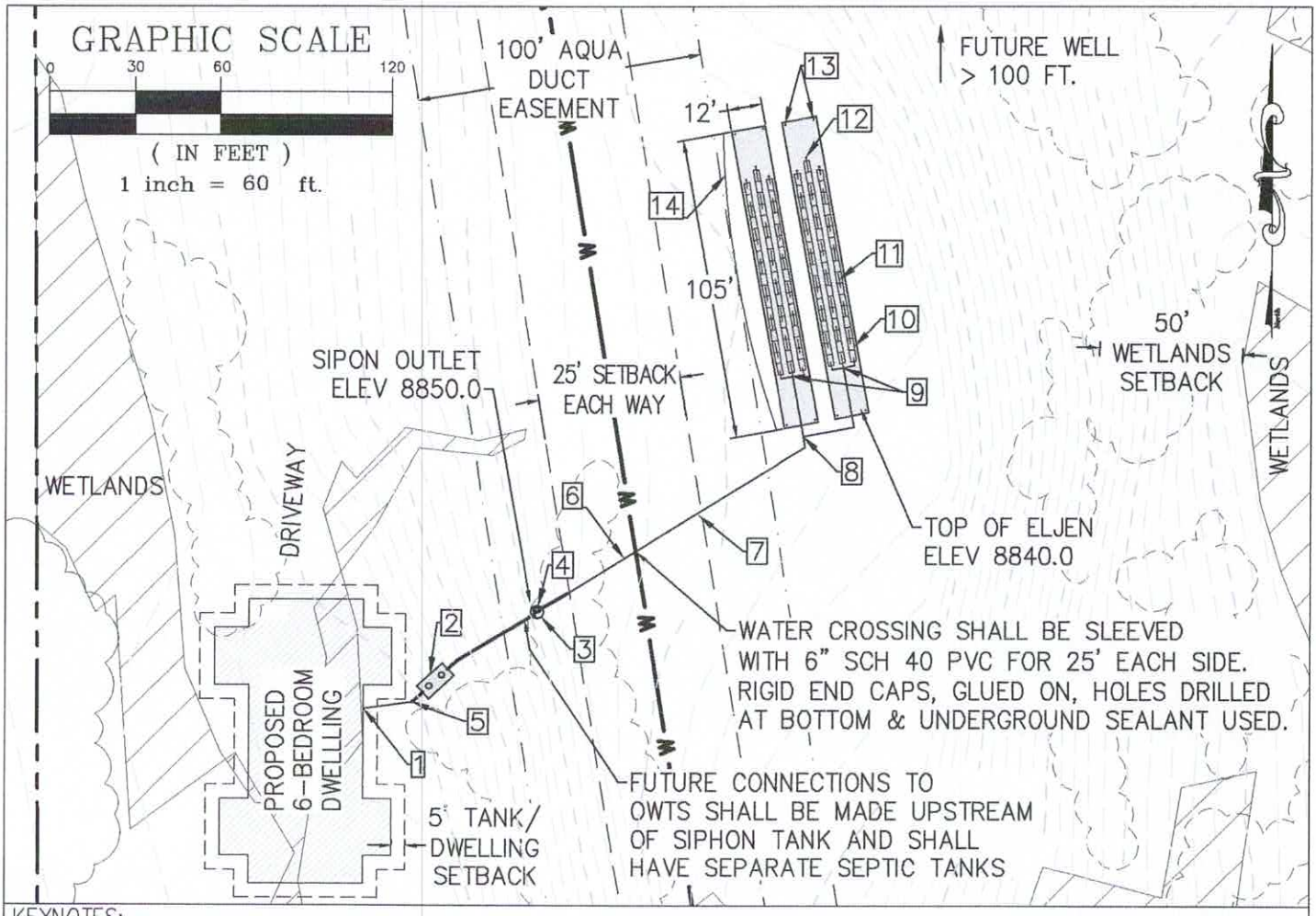
Ozone Cubed CO, LLC

TBD Hwy 550, Durango, CO

San Juan County

ISSUE	DATE
#1	1/10/2022

EX. COND. & DESIGN CALCS



KEYNOTES:

1. INSTALL 2-WAY CLEAN-OUTS AT DWELLINGS PER U.P.C., ANY BENDS PRIOR TO TANK AND EVERY 100 FEET MAX.
2. NEW 1500 GAL TANK WITH RISERS & MANHOLES AT ALL ACCESSES AND AN EFFLUENT FILTER. PLACE TANKS OUT OF DRIVING AREAS AND PROTECT FROM TRAFFIC.
3. NEW 500 GAL SIPHON TANK WITH RISERS & MANHOLE LID.
4. SIPHON SHALL BE FLUID DYNAMICS MODEL **430** OR EQUAL INSTALLED IN 500 GAL SIPHON TANK WITH DOSING COUNTER. PLACE COUNTER INSIDE TANK RISER OR IN PROTECTED AREA.
5. GRAVITY SEWER LINES SHALL BE 4" SDR35 PVC, WITH THE EXCEPTION OF SCH. 40 PVC THAT SHALL EXTEND 5 FT. MINIMUM LENGTH OF EACH SIDE OF SEPTIC TANK AND SHALL BE USED UNDER ANY DRIVING SURFACE.
6. MINIMUM SLOPE ON ALL PIPE RUNS SHALL BE ONE PERCENT (1%) AFTER TANK AND 2% PRIOR TO TANK.
7. PRESSURE SEWER LINE SHALL BE 4" SCH 40 PVC FROM SIPHON OUTLET TO SOIL TREATMENT AREA (STA).
8. 4" TEE TO SPLIT FLOW TO EACH STA.
9. 4"X3" MANIFOLD TO 3" SCH 40 PVC LATERALS.
10. SOIL TREATMENT AREA SHALL BE TWO 12' X 105' BEDS WITH 12" OF CONCRETE SAND (ASTM C33) COMPACTED TO 90%. INSTALL 2 ROWS OF 17 ELJEN MODULES AND 1 ROW OF 18 ELJEN MODULES, 104 TOTAL FOR THE SYSTEM.
11. 3" SCHEDULE 40 PVC PIPE WITH 1/8" DIAMETER ORIFICES DRILLED EVERY 4 FEET AT 12 O'CLOCK POSITION. DRILL ONE 1/4" HOLE AT END OF EACH LATERAL IN 6 O'CLOCK POSITION TO DRAIN. SEE SECTIONS ON PAGE 5.
12. FLUSHING ASSEMBLIES REQUIRED AT ENDS OF ALL THREE LATERALS. SEE DETAIL ON PAGE 5.
13. EIGHT INSPECTION PORTS REQUIRED, ONE ALL ALL CORNERS OF BOTH STA. SEE SECTIONS & NOTES.
14. CONSTRUCT DIVERSION BERM/SWALE TO DIVERT RUNOFF AROUND HIGH SIDE OF FIELD AND CROSS SLOPE TRENCHES TO PROVIDE POSITIVE DRAINAGE AWAY.

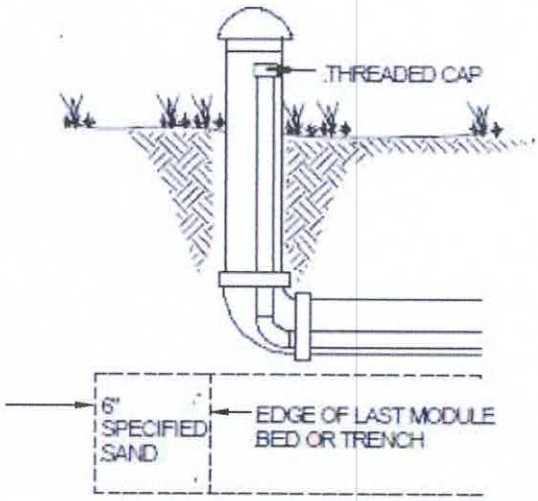
* SEE SHEET 8 FOR ALL SETBACKS. VERIFY PROPERTY LINE, SETBACKS AND DIMENSIONS PRIOR TO CONSTRUCTION.

Site Development Solutions LLC
PO Box 997
Bayfield, CO 81122
970-749-6767 ph.
sds@durango.net

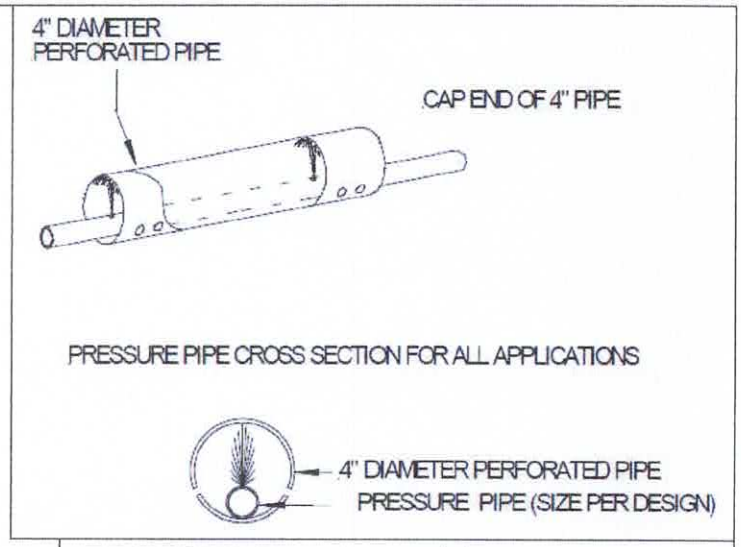
Permit Number: WWP2021-0572
Ozone Cubed CO, LLC
TBD Hwy 550, Durango, CO
San Juan County

ISSUE	DATE
#1	1/10/2022

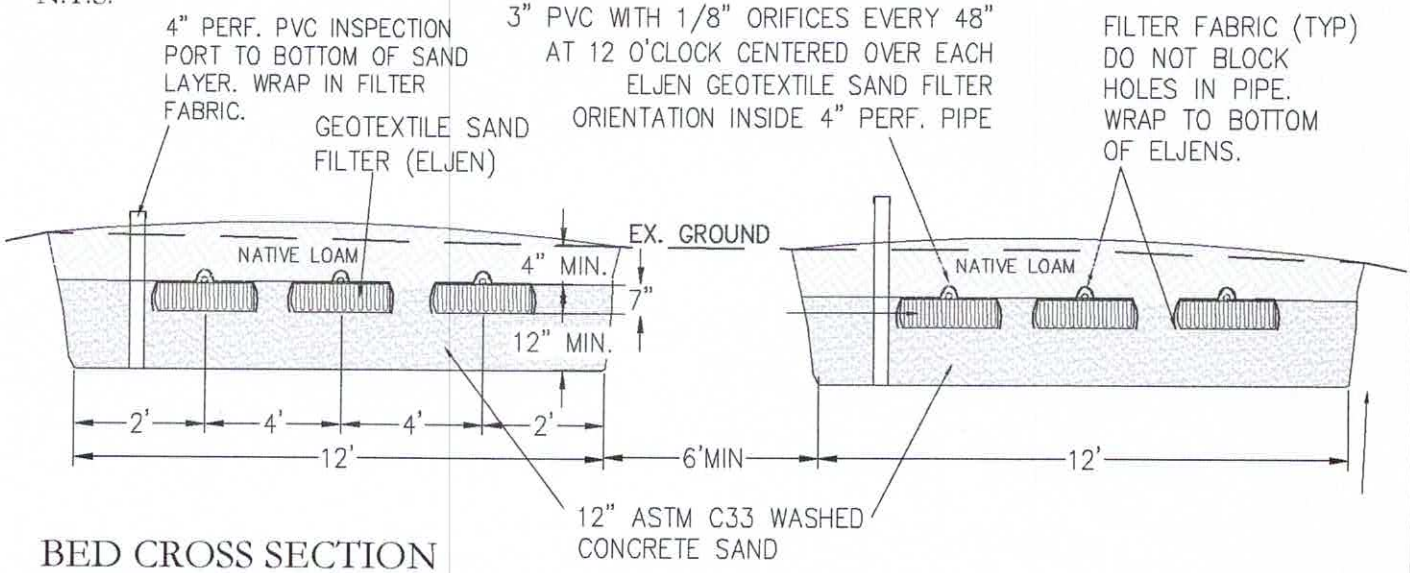
PROPOSED SITE LAYOUT



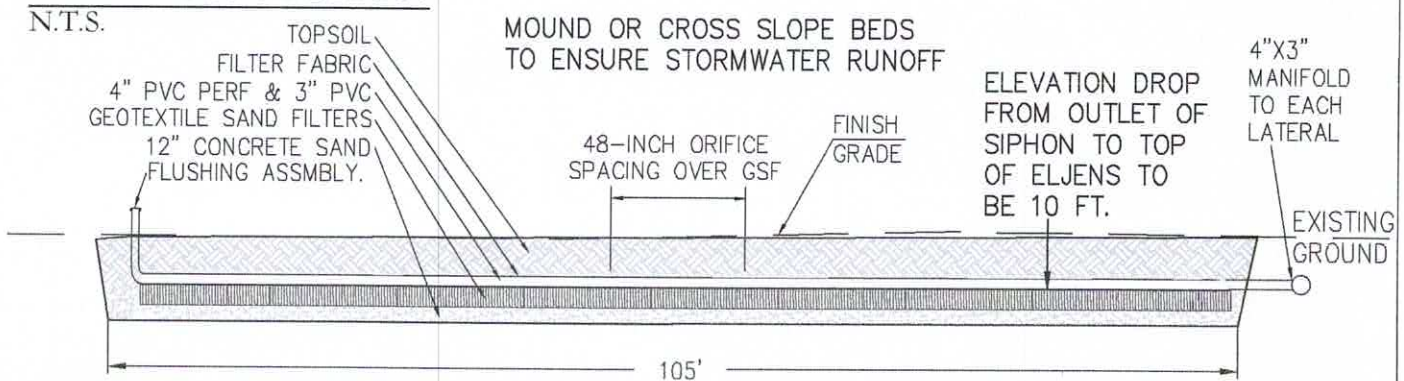
FLUSHING ASSEMBLY
N.T.S.



PRESSURE PIPE DETAIL
N.T.S.



BED CROSS SECTION
N.T.S.



BED LONGITUDINAL SECTION
N.T.S.

Site Development Solutions LLC
PO Box 997
Bayfield, CO 81122
970-749-6767 ph.
sds@durango.net

Permit Number: WWP2021-0572
Ozone Cubed CO, LLC
TBD Hwy 550, Durango, CO
San Juan County

ISSUE	DATE
#1	1/10/2022

SECTIONS

GENERAL NOTES:

THE COMPLETED FACILITY IS SUBJECT TO INSPECTION AND CERTIFICATION BY THE SAN JUAN BASIN HEALTH UNIT AND THE ENGINEER. ENGINEER INSPECTIONS ARE REQUIRED:

1. IMMEDIATELY PRIOR TO BACKFILL OPERATIONS, AFTER DISTRIBUTION SYSTEM HAS BEEN PLUMBED, AND INFILTRATORS INSTALLED. DISTRIBUTION BOX AND SEPTIC TANK TO BE LOCATED AND SWING-TIED FOR AS-BUILTS AND MARKERS INSTALLED AS REQUIRED.
2. AFTER SITE IS COMPLETED, INCLUDING SEEDING OF THE BED SITE.

ALL EQUIPMENT, MATERIALS AND INSTALLATION SHALL BE CONSTRUCTED IN ACCORDANCE TO THIS PLAN AND SPECIFICATIONS, THE LATEST EDITION OF THE ON-SITE WASTEWATER SYSTEM REGULATIONS OF THE SAN JUAN BASIN HEALTH DEPARTMENT, AND MANUFACTURER'S GUIDELINES. IN THE EVENT A CONFLICT EXISTS BETWEEN THESE CRITERIA, THE MORE STRINGENT SPECIFICATION SHALL BE ADHERED TO.

MAINTAIN REQUIRED SETBACKS FROM BUILDINGS, WELLS, ETC., FOR ALL THE NECESSARY SEWER COMPONENTS.

MOTOR VEHICLE TRAFFIC IS PROHIBITED OVER THE ABSORPTION BED OR ABOVE SDR-35 PVC PIPING WITH LESS THAN 3 FT. OF COVER.

ALL CLEARING AND WASTING OF EXCAVATED MATERIAL SHALL BE COORDINATED WITH THE OWNER AND/OR THEIR REPRESENTATIVE.

THE CONTRACTOR SHALL VERIFY THE LOCATION AND ELEVATION OF ALL COMPONENTS PRIOR TO CONSTRUCTION. THE LOCATION OF THE COMPONENTS MAY BE CHANGED DUE TO ACTUAL FIELD CONDITIONS. THE ENGINEER AND SJBHD ARE TO BE NOTIFIED PRIOR TO MAKING ANY SUBSTANTIAL CHANGES AND THEIR APPROVAL OBTAINED.

NO LEGAL SURVEYS WERE PERFORMED AS A PART OF THIS DESIGN. VERIFY PROPERTY LINES PRIOR TO CONSTRUCTION.

THE BUILDING MUST USE LOW FLUSH TOILETS (<2 GAL/FLUSH).

IT IS NOT RECOMMENDED TO DISCHARGE A WATER SOFTENING DEVICE USING SODIUM CHLORIDE (SALT) INTO THE ONSITE WASTEWATER SYSTEM.

IT IS NOT RECOMMENDED TO DRAIN THE CONDENSATION FROM A FURNACE TO THE ONSITE WASTEWATER SYSTEM DUE TO POSSIBLE FREEZING PROBLEMS.

THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES PRIOR TO ANY WORK BEING PERFORMED. ALL CLEARING SHALL BE COORDINATED WITH THE OWNERS OR THEIR REPRESENTATIVE.

WINTER CONSTRUCTION NOTES:

ET/SEEPAGE BEDS CONSTRUCTED DURING WINTER MONTHS SHALL BE STAGED TO PREVENT FREEZING OF FILL MATERIAL, IF THE BED CANNOT BE COMPLETED DURING ONE DAY. FILL MATERIAL SHALL NOT BE FROZEN OR SNOW COVERED.

TRENCHES AND EXCAVATIONS MAY NOT BE LEFT OPEN OVERNIGHT UNCOVERED. PROPER TARPING & BLANKETS MUST BE USED TO PREVENT INTERIOR OF BED FROM FREEZING.

TOPSOIL NOTES:

IF NATIVE LOAM MATERIAL IS AVAILABLE ONSITE AND IS TO BE USED AS FINISH SURFACE ON BED, THE LOAM MATERIAL SHALL BE STOCKPILED SEPARATELY FROM ANY CLAY EXCAVATED DURING CONSTRUCTION OF BED. CLAY SHALL NOT BE USED OR ACCEPTED AS FINISHED SURFACE ON BED.

VENT/INSPECTION PORT NOTES:

A PORT IS REQUIRED AT THE TERMINAL END OF EACH LATERAL IN A TRENCH SYSTEM AND AT EACH CORNER OF A BED SYSTEM.

VENT RISERS MUST BE A MINIMUM OF 24-INCHES ABOVE FINISHED GRADE AND SHALL HAVE AN 180° RETURN WITH SCREENED END. DO NOT GLUE FITTINGS ON VENT RISER TO ALLOW FOR FUTURE INSPECTIONS. CAPS & PERFORATION OF PIPE ABOVE GROUND MAY BE USED IN LIEU OF 90'S. SCREENING REQUIRED.

SEPTIC TANK CONSTRUCTION NOTES:

SEPTIC TANK(S) SHALL CONFORM TO COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT (CDPHE) REQUIREMENTS. METAL AND METAL COATED TANKS ARE NOT ACCEPTABLE.

THE TANK SHALL BE DESIGNED AND CONSTRUCTED TO THE REQUIREMENTS OF THE ON-SITE WASTEWATER SYSTEM REGULATIONS OF THE SAN JUAN BASIN HEALTH DEPARTMENT, MOST CURRENT VERSION.

TREATMENT UNIT(S) SHALL BE SET ON FIRM AND LEVEL BASE AND SHALL BE CAPABLE OF ACCOMMODATING FLOW WITH HYDRAULIC EFFICIENCY

BACKFILLING OPERATIONS SHALL BE ACCOMPLISHED IN A MANNER TO PREVENT SETTLEMENT OF THE STRUCTURE AND WHICH DOES NOT CAUSE EXCESSIVE STRESS ON THE INLET/OUTLET PLUMBING.

IN LOCATIONS WHERE GROUNDWATER MAY CAUSE INSTABILITY OF THE STRUCTURE, ANCHORAGE WILL BE REQUIRED TO PREVENT FLOTATION.

PIPE CONFORMING TO ASTM D-1785 SCHEDULE 40 SHALL EXTEND A MINIMUM OF FIVE FEET FROM INLET AND OUTLET OF THE STRUCTURE TO PREVENT DAMAGE CAUSED BY SETTLEMENT.

CLEANOUTS SHALL EXTEND 6" MIN. ABOVE FINISHED GRADE AND/OR PERMANENT MARKERS IDENTIFYING THEIR LOCATION SHALL BE INSTALLED.

THE SEPTIC TANK SHALL BE WATERTIGHT AND CONSTRUCTED TO WITHSTAND EARTH AND HYDROSTATIC PRESSURES WHEN FULL OR EMPTY.

SEPTIC TANK SHALL HAVE A MINIMUM LIQUID CAPACITY BASED UPON THE NUMBER OF BEDROOMS.

BED CONSTRUCTION NOTES:

VENT PIPING (4" PVC) SHALL BE AT BOTH ENDS OF EACH LATERAL. PIPING MAY BE CONNECTED TO REDUCE THE NUMBER OF ABOVE GRADE VENTS – A MINIMUM OF FOUR VENTS ARE REQUIRED FOR BED SYSTEMS AND A MINIMUM OF TWO VENTS ARE REQUIRED ON EACH LATERAL FOR TRENCH SYSTEMS.

MINIMUM SLOPE ON ALL DELIVERY LINES SHALL BE 1%. ALL PIPE BENDS SHALL BE 45 DEGREE ELLS OR LONGSWEEP QUARTERBENDS. CLEANOUTS BETWEEN HOUSE AND TANK SHALL BE PROVIDED AT INTERVALS OF NOT MORE THAN 100 FEET. DELIVERY PIPE AND FITTINGS TO BE FOUR-INCH DIAMETER PVC WITH THE MINIMUM WALL THICKNESS CONFORMING TO ASTM 3034, SDR 35.

THE BED CONFIGURATION MAY CHANGE WITH ENGINEER & SJBHD APPROVAL.

VENT/INSPECTION PORT NOTES:

A PORT IS REQUIRED AT THE TERMINAL END OF EACH LATERAL IN A TRENCH SYSTEM AND AT EACH CORNER OF A BED SYSTEM.

VENT RISERS MUST BE A MINIMUM OF 24-INCHES ABOVE FINISHED GRADE AND SHALL HAVE AN 180 DEGREE WITH SCREENED END. DO NOT GLUE FITTINGS ON VENT RISER TO ALLOW FOR FUTURE INSPECTIONS. CAPS & PENETRATION OF PIPE ABOVE GROUND MAY BE USED IN LIEU OF TEES. SCREENING REQUIRED.

SEPTIC TANK CONSTRUCTION NOTES:

SEPTIC TANK(S) SHALL CONFORM TO REGULATED DEPARTMENT OF ENVIRONMENT (DEPARTMENT) REQUIREMENTS. METAL AND METAL COATED TANKS ARE NOT ACCEPTABLE.

THE TANK SHALL BE DESIGNED AND CONSTRUCTED TO THE REQUIREMENTS OF THE ON-SITE WASTEWATER SYSTEM REGULATIONS OF THE SAN JUAN BASIN HEALTH DEPARTMENT, MOST RECENT VERSION.

TREATMENT UNIT(S) SHALL BE SET ON FIRM AND LEVEL BASE AND SHALL BE CAPABLE OF ACCOMMODATING FLOW WITH HYDRAULIC EFFICIENCY.

BACKFILLING OPERATIONS SHALL BE ACCOMPLISHED IN A MANNER TO PREVENT SETTLEMENT OF THE STRUCTURE AND WHICH DOES NOT CAUSE EXCESSIVE STRESS ON THE UNIT/OUTLET PLUMBING.

IN LOCATIONS WHERE GROUNDWATER MAY CAUSE INSTABILITY OR UNIT FLOTATION, ANCHORAGE WILL BE REQUIRED TO PREVENT FLOTATION.

PIPE CONFORMING TO ASTM D-1785 SCHEDULE 40 SHALL PROVIDE A MINIMUM OF TWO FEET FROM INLET AND OUTLET OF THE STRUCTURE TO PREVENT DAMAGE CAUSED BY SETTLEMENT.

CLEANOUTS SHALL EXTEND 6" MIN. ABOVE FINISHED GRADE AND/OR PAVEMENT. MARKERS IDENTIFYING THEIR LOCATION SHALL BE INSTALLED.

THE SEPTIC TANK SHALL BE WATERTIGHT AND CONSTRUCTED OF REINFORCED CONCRETE AND HYDROSTATICALLY PRESSURE WE-CH FULL OR EMPTY.

SEPTIC TANK SHALL HAVE A MINIMUM LIQUID CAPACITY PER UNIT THE LARGER OF TWENTY

BED CONSTRUCTION NOTES:

VENT PIPING (4" PVC) SHALL BE AT BOTH ENDS OF EACH LATERAL. PIPING MAY BE CONNECTED TO REDUCE THE NUMBER OF ABOVE GRADE VENTS + A MINIMUM OF ROOF VENTS ARE REQUIRED FOR BED SYSTEMS AND A MINIMUM OF TWO VENTS ARE REQUIRED ON EACH LATERAL FOR TRENCH SYSTEMS.

MINIMUM SLOPE ON ALL DISTRIBUTION LINES SHALL BE 0%. ALL PIPE SHOULD BE AS DESIGNED, E.G. 0% CONSWEEP CONFIGURATIONS. DOWNHILL BEDWETTING HOUSE AND TANK SHALL BE PROVIDED AT INTERVALS OF NOT MORE THAN 100 FEET. DISTRIBUTION PIPE AND FITTINGS TO BE 4 FOUR INCH DIAMETER PVC WITH THE MINIMUM WALL THICKNESS CONFORMING TO ASTM 2034, SDR 35.

THE BED CONFIGURATION MAY CHANGE WITH ENGINEER & SOILS APPROVAL.

BED CONSTRUCTION NOTES CONTINUED:

TOPSOIL TO BE NATIVE LOAM MATERIAL. LARGE ROCKS, IF ENCOUNTERED, SHALL BE REMOVED. DRAINAGE TO BE PROVIDED BY CROSS SLOPING THE BED TO KEEP RAIN AND SNOW MELT RUNOFF FROM INFILTRATING THE BED.

ALL LINES AND FITTINGS SHALL HAVE ROCK FREE COMPACTED BEDDING MATERIAL PLACED AROUND THE LINES TO A DEPTH OF 12" ABOVE THE TOP OF THE PIPE. ABOVE THAT DEPTH, NATIVE MATERIAL MAY BE USED. NO ROCKS SHOULD BE PLACED IN THE TRENCH THAT ARE LARGER THAN 8"–12" IN SIZE, NOR SHOULD WOOD, ROOTS, OR OTHER DEBRIS BE PLACED IN TRENCHES. MOUND ALL TRENCHES TO PROVIDE FOR SETTLEMENT.

THE BED SHALL BE EXCAVATED TRUE AND LEVEL TO THE DIMENSIONS SHOWN. THE BED BASE SHALL CONSIST OF SCARIFIED NATIVE MATERIAL.

AFTER BED(S) COMPLETION, BEDS SHALL BE REVEGETATED WITH NATIVE GRASSES AND ACCEPTABLE BUSHES & SHRUBS. NATIVE GRASS SEED MIXTURE SHALL BE APPLIED AT A RATE OF APPROX. 6 LBS. PER 1000 S.F. THE SEED SHALL BE RAKED INTO THE TOPSOIL WITH NEW LAWN FERTILIZER & MULCH APPLIED PER MANUFACTURER'S REQUIREMENTS. FLOWERS AND SHRUBS MAY BE PLACED AS DIRECTED BY OWNER.

SETBACKS:	SEPTIC TANK	ABSORPTION BED
SPRINGS, WELLS, SUCTION LINES	50	100
POTABLE WATER SUPPLY LINES	10	25
CISTERN	50	100
DWELLING OR OCCUPIED BUILDINGS	5	20
PROPERTY LINES	10	10
SUBSOIL DRAINS	10	25
LAKE, WATER COURSE, OR STREAM	50	50
SEASONAL LATERAL IRRIGATION DITCH	25	25
DRY GULCHES	10	25
SEPTIC TANK	–	10
STEEP SLOPE	10	25

SIPHON DESIGN WORKSHEET

Owner:	Ozone Cubed CO, LLC	Siphon Designer:	Michal Valencia
Address:	TBD Hwy 550 N., Durango	Tel:	970-749-6767
Permit :	2021-0572	Installer:	Justin McCarty
Date:	1/17/2022	Tel:	970-759-2804

Siphon diameter selection:

Daily sewage volume:	Qs=	2000	gal/day				
Allowable soil loading rate:	Q_L=	0.8	gal/sq. ft. /day				
Total soil area required:	A_T=	2500.0	sq. ft.				
Trench (0.8 Factor)							
Bed bottom area required:		2500.0	sq. ft.				
Geotextile Sand Filter (0.9)							
Infiltrator (0.7)							
Bed bottom area required:		2500.0	sq. ft.				
Lateral width	T_W=	12	ft	104 Eljens			
Bed length	L=	208.0	ft.	Eljens 2 rows	L	Eljens 1 row	L
Number of Rows:		3.0		17	68	18	72
Total length of rows:	T_L=	416.0	ft.				
Orifice spacing:	**O_S=**	**4**	**ft.**				
Number of orifices:	N_O=	104					
Orifice diameter:	**O_D=**	**1/8**	**inches**				
Lowest level in dose tank:		**8850.0**	**ft.**				16.875
Highest drainfield lateral:		**8840.0**	**ft.**				
Orifice head	H_O=	10.0	ft.				
Orifice discharge rate:	Q_O=	0.60	gal/min				
Siphon discharge rate:	Q_t=	63	gal/min				
Selected siphon diameter:	S_D=	4					

(3" if Q_t is less than 100 gpm, 4" if Q_t greater than 100 gpm)

			Main		Lateral	Lateral Option
Elevation Head (gravity)	HG =	E2-E1	10.0	ft.	9.58 ft.	9.58 ft.
Total Discharge Rate		**Qt = QO x NO**	63	gal/min	63 gal/min	gal/min
Forecmain Diameter			4	inch	**3 inch**	**2 inch**
Forcemain Fricton Factor		F	0.28	ft/100 ft	1.13 ft/100 ft	8.15 ft/100 ft
Forcemain Length			150.00	LF	416.0 LF	416.0 LF
Forcemain Headloss, HL		**(F x LFM/100)**	0.418	ft.	4.704 ft.	33.887 ft.
Orifice Pressure Head (HG -HL),			**9.58**	ft. >2.5 feet	**4.88** ft.	**-24.30** ft.

Siphon dose selection:

Pipe type/class:	SCH40	**Nominal pipe inside diameter**	3.00	
		Actual pipe inside diameter	3.00	in.
		Actual pipe unit volume	0.367	gal/ft
Total length of laterals (L)	416			
Total vol in laterals (VL)	152.76	gal.		

	Dose volume = 3X - 5X Pipe Vol (VL*3)		458	gallons	
x	3rd Chamber	Chamber Volume (V)	125.00	gal / ft	
	4' Manhole	Chamber Volume (V)	94.00	gal / ft	x
		Depth of minimum dose	4.88	ft. =	59 inches

Selected siphon: (from siphon table, diameter/drawdown)

Make: Fluid Dynamics Model: 430

Draw Down	30	in	235 gal/dose
Application Rate			0.09 GAL/SQ FT

0.25 - 1.0 GALLON PER SQ. FT. MAX LOADING RATE

COLORADO
Division of Water Resources
Department of Natural Resources

WELL PERMIT NUMBER 324946-
RECEIPT NUMBER 10017600

ORIGINAL PERMIT APPLICANT(S)

OZONE CUBED CO LLC (COLLINS, COOPER)

APPROVED WELL LOCATION

Water Division: 7 Water District: 30
Designated Basin: N/A
Management District: N/A
County: SAN JUAN
Parcel Name: N/A
Physical Address: HWY 550 N DURANGO, CO 81301

SW 1/4 NE 1/4 Section 13 Township 39.0 N Range 9.0 W New Mexico P.M.

Well to be constructed on specified tract of land

PERMIT TO CONSTRUCT A NEW WELL

ISSUANCE OF THIS PERMIT DOES NOT CONFER A WATER RIGHT
CONDITIONS OF APPROVAL

1) This well shall be used in such a way as to cause no material injury to existing water rights. The issuance of this permit does not ensure that no injury will occur to another vested water right or preclude another owner of a vested water right from seeking relief in a civil court action.

2) The construction of this well shall be in compliance with the Water Well Construction Rules 2 CCR 402-2, unless approval of a variance has been granted by the State Board of Examiners of Water Well Construction and Pump Installation Contractors in accordance with Rule 18.

3) Approved pursuant to CRS 37-92-602(3)(b)(I).

4) The use of groundwater from this well is limited to fire protection, ordinary household purposes inside not more than 3 single family dwellings, the irrigation of not more than one acre of home gardens and lawns, and the watering of domestic animals and poultry. This well is to be located on that portion of the SW 1/4 of the NE 1/4 and the SE 1/4 of Section 13, Twp. 39N, Rng. 9W, NMPM. further described on Exhibit A, San Juan County.

5) The pumping rate of this well shall not exceed 15 GPM.

6) Pursuant to Rule 6.2.3 of the Water Well Construction Rules, the well construction contractor shall submit the as-built well location on work reports required by Rule 17.1 within 60 days of completion of the well. The measured location must be accurate to 200 feet of the actual location. The location information must include a GPS location (UTM coordinates) pursuant to the Division of Water Resources' guidelines.

7) ADVANCE NOTICE REQUIRED - Pursuant to Construction Rule 6.2.2.1 (2 CCR 402-2), licensed or private drillers and pump installers must provide advance notification (by 11:59 pm the day before) to the State Engineer prior to each of the following for this well: the start of well construction, the initial installation of the first permanent pump, and the initial installation of a cistern connected to the water well supply system. Any change in the date of construction/installation must be re-noticed prior to the activity (by 11:59 pm the day before). Information regarding the notification process and a link to the electronic notification form can be found on the Division of Water Resources website at dwr.colorado.gov

NOTE: This permit will expire on the expiration date unless the well is constructed by that date. A Well Construction and Yield Estimate Report (GWS-31) must be submitted to the Division of Water Resources to verify the well has been constructed. An extension of the expiration date may be available. Contact the DWR for additional information or refer to the extension request form (GWS-64) available at: dwr.colorado.gov

NOTE: Parcel Identification Number (PIN): 508913400000002

Issued By JEFF TITUS

Date Issued: 12/27/2021
Expiration Date: 12/27/2023

COLORADO
Division of Water Resources
Department of Natural Resources

WELL PERMIT NUMBER 324946
RECEIPT NUMBER 1001726D

COLORADO DIVISION OF WATER RESOURCES
DEPARTMENT OF NATURAL RESOURCES
1313 SHERMAN ST., Ste 821, DENVER, CO 80203
Main: (303) 866-3581 dwrpermitsonline@state.co.us

Office Use Only

Form GWS-44 (7/2012)

RESIDENTIAL Water Well Permit Application

Note: Also use this form to apply for **livestock watering**

Review form instructions prior to completing form.
Hand completed forms must be completed in black or blue ink or typed.

1. Applicant Information

Name(s)
Ozone Cubed CO, LLC

Mailing address
403 Corporate Wood Dr.

City	State	Zip code
Magnolia	TX	77354

Telephone (w/area code)	E-mail
985-414-1706	coopercollins@yahoo.com

2. Type Of Application (check applicable boxes)

- ■ Construct new well
- ☐ Replace existing well
- ☐ Use existing well
- ☐ Change or increase use
- ☐ Change source (aquifer)
- ☐ Reapplication (expired permit)
- ☐ Rooftop precip. collection
- ☐ Other: _____

3. Refer To (if applicable)

Well permit #	Water Court case #
Designated Basin Determination #	**Well name or #**

4. Location Of Proposed Well (Important! See Instructions)

County: San Juan

SW 1/4 of the NW 1/4

Section	Township	N or S	Range	E or W	Principal Meridian
13	39	☒ N ☐ S	9	☐ E ☒ W	NM

Distance of well from section lines (section lines are typically not property lines)

Ft. from ☐ N ☐ S Ft. from ☐ E ☐ W

For replacement wells only – distance and direction from old well to new well

feet Direction

Well location address (Include City, State, Zip) ☐ Check if well address is same as in Item 1.

TBD Hwy 550 N., Durango, CO 81301

Optional: GPS well location information in UTM format. GPS unit settings are as follows:

Format must be UTM
☐ Zone 12 or ☐ Zone 13
Units must be Meters
Datum must be NAD83
Unit must be set to true north
Was GPS unit checked for above? ☐ YES

Easting: _____
Northing: _____
Remember to set Datum to NAD83

5. Parcel On Which Well Will Be Located

(You must attach a current deed for the subject parcel)

A. You must check and complete *one* of the following:

- ☐ Subdivision: Name _____
  Lot _____ Block _____ Filing/Unit _____
- ☐ County exemption (attach copy of county approval & survey)
  Name/# _____ Lot # _____
- ☐ Parcel less than 35 acres, not in a subdivision attach a deed with metes & bounds description recorded prior to June 1, 1972, and current deed
- ☐ Mining claim (attach copy of deed or survey) Name/#: _____
- ☐ Square 40 acre parcel as described in Item 4
- ■ Parcel of 35 or more acres (attach metes & bounds description or survey)
- ☐ Other: (attach metes & bounds description or survey)

B. # of acres in parcel	C. Are you the owner of this parcel?
37.62	☒ YES ☐ NO _____

D. Will this be the only well on this parcel? ☒ YES ☐ NO (if no – list other wells)

E. State Parcel ID# (optional): 50891340000002

6. Use Of Well (check applicable boxes)

See instructions to determine use(s) for which you may qualify

- ☐ A. Ordinary household use in one single-family dwelling (no outside use)
- ■ B. Ordinary household use in 1 to 3 single-family dwellings:
  Number of dwellings: 3
  - ■ Home garden/lawn irrigation, not to exceed one acre:
    area irrigated 1 ☐ sq. ft. ☒ acre
  - ☐ Domestic animal watering – (non-commercial)
- ☐ C. Livestock watering (on farm/ranch/range/pasture)

7. Well Data (proposed)

Maximum pumping rate		Annual amount to be withdrawn	
15	gpm	3	acre-feet
Total depth		**Aquifer**	
300	feet	Unknown	

8. Water Supplier

Is this parcel within boundaries of a water service area? ☐ YES ☒ NO
If yes, provide name of supplier:

9. Type Of Sewage System

- ■ Septic tank / absorption leach field
- ☐ Central system: District name: _____
- ☐ Vault: Location sewage to be hauled to: _____
- ☐ Other (explain) _____

10. Proposed Well Driller License #(optional):

11. Sign or Enter Name of Applicant(s) or Authorized Agent

The making of false statements herein constitutes perjury in the second degree, which is punishable as a class 1 misdemeanor pursuant to C.R.S. 24-4-104 (13)(a). I have read the statements herein, know the contents thereof and state that they are true to my knowledge.

Sign or enter name(s) of person(s) submitting application	Date (mm/dd/yyyy)
	12/20/2021

If signing print name and title
Cooper Collins, Member

Office Use Only

USGS map name	DWR map no.	Surface elev.

Receipt area only

AQUAMAP
WE
WR
CWCB
TOPO
MYLAR
SB5

DIV _____ WD _____ BA _____ MD _____

COLORADO DIVISION OF WATER RESOURCES
DEPARTMENT OF NATURAL RESOURCES
1313 SHERMAN ST., Ste 821, DENVER, CO 80203
Main: (303) 866-3581 (informationline@state.co.us)

RESIDENTIAL (Note: Also use this form to apply for livestock watering)

Water Well Permit Application

Review form instructions prior to completing form.
Hand completed forms must be completed in black or blue ink or typed.

1. Applicant Information

Name(s)

Ozone Cubed CO, LLC

Mailing address

403 Corporate Wood Dr

City | State | Zip code

Magnolia | IX | 77354

Telephone (daytime) (area code) | E-mail

985-414-1706 | cooperscollins@yahoo.com

2. Type Of Application (check applicable box(es))

☒ Construct new well
☐ Replace existing well
☐ Use existing well
☐ Change or increase use
☐ Change source (aquifer)
☐ Reapplication (expired permit)
☐ Geothp precip. collection
☐ Other

3. Refer To (if applicable)

Well permit #

Water court no.

Designated basin (Determination #) | Well name or #

4. Location Of Proposed Well (Important! See instructions)

County

San Juan

Section | Township | N/S | Range | E/W

13 | 30 | N | 9 | W | NM

Distance of well from section lines (section lines can be found on county tax maps)

ft. from ☐ N ☐ S | ft. from ☐ E ☐ W

For replacement wells only: Distance and direction from old well to new well

Well location address (physical location, not mailing address) | City | Zip code

TBD Hwy 550 N, Durango, CO 81301

Option: GPS well location (required in UTM format, NAD 83 datum preferred)

Format: must be UTM

Zone 12 ☐ Zone 13

Units must be Meters

Datum: must be NAD83

Unit must be set to true north

Was GPS unit checked for above? ☐ Yes

Elevation (ft or meters) | Method of determination

5. Parcel On Which Well Will Be Located

(You must attach a current deed for the subject parcel)

A. You must check and complete one of the following

☐ Subdivision: Name

Lot | Block | Filing/Tract

☐ County exemption (attach copy of county approval & survey)

Name(s) | Lot #

☐ Parcel less than 35 acres, not in a subdivision (attach a deed with metes & bounds description created prior to June 1, 1972, and current deed)

☐ Mining claim (attach copy of deed or survey) Name(s)

☐ Dispute ID acre parcel as described in Item 4

☒ Parcel of 35 or more acres (attach copy of deed or survey)

☐ Other (attach metes & bounds description or survey)

B. # of acres in parcel | C. Are you the owner of the parcel?

37.62 | ☒ Yes ☐ No

D. Will this be the only well on this parcel? ☒ no ☐ No – list other wells

E. Date Parcel Split (optional) 5/08/1340/00/0000

Office Use Only | Form GWS-44 (12/2012)

6. Use Of Well (check applicable box(es))

Box indications to determine well(s) for which you may qualify

☐ A. Ordinary Household use in one single-family dwelling
(no outside use)

☒ B. Ordinary household use in 1 to 3 single-family dwellings

Number of dwellings 3

☒ Home gardening, irrigation, not to exceed one acre

Area irrigated 1 ☐ sq. ft. ☒ acre

☐ Domestic animal watering – (non-commercial)

☐ C. Livestock watering (on farm/ranch/range/pasture)

7. Well Data (proposed)

Maximum pumping rate | Annual amount to be withdrawn

15 gpm | 3 acre-feet

Total depth | Aquifer

300 feet | Unknown

8. Water Supplier

Is this parcel within the boundaries of a water service area? ☐ Yes ☒ No

If yes, provide name of supplier

9. Type Of Sewage System

☒ Septic tank / absorption field

☐ Central system. District name

☐ Vault. Sanitation service to be hauled by

☐ Other (explain)

10. Proposed Well Driller Licensa #(optional)

11. Sign or Enter Name of Applicant(s) or Authorized Agent

The making of false statements constitutes perjury in the second degree, which is punishable as a Class 1 misdemeanor pursuant to C.R.S. 24-4-104 (13)(a). I have read the statements herein, know the contents thereof and state that they are true to my knowledge.

Sign or enter name(s) of applicant(s) or authorized representative | Date (mm/dd/yyyy)

Cooper Collins, Member | 12/20/2021

Office Use Only

Receipt # | Date Rec'd | Deposit Amt.

Receipt # | Date Rec'd | Deposit Amt.

Aquifer

Use

Acres

GW WIs

Date | Initials | Date | Initials

Comments

COLORADO
Division of Water Resources
Department of Natural Resources
1313 SHERMAN ST, STE 821
DENVER, CO. 80203

RECEIPT

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OZONE CUBED CO, LLC
COOPER COLLINS
403 CORPORATE WOOD DR
MAGNOLIA, TX. 77354

Application/Receipt	Quantity	Description	Price	Extended Price
10017600	1	Exempt Well Permit Application - Outside DesB (Legacy Code: 11)	$100.00	$100.00

Subtotal:	$100.00
Service Fee:	$3.02
Total:	$103.02
(Credit Card) Tendered: [*7562]	$103.02
Change:	$0.00

Exempt Well Permit Application - Outside DesB (Legacy Code: 11)	Please allow 4-6 weeks for the processing of your application. Check the status of your application using the Application/Receipt number (not order number) at: https://dwr.state.co.us/tools/WellPermits

COLORADO

Division of Water Resources

Department of Natural Resources

1313 SHERMAN ST, STE 821

DENVER, CO 80203

RECEIPT

Date: 12/27/2021 10:02:51 AM Cashier: Y5220

Order Number: 12293

Transaction Number: 16705

OZONE CUBED CO, LLC

COOPER COLLINS

403 CORPORATE WOOD DR

MAGNOLIA, TX 77354

ApplicationReceipt	Quantity	Description	Price	Extended Price
1001700	1	Exempt Well Permit Application - Colorado Oil & Gas (Legacy Code: 11)	$100.00	$100.00

Subtotal:	$100.00
Service Fee:	$3.02
Total:	$103.02
(Credit Card) Tendered: [*7602]	$103.02
Change:	$0.00

Exempt Well Permit Application - Please allow 3-5 weeks for the processing of your application. Check the status of your Colorado Oil & Gas (Legacy Code: 11) application using the ApplicationReceipt number (not enter number) at: https://dwr.state.co.us/OGLW/WellPermits

Lambert and Associates
CONSULTING GEOTECHNICAL ENGINEERS AND MATERIALS TESTING

GEOTECHNICAL ENGINEERING FEASIBILITY AND GEOLOGIC HAZARD STUDY FOR PURGATORY 2000 PROJECT

DURANGO, COLORADO

Prepared for:

Purgatory Resort
Mr. Gary Derck and Mr. Jim Hards

PROJECT NUMBER: D00147GE

August 18, 2000

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1.0 INTRODUCTION

This report presents the results of the feasibility level geotechnical engineering and geologic hazard study we conducted for the proposed Purgatory 2000 project. The study was conducted at the request of Mr. Gary Derck and Mr. Jim Hards, Purgatory Resort in accordance with our proposal dated February 29, 2000 proposal.

The conclusions, suggestions and recommendations presented in this report are based on the data gathered during our site and laboratory study and on our experience with similar soil conditions. Factual data gathered during the field and laboratory work are summarized in Appendices A and B.

1.1 Proposed Development

The Purgatory-Durango Mountain Resort Improvements project consists of development of approximately 600 to 625 acres of property for multi-use purposes ranging from single family residential use to resort and multi-family dwellings. We understand that a waste water treatment facility is proposed to service the entire proposed development.

The current development plans are at a preliminary phase. Currently there are five (5) separate areas designated for single family residential use. These are; The Woodlands, Twilight Village, Boyce Lake Estates, and Cascade Ridge. Multi-family and use areas include; Base Camp Village, Purgatory Village, Columbine Station, and Gelande Station. We anticipate that the development plans and names will change as the project progresses.

1.2 Scope of Services

Our services included feasibility level geotechnical engineering field and laboratory studies, analysis, a design level pavement thickness study and report preparation for the proposed site. The scope of our services is outlined below.

- The field study consisted of describing and sampling the soil materials encountered thirty-three (33) test borings at the proposed project site.

- This report presents our considerations of the observed general feasibility level geotechnical engineering and geologic hazard study.

- The soil materials encountered in the test borings were described and samples were retrieved for the subsequent laboratory study.

- The laboratory study included tests of select soil samples obtained during the field study to help identify the swell and consolidation potential of the samples tested.

- Bulk samples were obtained from the test borings to assess the subgrade pavement section support characteristics of the materials sampled.

- Our recommendations and suggestions are based on the subsoil and ground water conditions encountered during our site studies.

- This report presents our considerations of the observed geologic hazards which may influence this site.

- The site characteristics to be studied are those outlined in the Geologic Hazard Colorado Geologic Survey Special Publication Number 6 which discusses H.B. 1041 and includes:

  . Avalanche
  . Landslide
  . Rockfall
  . Mudflow
  . Debris Fan
  . Unstable Slopes
  . Potentially Unstable Slopes
  . Seismic Effect
  . Radioactivity
  . Ground Subsidence, and
  . Expansive Soil and Rock.

- Our study does not provide design level geotechnical engineering parameters.

- Our study does not address any environmental issues,

2.0 SITE CHARACTERISTICS

Site characteristics include observed existing site conditions that may influence the geotechnical engineering aspects of the proposed site development.

2.1 Site Location

The site is located adjacent to, and surrounding the existing development and resort area at the Purgatory Durango Mountain Resort approximately twenty-five (25) miles north of Durango, Colorado. A project vicinity map is presented on Figure 1.

2.2 Site Conditions

The proposed project exists along about 12,000 lineal feet of US Highway 550 and ranged from about 1,600 to 4,000 feet wide. Since the project site covers a large area, we have provided a general description of each of the proposed developments within the project as named on the current plans. We have discussed some of the potential geologic and geotechnical engineering conditions which may influence each development below.

2.2.1 The Woodlands Site Conditions

The proposed Woodlands development area is located at the southwest portion of the project. The site may be generally characterized as rolling knolls with moderate to moderately steep slope areas. Some existing roadways are located on the project site. We used these existing roadways as part of our drill rig access.

We observed formational limestone cropping out at the ground surface and in many of the existing shallow excavation cuts along the existing roadways. We did not observe evidence of deep seated slope movement or instability in the Woodland development. The stability of much of the area is dependent on the strength of the shallow soil materials and the underlying limestone formational material. Portions of the Molas formation may be observed cropping out along the excavation cut slopes adjacent to Highway 550 near the western boundary of The Woodlands development.

The site is densely vegetated with spruce trees and ground foliage.

2.2.2 Twilight Village

The proposed Twilight Village development area is located north of The Woodlands Development along the eastern side of Highway 550. The Twilight Village development includes the existing Purgatory campground and the areas adjacent to the large pond north of the campground.

The slope areas above and to the east of the campground are steeper than thirty (30) percent. We did not observe evidence of slope movement or instability along the slope areas. As with the majority of the proposed project development, the soil mantle in the Twilight Village development appears to be relatively thin.

The vegetation in the Twilight Village development area consists of evergreen forest in the campground area and vicinity with sparse vegetation on the knolls adjacent to the large pond.

2.2.3 Boyce Lake Estates

The proposed Boyce Lake Estates development is perhaps the largest single portion of the proposed project. The Boyce Lake Estates development extends from the proposed Twilight Village development to the north project boundary adjacent to the existing Cascade Village Development and from Highway 550 to the eastern project boundary.

The proposed Boyce Lake Estates development generally exits on a relatively flat surfaced bench with rolling knolls and ridges with gentle to moderate slopes. The development is bounded along the east by steep slope and cliff exposures of the Leadville Limestone above Boyce Lake. A relatively prominent knoll exists near the northern portion of the development which may be remnants of a glacial moraine deposit.

Vegetation in the Boyce Lake Estates generally consists of sparse to moderately dense groves of Aspen trees and Spruce trees with moderate ground foliage. Limestone surface may be observed at the ground surface in some of the sparsely vegetated areas.

2.2.4 Cascade Ridge

The proposed Cascade Ridge development area is located along the western side

of Highway 550 and extends from the northern project boundary to the proposed Base Camp Village at the south. The lower portions of the Cascade Ridge development are located adjacent to Highway 550. The upper portions of the development include broad surfaced benches of the Hermosa Group formation. Cliff Exposures of the Hermosa Group may be observed along the central portions of the development, west of and above the Cascade flume, and above along the western project boundary.

We observed the Hermosa Group cropping out along many portions of the project site. Some areas of the fractured cliff exposures of the Hermosa Group may be a source for rockfall activity on the site. We observed colluvial soil accumulation near the base of the cliff exposures.

Vegetation on the site is dense in the low lying areas adjacent to Highway 550. The vegetation on the bench areas is sparse where the Hermosa Group formation is observed near the ground surface and becomes more dense in the areas of colluvial soil accumulation.

2.2.5 Base Camp Village, Purgatory Village, Columbine Station and Gelande Station.

From north to south, the Base Camp Village, Purgatory Village, Columbine Station, and Gelande Station generally encompass the balance of the proposed project development site. These four (4) areas of existing and proposed development generally includes the existing resort areas and areas to the south.

The proposed Base Camp Village is located along the lower lying areas adjacent to Highway 550. The Purgatory Village encompasses most of the existing development. Columbine and Gelande Stations are located along the Highway 550 area and includes the steeper slope area above.

Much of the existing development has been incorporated into the slope areas and on the formational exposures adjacent to cliff exposures of the Hermosa Group. As with much of the balance of the development, the shallow depth to the underlying rock formation influences the

slope stability. The stability of much of the area is directly related to the fracture patterns of the underlying limestone and sandstone units.

We understand that the Purgatory Ski area has an agreement with Public Service Company of Colorado to borrow water during the snow making season and return this water to the Cascade diversion during snow melt. This has been accomplished

through the years by a lined diversion ditch which traverses the sloped areas near Gelande Station. A small landslide occurred in the colluvial soils and road fill approximately three (3) to four (4) years ago. This landslide is a relatively small area below the access roadway to the existing Graysill development. It appears that a leak in the lined ditch saturated the downslope roadway fill areas which triggered additional downslope soil movement. The landslide is approximately fifty (50) to one-hundred (100) feet wide along the roadway and extends downslope approximately approximately 150 feet.

Vegetation in the area of these four (4) proposed developments consists of dense ground foliage and dense forested areas.

2.3 Subsurface Conditions

The subsurface exploration consisted of observing, describing and sampling the soil materials encountered in thirty-three (33) test borings throughout the project site. The approximate locations of the test borings and percolation test holes are shown on Figure 2 and 2a. The logs describing the soil materials encountered in the test borings are presented in Appendix A.

We encountered shallow soil deposits in most of the test borings. The soil mantle along the eastern portion of the project site ranges from about one-half (1/2) to three (3) feet thick. The shallow soils along the eastern portion of the project generally consists of sandy silt soils with varying amounts of gravel and cobbles.

We encountered a thick soil deposit in the vicinity of Test Boring thirteen (13) in the northern portion of the proposed Boyce Lakes Estates development. We suspect that this soil deposit may be related to past glacial processes in the area and may be a valuable resource for the proposed project development.

We encountered organic soil and peat deposits adjacent to the marsh areas on the project site. Generally the organic soil deposits adjacent to the wetlands areas ranged from a few feet thick to about eight (8) feet thick.

We encountered the Leadville Limestone underlying the site soils in the eastern portion of the project site and the Hermosa Group underlying the soils in the western portion of the project site. The Molas formation may be observed along the excavation cuts along Highway 550 near the proposed Woodlands development and near the northern end of the proposed project site.

We encountered subsurface water in some of our test borings at relatively shallow depths. The test borings where water was encountered at shallow depths generally existing near the

designated wetlands areas. We suspect that the subsurface water elevation and soil moisture conditions are influenced by seasonal conditions, snow melt and precipitation.

It is difficult to predict if unexpected subsurface conditions will be encountered during construction. Since such conditions may be found, we suggest that the owner and the contractor make provisions in their budget and construction schedule to accommodate unexpected subsurface conditions.

3.0 GENERAL REGIONAL GEOLOGY DISCUSSION

3.1 Introduction

The project site is located on the southern flanks of the San Juan Mountain Range and along the northern edge of the San Juan Basin. The area is characterized by relatively flat low-lying areas near the Colorado/New Mexico border, hogback ridges and foothills in the Durango and Bayfield areas, and the mountainous alpine areas north of Durango, Colorado.

The sedimentary beds are tilted to the south with the older geologic units exposed north of Durango and progress to younger units to the south. The oldest geologic units in the area are the Pre-Cambrian igneous and metamorphic formations north of Bakers Bridge and the youngest units are the Quaternary glacial and soil deposits. The Pre-Cambrian units east of Purgatory include the Twilight Gneiss, the Eolus Granite, and the Irving formation amphibolite complex.

The sedimentary units which are commonly encountered in the areas currently being developed in southwestern Colorado include; the Leadville Limestone, Pennsylvanian Hermosa Group sandstones and limestones, the Permian Cutler and Dolores formations, the Jurassic Morrison formation, the Cretaceous Dakota Sandstone and Mancos Shale, the Tertiary Animas and San Jose formations, and the Quaternary glacial and soil deposits.

The most commonly encountered units in the area include the Mancos Shale, the Animas formations, and the Quaternary gravel and soil deposits. The units underlying the project site consists of the Leadville Limestone, Molas Formation,

and the Hermosa Group Sandstones and Limestones.

The Leadville Limestone crops out along the eastern portion of the project site as cliffs and steep slopes and consists of hard, fractured limestone. Although limestone is generally associated with karst topography and karst features, there is not an abundance of karst features which we observed on the project site. A few of the low areas and depressions in the eastern central portions of the site may be solution pockets or sink holes.

The Molas Formation is an ancient soil deposit which formed due to weathering of portions of the Leadville Limestone. The unit is comprised of in Iron rich materials and limestone clasts and is highly unpredictable and irregular in thickness.

The Hermosa Group consists of interbedded sandstone, and limestone with some minor shale beds. Gypsum may be found in the unit south of the site which indicates that some evaporation of the oceans in the area occurred. The Hermosa Group sandstones and limestone crop out as massive cliff exposures along the west side of Highway 550 from Hermosa to the Purgatory area. The cliff exposures immediately in the project vicinity are not as massive as in the areas south of the site.

The quaternary glacial gravel and soil deposits are commonly encountered in southwestern Colorado in areas being developed. The glacial gravel deposits are common in the Durango area and as terrace deposits south of Durango. Alluvial gravel deposits are confined to areas close to the Animas and Pine Rivers. The glacial and alluvial gravel deposits typically high strength materials with a low swell potential when wetted. Other Quaternary soil deposits include alluvial silt deposits, particularly in the Animas Valley north of Durango and minor Eolian soil deposits.

A discussion of southwestern Colorado geology is presented in Appendix C.

4.0 GENERAL BACKGROUND DISCUSSION OF GEOLOGIC HAZARDS

This section of the report is intended to discuss the various geologic hazards which are not necessarily site specific which may be encountered when developing any parcel of land. The explanations are brief and are only intended to familiarize the reader with the definition of the basic generally formed hazards and the context in which they are discussed. The information is not intended to be site specific to the proposed subdivision.

In 1974 the Colorado Legislature passed House Bill 1041. The purpose of the bill, in brief, was to designate potential geologic hazards which, if present, may pose a threat to the loss of life and property. This section of the report provides a definition of these and other geologic hazards which were considered as part of this study. The definitions presented below are a paraphrased version of more lengthy discussion presented in Colorado Geological Survey Special Publication 6, "Guidelines and Criteria for Identification and Land-Use Control of Geologic Hazard and Mineral Resource Areas".

Site specific observed hazard considerations are presented in section 5.0.

4.1 Radioactivity

Several locations in western Colorado have been mined for radioactive elements and by-products such as, Uranium, Thorium, and Vanadium. Tailings from these mines are one of the chief sources of hazards due to radioactivity. Other sources of radioactive hazards are natural surficial deposits of ore laden with radioactive elements and the sun. The emission of radiation may consist of the release of Alpha or Beta particles or Gamma rays. The radiation is released as part of the decay of a radiometrically unstable isotope. As this decay occurs, by products are produced. Gaseous radioactive substances, such as radon, are common radioactive hazards.

Site specific radioactivity hazard considerations are presented in section 5.1.

4.2 Seismic Effects

Hazards from diastrophic (earth movement) activity are any effects that may be directly or indirectly related to earthquakes. The effects of a formidable earthquake may be ground displacement, ground shaking, ground failure, abnormal water wave action and a host of other less prominent effects. Most of the State of Colorado is classified as a Zone 1 seismic risk on maps in the Uniform Building Code and other references. Zone 1 seismic risk areas are considered as low risk areas for hazards for seismic effects. The seismic risk zone map is presented on Figure 3. A small part of Colorado, in the vicinity of Pagosa Springs, is Zone 2B, most likely because of a recent event centered in Dulce, New Mexico.

In general, Colorado has had various sequences of seismic activity in the past. Initial seismic activity was associated with the relief of stresses during the uplift of the ancestral Rockies, during Paleozoic times. During the Cenozoic

period little seismic activity occurred. Many of the fault trends associated with the uplift of the ancestral Rockies were fractured during the Neogene in association with the Laramide orogeny. An orogeny is a mountain building episode. The Laramide orogeny occurred about 68 to 75 million years ago and is credited with the formation of our current Rocky Mountains.

Recent activity, though mild, has occurred in the Montrose and Ridgway areas north of the San Juan Mountains and in the Dulce, New Mexico area south of Pagosa Springs.

Site specific seismic considerations are presented in section 5.2.

4.3 Ground Subsidence

Ground subsidence may be caused by man or natural processes. Subsidence of the ground surface may be attributed to collapsible soils, failure of subsurface voids, removal of subsurface fluids, or mining activities. Collapsible soils may cause settlement of structure, however, geotechnical analysis and foundation design have advanced considerably in the past decade and engineering procedures for dealing with collapsible soils is available. Subsurface voids may be caused by hydrothermal or mining activity. The presence of subsurface voids may be recognized through subsurface exploratory drilling and often surficial topographic evidence of such voids may be observed.

Site specific ground subsidence information is presented in Section 5.3.

4.4 Landslides

"Landslide" is a term that is used in an extremely broad scope. Generally speaking, a landslide is the mass movement of a unit of material as a somewhat singular body. Commonly a landslide will move, or fail, on a semi-circular arc or on a plane. Features that are common to most landslides are; the main scarp, which is where the upper portion of the failure plane intersects the ground surface; transverse or extension fractures, this is the area of the slide that is usually in the lower third of the mass where bending of the materials occur; and the toe, this is the bottom of the slide which is often a lobate bulge in the ground surface. Landslides can encompass very large masses of soil, some covering several acres in size while others only encompass a few hundred square feet. Smaller movements are often referred to as slumps.

Site specific landslide considerations are presented in Section 5.4.

4.5 Avalanches

Avalanches are a common process in the Rocky Mountains and adjacent areas in the high country of Colorado.

There are three primary zones within an avalanche path. The zone of accumulation and failure exists at the highest elevation in an avalanche path (usually 20 degrees to 45 degrees slope gradient). This is the area where the avalanche begins. As the snow moves downslope it travels through the track which can be a relatively narrow chute which may be easily identified in the field, on topographic maps, and on areal photographs. The snow loses velocity and subsequently stops in the runout zone (usually less than 20 degrees slope gradient). The runout zone may also be easily identified in the field, on maps or photographs. Avalanches commonly occur at elevations in excess of 8,000 feet above sea level.

Avalanche considerations for this site are discussed in Section 5.5.

4.6 Rockfall

Rockfall is a hazard that may occur in areas where a rock becomes detached from a larger rock body or slope and moves downslope by the force of gravity. The movement of a singular rock may trigger the movement of other rocks downslope. Hazards from falling rocks generally occurs in areas beneath steep slopes or cliffs.

Rockfall hazard considerations for this site are presented in Section 5.6.

4.7 Flooding

Flooding of streams occurs when the gradient and size of the stream channel is not large enough to accommodate the amount of water flowing in the channel, therefore, water flow outside of the channel occurs.

Flooding considerations for this site are presented in Section 5.7.

4.8 Mudflows and Debris Fans

Mudflows are the mass movement of saturated soils downslope under the force of gravity. Debris fans occur under the same set of conditions, but the shape of the flow will be wider at the bottom due to decreased energy from slope gradient

changes which gives the flow a "fan" appearance when viewed from above.

The site specific debris fan and mud flow considerations are presented in section 5.8.

4.9 Expansive Soil and Rock

Expansive materials are soils or rock that will experience volume changes as conditions such as moisture content and load are varied in or on them. Materials with clay are usually the most likely to exhibit expansive characteristics, however, a soil that is predominately sand, which is typically non-expansive, may exhibit expansive characteristics. A small amount of clay within the material matrix can expand and exert expansion forces throughout the sand. There are several design and construction techniques that may be used to reduce the effect of expansive soils.

Site specific expansive soil and rock considerations are presented in Section 5.9.

4.10 Slopes

An unstable slope may be considered as a slope that, due to natural factors, exhibits deterioration or movement of the materials within the slope. The movement of a slope is distinguished from a landslide in that a landslide will have a distinct failure plane which may or may not be evident in slope movement. Generally speaking, slope movement is a slow, continual movement whereas a landslide will be relatively rapid and occurs in intervals as the stresses required to cause failure become large. The natural factors often concerned with the destabilization of a slope are; slope angle, surface and subsurface water, seismic effects, and the nature of the material involved. Slope stability may be further influenced by construction and engineering. Careful planning, engineering, and construction may promote a more stable condition within a slope while unplanned development may decrease the stability of the slope.

Site specific slope stability considerations are presented in Section 5.10.

5.0 GEOLOGIC HAZARDS DISCUSSION

This section of our report discusses the observed site geologic hazards in the same order as they were discussed above. Potential mitigation concepts and suggestions for continued engineering assessment are presented for each of the

observed hazard conditions.

The information presented below is based on field observations, literature research, observations of topographic maps and on discussions with other members of the project development design team.

5.1 Radioactivity

There were no signs of naturally occurring radioactive mineral, rock deposits, or mine tailings observed on the site at the time of the field observations. Based on our observations

we do not feel that there is a potential for hazards from radiation on the site. A radiation survey was not included in our scope of work. A more detailed radiation survey may be performed if desired by the owner, at additional cost.

Measures to reduce radon levels in residential structures include vented crawl spaces with vapor barrier at the surface of the crawl space to restrict radon gas flow into the house or a vented gravel layer with a vapor barrier beneath a concrete slab-on-grade floor to allow venting or radon gas collected beneath the floor and to restrict radon gas flow through the slab-on-grade floor into the structure. These concepts are shown on Figure D1 in Appendix D.

Information presented in "Radon Reduction in New Construction, An Interim Guide" OPA-87-009 by the Environmental Protection Agency dated August 1987 indicates that currently there are no standard soil tests or specific standards for correlating the results of soils tests at a building site with subsequent indoor radon levels. Soil radon tests are only indicators of the potential for site soils to produce radon gas. Actual indoor levels can be affected by construction techniques and may vary greatly from soil radon test results. Therefore it is recommended that radon tests be conducted in the home after construction is complete to verify the actual radon levels in the home.

If you have any questions or would like more information about radon please contact us or the State Health Department at 303-692-3030.

5.1.1 Mitigation/Assessment

If individual lot or project owners require a more in depth analysis of potential

radiation sources, including measurement of site background radiation, we suggest that this be done on a lot specific basis.

5.2 Seismic Effects

Labeled faults approximately sixty (60) miles north-northeast of the site are the 95Mi/P and 96Mi/H fault complexes near Lake City, Colorado. The fault labels are from Colorado Geological Survey Bulletin 43, "Earthquake Potential in Colorado". The fault number is followed by letters, the letters signify the oldest and youngest units displaced by the fault, or in the case of only one letter, the most recent movement.

The labeled faults are associated with the Uncompahgre block uplift and have displaced Quaternary period geologic units. (Kirkham, Rogers, 1981). The location of the faults is presented on Figure 4.

5.2.1 Mitigation/Assessment

Based on the information we have obtained and the site observations we do not feel that significant hazard such as rupture or significant shaking associated with seismic activity are likely on this site.

5.3 Ground Subsidence

There does not appear to be any large scale mining features on or near the site. There was no evidence of excavations significant enough to pose a hazard.

5.3.1 Mitigation/Assessment

We do not anticipate that ground subsidence is likely to influence this development. Geotechnical engineering analysis and recommendations should be conducted on a lot specific basis to further assess the soil conditions and their influence on the proposed construction.

5.4 Landslides

Landslides are common in southwestern Colorado. Landslides are typically located in areas prone to moisture accumulation in sloped soil deposits or on formational materials bedding planes. Soils such as clays or silts have lower strength characteristics and are more prone to movement. Landslides may be associated with natural subsurface moisture, such as springs, or due to irrigation or other man-generated sources.

The only area observed and designated as a landslide deposits is located along the roadway fill areas adjacent to the lined water ditch south of the existing Graysill development. Generally the soil mantle on the project site is relatively thin with isolated areas of thicker soil deposits. The soils on the project site are typically have a silt or sand-silt matrix and have relatively high strength characteristics.

5.4.1 Mitigation/Assessment

Based on our information we do not feel generally feel that landslides exist on or influencing the site. The man-caused landslide along the water ditch along the roadway south of the Graysill development demonstrates the potential for soil movement associated with loose fill material and with substantial introduction of water.

We feel that the site specific geotechnical engineering assessment of each of the proposed developments will be able to designate particularly sensitive areas for landslide potential as the plans progress. It may be prudent to incorporate subsurface drain systems into the proposed utility trench design in areas where subsurface utilities are placed on steeper slope areas where significant soil deposits exist.

5.5 Avalanches

We did not observe evidence of existing or historic avalanche activity. We understand that there has not been a history of avalanche activity in the Purgatory area. We suspect that a remote potential for avalanche activity is possible due to the project elevation and slope inclination. The slopes above the proposed development areas are relatively limited in extent and do not extend to significant elevations above the project site.

5.5.1 Mitigation/Assessment

Based on our information we feel avalanche hazard does influence the proposed development.

5.6 Rockfall

Rockfall hazards exist in areas below talus slopes, loose boulders, or more commonly below fractured cliff exposures of formational material. We observed

massive fractured exposures of the Hermosa Group in the areas near the switchback of the Hermosa Park National Forest Service Roadway above the proposed Cascade Ridge development. We observed evidence of ancient rockfall activity which consists of large blocks and boulders of material which have accumulated near the slope/bench transitions along the western portion of the proposed project.

We analyzed the potential energy associated rockfall activity of various size rock which we observed on the ground surface at the project site. We used the data obtained during the field work and the Colorado Rock Simulation Program (CRSP-3) to analyze the rockfall probability and potential at the project site.

The portions of the project site which may be influenced by rockfall activity are limited to the west side of the Cascade Ridge development area and a portion of the alluvial fan southwest of the proposed maintenance areas southwest of the proposed Gelande Village area. We did not observed evidence of recent rockfall activity influencing any portion of the currently proposed structure locations. We performed a detailed analysis of the potential rockfall activity below the fractured cliff areas above the central portion of the west side of the proposed Cascade Village development.

Rocks smaller than about twelve (12) inches in nominal dimension do not typically have sufficient energy to pose a serious threat to structures, however the potential direct danger to humans on the slopes areas is implicit. Based on our field data and the computer modeling and simulation rocks smaller than about twelve (12) inches do not reach the currently planned proposed structure locations. Approximately thirty-six (36) percent of the rocks with a nominal dimension of sixteen (16) inches reached the proposed structure location. A tabulation of some of the computer modeling data is tabulated below.

Rock Diameter (inches)	Percent of Rocks Analyzed to Impact Structure Site	Energy of Impact at Structure Site (Foot-Pounds)	Maximum Bounding Height of Rock at Structure Site (feet)
6	0	--	--
9	0	--	--
12	0	--	--

14	0	--	--
16	0	--	--
18	0	--	--
24	3	1,882	1.0
36	100	172,468	7.0
48	100	567,378	10.0
96	100	7,707,441	6.0

Although the computer modeling and the information tabulated above is useful in assessing the potential energy associated with rockfall activity of the site, it does not provide information regarding the actual potential for rockfall events.

We did not observe a significant number of rocks, or evidence of previous rockfall activity on the project site. We did observe some blocks of rock which were on and near the site which are likely rockfall events which occurred after recession of the glacial ice in the valley approximately 10,000 to 12,000 years ago.

Based on our field work we feel that the rocks produced by spalling of the cliff exposures above the site which may influence the proposed structure location range from about nine (9) inches to about several feet with an estimated mean rock size of about two (2) to three (3) feet. Due to dense vegetation previous rockfall activity has not significantly influenced the proposed structure locations.

We observed the cliff face and adjacent areas. The cliff areas observed included fractured exposures of the Hermosa Group. Some areas of the cliff exposures had undercut portions of rock with a moderate fracture density. Rockfall activity in the near vicinity of the cliff exposures is greater than in the lower elevations of the slopes below. The western portion of the Cascade Village development is a relatively flat area with an abrupt slope inclination transition near the western property boundary. The flat areas of the site decrease the energy associated with rockfall events rapidly.

We observed large blocks of rock which have toppled from the cliff above and currently rest near the toe of the slope below the cliff areas. Some larger rocks have weathered to produce a relatively unique irregular hummocky ground surface expression near the toe of the slope. We advanced test borings through some of the irregular slope areas to assess the subsurface conditions. It appears that some of the hummocky areas may be highly weathered blocks of rock which may have originated from the areas above.

5.6.1 Mitigation/Assessment

Although we do feel that the proposed building locations on the west side of the Cascade Ridge development may be exposed to infrequent rockfall events, we do not feel that a regular hazard influences the site. There always exists the possibility that large, rare, rockfall events may occur, which are nearly impossible to predict.

Mitigation of the rockfall activity ranges from placement of arrest structures to strategic architectural design of the proposed structure. Upslope arrest structures include fencing or other barriers to stop rockfall activity before the rocks move downslope. Strategic architectural concepts include structural reinforcement of roofs and upslope walls and placement of high occupancy rooms away from potential rock impact areas.

We feel that strategic architecture should be included in the design of the proposed structures along the west side of the proposed Cascade Ridge development area. We suspect that it may be possible to incorporated structural reinforcement concepts for smaller rocks, however the impact energies of the larger rocks may not be able to be mitigated. Site specific rockfall assessment and design should be incorporated into the future plans for projects along the western side of the proposed Cascade Ridge development.

5.7 Flooding

There are no significant drainages on the project site, however the site is located in an Alpine area where significant rainfall events are common. We anticipate that some of the lower lying areas adjacent to wetlands may be influenced by highwater conditions depending on seasonal conditions.

5.7.1 Mitigation/Assessment

We do not feel that a flooding hazard directly influences this project site, however site specific civil engineering and drainage design should be included in the project design and development.

5.8 Mudflow and Debris Fans

There is a alluvial fan deposit located south of, and near the Gelande Station portion of the proposed project. We found an incised channel near the apex of the alluvial fan, we were not able to find a defined stream course on the lower elevations of the alluvial fan deposit during our field work. The drainage channel of the intermittent stream above the alluvial fan deposit may be observed on the

project topographic maps. The drainage basin of the intermittent stream is relatively limited in extent. We did not observe evidence of high flow event deposition on the alluvial fan. We suspect that the alluvial fan deposit is a result of incremental soil deposition over a long period of time, rather than catastrophic debris flow type of deposition.

5.8.1 Mitigation/Assessment

Although we do not feel that a debris flow type of event is a significant hazard, we do feel that some measures should be taken on the alluvial fan deposit to direct stream flow away from the proposed structures. The stream channel should be directed away from the proposed areas of use on the alluvial fan. The channel size should be based on the probable maximum amount of flow from the drainage which has deposited the fan. The channel size should be designed by a hydrologist or a civil engineer with hydrology expertise. The channel should be maintained through the life of the project. If the channel becomes blocked due to a debris flow event, it should be immediately cleared to allow for potential flow from a future event.

The current plan for use of the area below and on the alluvial fan deposit is for a maintenance facility. We feel that this proposed use of the area is more suitable than use for residential type dwellings. If the plans change and residential type development is proposed for the area, a more rigorous mitigation may be considered.

5.9 Expansive Soil and Rock

We encountered shallow soil deposits in our test borings. The soils encountered consists of colluvial soils due to local weathering and deposition. We did not encounter clay soils in our test borings.

5.9.1 Mitigation/Assessment

We do not feel that expansive soils influence the proposed building sites. There are often soil conditions and site characteristics other than expansive soils which influence the foundation and site development design plans. We suggest that site specific geotechnical engineering studies be considered if individual lot owners desire specific geotechnical engineering.

5.10 Slopes

Our analysis of the slope stability conditions at the project site included;

- field observations of the slope geometry and geomorphology,
- field exploration and test borings in the vicinity of the slope areas,
- assessment of the strength of the materials encountered on the project site near the slopes, and,
- computer modeling the existing slope and proposed structure locations using the modified Bishops Method of Slices for slope stability assessment and general slope stability assessment techniques.

With exception to the small landslide caused by a leak in the lined ditch discussed above, we did not observe over steepened areas, tension fractures, or other signs of deep soil or slope movement. We anticipate that soil creep, or slow movement of the near surface soils may be occurring on some of the steeper slope areas on the project site.

5.10.1 Existing Slope Stability Assessment

We obtained soil samples of the materials encountered in the test borings. The soil strength parameters phi, (φ) and cohesion (C), were assessed using direct shear strength test methods in our laboratory. The strength parameters of each type of soil tested were used in conjunction with the slope profiles generated from the topographic map provided to us by Goff Engineering to assess the slope stability. We used the modified Bishops Slice, and infinite slope methods in our analysis.

Generally the soil mantle in the project site is a thin layer of silts and sand overlying either limestone or sandstone. We found that the Hermosa Group Sandstone crops out as cliffs and steep slopes on the western portion of the project site and the Leadville Limestone Crops out as cliff exposures on the eastern side of the project site. We encountered thicker soil deposits at the slope transition zone at the base of some of the steeper slopes and cliff areas on portions of the project site. These accumulations of soil are commonly referred to as colluvial wedges. We assessed the slope stability conditions along three (3) cross sections in the colluvial wedge areas where we either had subsurface data from our test borings, or the subsurface characteristics could be ascertained by surficial observations.

We did not observe evidence of large scale slope movement on the project site. Due to the shallow depth of soil on the project site we feel that the stability of the steeper sloped areas on the project site is dominantly influenced by the

geologic structure characteristics of the underlying limestone and sandstone formations.

We suspect that any likely movement of the sloped areas on the site would be confined to relatively small areas due to the limited thickness and extent of the soil mantle. If slope movement occurs it may either occur as translational movement of the soil along the underlying contact with the formational material, or as failure within the mass of thicker soil deposits. The analysis provided here should provide some general insight and background information for the project slope stability conditions. As the project progresses site specific slope stability assessment should be conducted as needed.

We performed direct shear strength tests on the soil samples obtained from the test borings. The strength parameters used in our assessment are tabulated below.

Sample I.D.	Material Type	Angle of Internal Friction (Degrees)	Cohesion (Pounds Per Square Foot)
TB3 @ 3'	Sand, silty	17	170
TB17 @ 0-4½'	Sand, weathered sandstone	24	150
TB21 @ 4-15'	Silt and Sand	pending	

5.10.2 Infinite Slope Stability Analysis

There are several potential modes of failure of the sloped areas of the project site. The Leadville Limestone and the Hermosa Group Formations are exposed at the ground surface and exist at shallow depths below the ground surface on the upper slope. If the shallow soils become saturated the weakest mode may be along the soil/formation interface. We performed simple infinite slope stability analysis to assess the theoretical factor of safety of the slope assuming a relatively planar failure surface along the entire height of the slope at soil depths ranging from three (3) to seven (7) feet below the ground surface. We calculated a theoretical factor of safety for slopes with a soil mantle thickness in excess of a likely scenario as part of our assessment. This approach allows

us to establish a trend, and to assess the sensitivity of the analysis to various factors. The steeper slope areas currently proposed for development include slopes with inclinations in the range of about twenty (20) degrees. The results of our infinite slope stability analysis for a twenty (20) degree slope are tabulated below. The assessment tabulated below assumes no pore pressure exists in the soil at the interface with the underlying shale materials. Accumulation of pore pressure in the site soils will decrease the soil strength and the stability of the sloped areas. The theoretical analysis model we used for the infinite slope stability assessment is shown on Figure 5.

Infinite Slope Stability Analysis Results

Infinite Slope Stability Analysis, slope angle of twenty (20) degrees, No Pore Pressure

Thickness of Soil Mantle (Feet)	Theoretical Slope Factor of Safety
3	2.25
5	1.69
7	1.44

We did not encounter free subsurface water in our test borings advanced on this project site, nor did we encounter free subsurface water in our test borings on the adjacent project. It is possible that during the life of the project a potential may exist for development of pore pressures within the soil mantle. We suspect that the most likely scenario for development of pore pressures will be a rapid infiltration of water into the sloped soils due to snow melt and/or precipitation. It is difficult to estimate or predict the potential for development of pore pressures in the soil materials, which are likely to drain quickly, without additional information.

The infinite slope stability analysis is a convenient method to assess the general slope stability conditions along sloped areas, however since it is not always realistic for an entire slope mass to have a uniform soil thickness and for the entire slope to become involved in a singe slope movement event, the method often provides a lower theoretical factor of safety than other methods.

The bedding planes of the underlying formational materials are relatively flat. The surface of the formational material under the sloped soils is likely to be

a blocky and irregular surface similar to the exposures of the formational material observed on the cliff exposures near the site. These types of surfaces do not promote soil movement as would planer surfaces.

5.10.3 Modified Bishops Method Of Slices Analysis

Our stability analysis of the site slope soil material was based on the Bishops Method of Slices. This method is based on the assumption that the slope soil mass will fail in a rotation mode on a circular arc plane. In this method of analysis the mass of soil is divided into vertical slices. The forces acting on each slice are evaluated from the equilibrium of the slices; that is, the forces that tend to drive the slice downhill and the forces that tend to resist the movement of the slice. The equilibrium of the entire mass is determined by summing driving and summing the resisting forces acting on all slices and comparing these forces.

The modified Bishops Method of Slices is based on a theoretical hemispherical failure plane of the soil mass. We generally utilize this method for assessment of slope stability conditions
where deep deposits of soil with uniform strength characteristics exist. We used the modified
Bishops method to assess the shallow soil stability considerations on the steeper sloped areas assuming the underlying geologic formations are at a shallow depth. We assessed large scale, or global stability of the steeper slopes area based on the potential for mass movement of the entire slope area.

The modified Bishops Method of Slices provides a means to assess the internal forces in a sloped soil mass. The forces may be grouped into two (2) general categories, those that tend to drive the soil mass movement and those that resist soil mass movement. The ratio of resisting forces to driving forces is commonly referred to as the slope theoretical factor of safety. If the resisting forces are greater than the driving forces the theoretical factor of safety is greater than one (1). If the resisting forces are equal to the driving forces, the theoretical factor of safety is equal to one (1), minor changes in the soil moisture content or slope conditions might cause movement. If the driving forces exceed the resisting forces the theoretical factor of safety is less than one (1)and the slope is currently in a failure condition
with periodic movement. The engineering community considers a theoretical factor of safety greater than 1.5 as stable and those ratios between 1.0 and 1.5 as marginally stable. Many institutions and roadway engineering design manuals consider a theoretical factor of safety of greater than 1.2 as acceptable for design purposes. The theoretical factor of safety used in design is influenced

by the confidence level of the data obtained on the sloped areas. Depending on the importance of the areas adjacent to a slope and the confidence level of the analysis used a theoretical factor of safety of less than 1.5 may be used as a basis for assessment used where design of retaining structures or slope reinforcement is planned. Our
analysis presented here is a cursory assessment of the slope stability conditions at the site. This study does not provide parameters for design of slope stability retaining structures or reinforcement.

Our slope stability analysis was performed using "Stabl/G, Slope Stability Analysis", by Geosoft Computer Software. Our slope stability analysis considered three (3) different actual cross section locations which are shown on Figure 6. We also analyzed theoretical cross sections to assess general sensitivity issues with regard to strength parameter and the potential for local steeper slope areas. Our sensitivity analysis of the data is not included with this letter, but is available if needed. Several thousand separate failure surface iterations were performed to help identify the potential theoretical slope stability. Our discussions and data presentation is based only on the calculated critical circle which presented the lowest factor of safety against failure. Iterations with higher theoretical factors of safety do not provide a assessment of the critical slope stability conditions and are therefore not included in this discussion.

We performed sensitivity analysis throughout our study by varying all of the data input parameters and observing the results of such variations. The variations in our analysis produced relatively small and predictable changes to the calculated theoretical factor of safety
indicating that the stability analysis was not sensitive to slight variances in the soil strength characteristics. There was not a basis for inclusion of pore pressure values in our analysis. There was no evidence of current active failures along the sloped areas.

5.10.3.1 Cross Section Analysis Discussion

The cross sections we analyzed were located in areas where soil deposits were known to exist based on our field exploration and/or observations. Many areas of the project site have exposures of formational material exposed on the slopes or cliff areas. The structural characteristics and joint patterns will influence the slope stability in the areas of shallow formational material. The modified Bishops Method is an appropriate method for analyzing the slope stability in areas of soil deposits. Computer and mathematical modeling of formational material may not possible due to the unpredictable nature of joint and fracture patterns

within the frock mass.

The existing theoretical factor of safety of the steeper sloped areas analyzed are tabulated below. The computer cross sections and analysis are presented on Figures 7 through 9.

Cross Section Designation	Theoretical Factor of Safety
A	1.26
B	1.21
C	1.35

Our analysis were conducted in areas of significant soil thicknesses on the steeper sloped areas. The areas of theoretical slope movement represented by the analysis occurred in relatively small areas on slopes with inclinations of about two to one (2:1, h:v), about twenty-five (25) degrees and steeper. The current plans do not include development on these steeper sloped areas. The results of the analysis of the steeper slope areas are included here to help illustrate the need for future site specific slope stability analysis for steeper sloped areas which may be proposed for later development.

5.10.1 Mitigation/Assessment

There are numerous types of foundation configurations and depths which may be appropriate for consideration on this project site. We suggest that site specific geotechnical engineering studies which incorporate the actual proposed construction and lot development plans be considered to better define the stability of each of the proposed structure sites. We do not feel that there is a large scale slope stability concern for the currently proposed development areas.

We suspect that some roadways and infrastructure may cross or exist adjacent to steeper slope areas. The existing landslide which was caused by the leak in the liner of the water ditch south of the existing Graysill development is an illustration of the effect of concentrated water on the slope stability conditions of the fill material of the roadway.

Subsurface drain systems may be incorporated in the project utility trench design to reduce the influence of a potential water leak on the slope stability. The plans for the utility line trenches may incorporate a washed aggregate material for the bedding material which may double as use for a subsurface drain media. A perforated pipe placed in the drain media may be graded to gravity flow surface outlets along the sloped areas adjacent to the utility line trench. The drain system may be designed as discussed later in this report. Bulkheads should be placed periodically along the utility line subsurface drain system to allow for identification and location of leaks as part of the project maintenance plan. We are available to discuss this concept further with the design team as the project plans progress.

6.0 GEOTECHNICAL ENGINEERING FEASIBILITY DISCUSSION

This section of our report presents our geotechnical engineering feasibility level considerations for the proposed development.

The conclusions, suggestions and recommendations presented in this report are based on the data gathered during our site and laboratory study and on our experience with similar soil conditions. Factual data gathered during the field and laboratory study are summarized in Appendices A and B.

6.1 General On-site Construction and Development Considerations

We anticipate subsurface water elevation may fluctuate with seasonal and other varying conditions. Excavations may encounter subsurface water and soils that tend to cave. It may be necessary to dewater construction excavations to provide more suitable working conditions. Excavations should be well braced or sloped to prevent wall collapse. Federal, state and local safety codes should be observed.

6.2 Foundation Planning and Considerations

Two criteria for foundation design which must be satisfied for satisfactory performance are:

1) contact stresses must be low enough to preclude shear failure of the foundation soils which would result in lateral movement of the soils from beneath the foundation, and

2) settlement or heave of the foundation must be within amounts tolerable to the superstructure.

The soils encountered in the test borings have varying engineering characteristics that may influence the design and construction considerations of foundations. The characteristics include swell potential, settlement potential, bearing capacity and the bearing conditions of the soils supporting the foundations. These are discussed below.

6.2.1 Swell Potential

Some of the materials encountered in the test borings at the anticipated foundation depths may have swell potential. Swell potential is the tendency of the soil to increase in volume when it becomes wetted. The volume change occurs as moisture is absorbed into the soil and water molecules become attached to or adsorbed by the individual clay platlets. Associated with the process of volume change is swell pressure. The swell pressure is the force the soils applies on its surroundings when moisture is absorbed into the soil. Foundation design considerations concerning swelling soils include structure tolerance to movement and dead load pressures to help restrict uplift. The structure's tolerance to movement should be addressed by the structural engineer and is dependent upon many facets of the design including the overall structural concept and the building material. The uplift forces or pressure due to wetted clay soils can be addressed by designing the foundations to account for swelling soils.

6.2.2 Settlement Potential

Settlement potential of a soil is the tendency for a soil to experience volume change when subjected to a load. Settlement is characterized by downward movement of all or a portion of the supported structure as the soil particles move closer together resulting in decreased soil volume. Settlement potential is a function of foundation loads, depth of footing embedment, the width of the footing and the settlement potential or compressibility of the influenced soil. Foundation design considerations concerning settlement potential include the amount of movement tolerable to the structure and the design and construction concepts to help reduce the potential movement.

6.2.3 Soil Support Characteristics

The soil bearing capacity is a function of the engineering properties of the soils supporting the foundations, the foundation width, the depth of embedment of the bottom of the foundation below the lowest adjacent grade, the influence of the ground water and the amount of settlement tolerable to the structure.

Foundations for the structures should be placed on relatively uniform bearing conditions. Varying support characteristics of the soils supporting the foundation may result in nonuniform or differential performance of the foundation. The influence of nonuniform bearing conditions may be reduced by recognizing and accommodating during the site specific design.

6.3 General Foundation Considerations

We anticipate that several foundation types are available for future structures. These include: spread footings, structural concrete mat foundations and drilled pier foundations. Either spread footings, mat foundations, or drilled piers may be used as a potential foundation system for many of the proposed structures. These are discussed in general below.

6.3.1 Spread Footings

Spread footing design will depend on site and structure characteristics discussed above. Spread footing design parameters should be determined on a site and structure specific basis. We anticipate that the soil bearing capacity for spread footings may range from about 1,000 to 2,000 pounds per square foot. The foundation design may need minimum design dead loads based on site and structure specific test data generated for the planned structures. These values and other site specific design parameters should be determined for each building site and tailored for each structure.

Expansion and settlement characteristics of the foundation support soils should be tested for each building site and the anticipated post construction settlement analyzed on a site and construction specific basis.

Due to the anticipated settlement potential of some of the site soil materials we feel that spread footings may experience post construction movement due to

volume changes of the soils supporting the foundations. Drilled pier foundations may provide foundation systems with the least likelihood of post construction movement.

6.3.1.1 General Spread Footing Considerations

We should be contacted to perform a site and structure specific geotechnical engineering study for each proposed building site prior to foundation design to provide site specific geotechnical engineering design and construction suggestions and recommendations.

6.3.2 Drilled Piers

Drilled piers supported by the Animas formational material may be a viable foundation system design. Drilled or formed piers supported by either the Leadville Limestone or the Hermosa Group materials should provide adequate support for structures on the project site. Due to the hardness of the materials encountered we suspect that specialty drilling equipment will be needed if piers need to be drilled into the formational material. Drilled pier and grade beam foundation systems are not influenced to the same degree by the shallow soil conditions as spread footings or other shallow foundation design concepts. Drilled piers may be a more viable foundation design consideration for areas adjacent to the wetlands areas where soft soil conditions were encountered.

Drilled pier and grade beam foundation systems have proven a viable foundation system design for most sites. The drilled pier and grade beam foundation system particularly useful where the shallow soil conditions are not favorable for use of a conventional spread footing and stem wall system.

Additional site specific geotechnical engineering exploration is needed to assess drilled pier end bearing elevations and their associated load capacity values.

If ground water is encountered, the pier holes should be dewatered prior to placing pier concrete. It may be necessary to case the pier holes with temporary casing to prevent caving during pier construction.

6.3.3 Mat Foundations

Mat, or raft, foundations are suitable for sites with soft, low strength soils. Mat, or raft, foundations may be a viable foundation system design for many of

the proposed lots. The mat foundations should be structurally reinforced to distribute the building loads over the entire area of the mat foundations. Mat foundations are typically lightly loaded bearing members and are not capable of producing sufficient dead load to resist swell potential of soils supporting the foundation, therefore a site specific geotechnical engineering study should be done to establish appropriate design criteria.

The perimeter edges of the mat exposed to exterior temperature changes should be designed and constructed sufficiently deep below the adjacent grade to extend below the maximum depth of frost penetration for the area. Refer to the local building code for details.

7.0 INTERIOR FLOOR SLAB DISCUSSION

The natural soils that will support interior floor slabs are stable at their natural moisture content. However, the owner should realize that when wetted, the site soils may experience volume changes.

Engineering design dealing with swelling soils is an art which is still developing. The lot owners are cautioned that the soils on this site may have swelling potential and concrete slab-on-grade floors and other lightly loaded members may experience movement when the supporting soils become wetted. We suggest lot owners consider floors suspended from the foundation systems as structural floors or a similar design that will not be influenced by subgrade volume changes. If the owner is willing to accept the risk of possible damage from swelling soils supporting concrete slab-on-grade floors, recommendations to help reduce the damage from swelling soils should be followed. The recommendations for concrete slab-on-grade on swelling soils are based on generally accepted design and construction procedures for construction on soils that tend to experience volume changes when wetted and are intended to help reduce the damage caused by swelling soils. Lambert and Associates does not intend that the owner, or the owner's consultants should interpret recommendations as a solution to the problems of swelling soils, but as measures to reduce the influence of swelling soils. A site and structure specific geotechnical engineering study should be performed to provide suggestions and recommendations for concrete slab-on-grade floors to help reduce the influence of swelling soils.

8.0 COMPACTED STRUCTURAL FILL

We anticipate that placement of compacted structural fill will be included in the site development. Compacted structural fill is typically a material which is constructed for direct support of structures or structural components. Compacted structural fill placed on the natural hillside to develop pads and areas for construction will require site specific considerations for earthwork recommendations. These are not presented here.

There are several material characteristics which should be examined before choosing a material for potential use as compacted structural fill. These characteristics include: the size of the larger particles, the engineering characteristics of the fine grained portion of material matrix, the moisture content that the material will need to be for compaction with respect to the existing initial moisture content, the organic content of the material, and the items that influence the cost to use the material.

We typically suggest that the particle size of the compacted structural fill material be less than about two (2) to three (3) inches. The reason for this maximum size is that larger sizes may have too great an influence on the compaction characteristics of the material and may also impose point loads on the footings for floor slabs that are in contact with the material. Frequently pit-run material or crushed aggregate material is used for structural fill material. Pit-run material may be satisfactory, however crushed aggregate material with angular grains is preferable. Angular particles tend to interlock with each other better than rounded particles.

The fine grained portion of the fill material will have a significant influence on the performance of the fill. Material which has a fine grained matrix composed of silt and/or clay which exhibits expansive characteristics should be avoided for use as structural fill. The moisture content of the material should be monitored during construction and maintained near optimum moisture content for compaction of the material.

Soil with an appreciable organic content may not perform adequately for use as structural fill material due to the compressibility of the material and ultimately due to the decay of the organic portion of the material. Compacted fill should be a non-expansive material with the maximum aggregate size less than about three (3) inches and less than about twenty-five (25) percent coarser than three-quarter (3/4) inch size.

The suitability of the natural on-site soils for use as compacted structural fill should be determined on a structure and site specific basis.

All areas to receive compacted structural fill should be properly prepared prior to fill placement. The preparation should include removal of all organic or deleterious material and the area to receive fill should be compacted after the organic and deleterious material has been removed. Any areas of soft, yielding, or low density soil, evidenced during the excavation compaction operation should be removed. Fill should be moisture conditioned, placed in thin lifts and compacted.

We recommend that the geotechnical engineer or his representative be present during the excavation compaction and fill placement operations to observe and test the material.

9.0 LATERAL EARTH PRESSURES

Laterally loaded walls supporting soil, such as basement walls, will act as retaining walls and should be designed as such. Walls that are designed to deflect and mobilize the internal soil strength should be designed for active earth pressures. Walls that are restrained so that they are not able to deflect to mobilize internal soil strength should be designed for at-rest earth pressures. The values for the lateral earth pressures will depend on the type of soil retained by the wall, backfill configuration and construction technique. If the retained backfill is not level the lateral earth pressures will be greater than for level backfill. Passive lateral earth pressure values will depend on the retaining wall footing geometry and the material in the passive lateral earth pressure zone of influence.

Walls retaining soil should be designed and constructed so that hydrostatic pressure will not accumulate or will not affect the integrity of the walls. Drainage plans on each site should include a subdrain behind the wall at the bottom of the backfill to provide positive drainage. Exterior retaining walls should be provided with perimeter drain or weep holes to help provide an outlet for collected water behind the wall. The ground surface adjacent to the wall should be sloped to permit rapid drainage of rain, snow melt and irrigation water away from the wall backfill. Sprinkler systems should not be installed directly adjacent to retaining or basement walls. A subsurface drain system will need to be installed as part of the site development on sites with retaining walls. The site specific

geotechnical engineering study should address lateral earth pressures and subsurface drain system requirements.

10.0 BACKFILL

Backfill areas and utility trench backfill should be constructed such that the backfill will not settle after completion of construction, and that the backfill is relatively impervious for the upper few feet. The backfill material should be free of trash and other deleterious material. It should be moisture conditioned and compacted. Only enough water should be added to the backfill material to allow proper compaction. Do not pond, puddle, float or jet backfill soils.

Improperly placed backfill material will allow water migration more easily than properly recompacted fill. Improperly compacted fill is likely to settle, creating a low surface area which further enhances water accumulation and subsequent migration to the foundation soils.

Improperly placed backfill will allow water to migrate along the utility trench or backfill areas to gain access to the subgrade support soils with subsequent mobilization of the swell or settlement mechanism resulting in movement of the supported structure. Moisture migration could also result in the inconvenience of free water in the crawl space.

Backfill placement techniques should not jeopardize the integrity of existing structural members. We recommend recently constructed concrete structural members be appropriately cured prior to adjacent backfilling.

11.0 SURFACE DRAINAGE

The foundation soil materials in the vicinity of structures or structural components or flatwork should be prevented from becoming wetted after construction. Post construction wetting of the soil support soil materials can initiate swell potential or settlement potential as well as decrease the bearing capacity of the support soil materials. Protecting the structural members from wetting can be aided by providing positive and rapid drainage of surface water away from the structure.

The project civil engineering design should accommodate surface drainage considerations for the project. Individual sites may have specific drainage considerations based on the proposed construction and structure elevations. We typically suggest a positive drainage away from foundation and flatwork components to decrease surface water access to the foundation soils.

The erosion potential and surface drainage considerations should be addressed on a site specific basis.

12.0 LANDSCAPE IRRIGATION

An irrigation system should not be installed next to foundations, concrete flatwork or paved areas. If an irrigation system is installed, the system should be placed so that the irrigation water does not fall or flow near foundations, flatwork or pavements. The amount of irrigation water should be controlled.

We recommend that wherever possible xeriscaping concepts be used. Generally, the xeriscape includes planning and design concepts which will reduce irrigation water. The reason we suggest xeriscape concepts for landscaping is because the reduced landscape water will decrease the potential for water to influence the slope stability or the long term performance of the structure foundations and flatwork. Many publications are available which discuss xeriscape. Colorado State University Cooperative Extension has several useful publications and most landscape architects are familiar with the subject.

13.0 SOIL CORROSIVITY TO CONCRETE

Chemical tests to determine the sulfate content and corrosive potential to concrete of the site soils were not within the scope of this report. Our experience in the area has been that the soil materials in the vicinity of the site have a low to moderate corrosive potential to concrete. If an assessment of the corrosive potential of the soils is needed, it can be determined on a site specific basis.

14.0 RADON CONSIDERATIONS

Our experience indicates that many of the soils in western Colorado produce small quantities of radon gas. Radon gas may tend to collect in closed poorly ventilated structures. Radon considerations are presented in Appendix D.

15.0 PRE DESIGN AND CONSTRUCTION CONSIDERATIONS

The project geotechnical engineer should be consulted during planning, design and construction phases of the project to provide continuing services.

This feasibility level study is based on limited sampling; therefore, it is necessary to assume that the subsurface conditions do not vary greatly from those encountered in the field study. Our experience has shown that significant variations are likely to exist and can become apparent only during additional on site excavation. For this reason, and because of our familiarity with the project, Lambert and Associates should be retained to provide on going consultation throughout the planning design and construction phases of the project to be available to comment on and provide recommendations with respect to the geotechnical engineering aspects of the project and to be available in the event any unusual or unexpected conditions are encountered. The cost of additional geotechnical engineering consultation and material testing during construction or any additional engineering services are not included in the fee for this report. We recommend that your budget include provision for additional engineering services.

We recommend that the observation and material testing services during construction be retained by the owner or the owner's engineer or architect, not the contractor, to maintain third party credibility. We are experienced and available to provide material testing services. We have included a copy of a

report prepared by Van Gilder Insurance which discusses testing services during construction. It is our opinion that the owner, architect and engineer be familiar with the information. If you have any questions regarding this concept please contact us.

We suggest that your construction plans and schedule include provisions for geotechnical engineering observations and material testing during construction and your budget reflect these provisions.

15.1 Structural Fill Quality

It is our understanding that the proposed development may include compacted structural fill. This section of our report is to provide some suggestions for you and your design team with respect to structural fill materials. The quality of compacted structural fill will depend on the type of material used as structural fill, fill lift thickness, fill moisture condition and compactive effort used during construction of the structural fill. Engineering observation and testing of structural fill is essential as an aid to safeguard the quality and performance of the structural fill.

Testing of the structural fill normally includes tests to determine the grain size distribution, swell potential and moisture-density relationship of the fill material to verify the material suitability for use as structural fill. As the material is placed the in place moisture content and dry density are tested to indicate the relative compaction of the placed structural fill. We recommend that your budget include provisions for observation and testing of structural fill during construction.

Testing of the compacted fill material should include tests of the moisture content and density of the fill material placed and compacted prior to placement of additional fill material. We suggest that a reasonable number of density tests of the fill material can best be determined on a site, material and construction basis although as a guideline we suggest one test per about each 300 to 500 square feet of each lift of fill material. Utility trench backfill may need to be tested about every 100 linear feet of lift of backfill.

15.2 Concrete Quality

It is our understanding current plans include reinforced structural concrete for foundations and walls and may include concrete slabs on grade and pavement. This section of our report is to provide suggestions to you and your design team with respect to concrete quality. To insure concrete members perform as intended,

the structural engineer should be consulted and should address factors such as design loadings, anticipated movement and deformations.

The quality of concrete is influenced by proportioning of the concrete mix, placement, consolidation and curing. Desirable qualities of concrete include compressive strength, water tightness and resistance to weathering. Engineering observations and testing of concrete during construction is essential as an aid to safeguard the quality of the completed concrete.

Testing of the concrete is normally performed to determine compressive strength, entrained air content, slump and temperature. We recommend that your budget include provisions for testing of concrete during construction. We suggest that a reasonable frequency of concrete tests can best be determined on a site, materials and construction specific basis although as a guideline American Concrete Institute, ACI, suggests one test per about each fifty (50) cubic yards or portion thereof per day of concrete material placed.

16.0 LIMITATIONS

This and feasibility level geotechnical engineering study is based on limited sampling, therefore it is necessary to assume that the subsurface conditions do not vary greatly from those encountered in the test borings. Our experience has shown that significant variations are likely to exist and can become apparent only during additional on-site excavation. For this reason, and because of our

familiarity with the project, Lambert an Associates should be retained to perform a geotechnical engineering study for each proposed building site.

It is the owner's and the owner's representatives responsibility to read this report and become familiar with the recommendations and suggestions presented. We should be contacted if any questions arise concerning the geotechnical engineering aspects of this project as a result of the information presented in this report.

The comments, suggestions and recommendations outlined above are based on our understanding of the currently proposed construction. We are available to discuss the details of our recommendations with you and revise them where necessary. This geotechnical engineering report is based on the proposed site development and scope of services as discussed with Mr. Gary Derck and Mr. Jim Hards, Purgatory-Durango Mountain Resort, on the type of construction planned, existing site conditions at the time of the field study, and on our findings. Should the planned, proposed use of the site be altered, Lambert and Associates must be contacted, since any such changes may make our suggestions and recommendations given inappropriate. This report should be used ONLY for the planned development for which this report was tailored and prepared, and ONLY to meet information needs of the owner and the owner's representatives.

We represent that our services were performed within the limits prescribed by you and with the usual thoroughness and competence of the current accepted practice of the geotechnical engineering profession in the area. No warranty or representation either expressed or implied is included or intended in this report or our contract. We are available to discuss our findings with you. If you have any questions please contact us. The supporting data for this report is included in the accompanying figures and appendices.

This report is a product of Lambert and Associates. Excerpts from this report used in other documents may not convey the intent or proper concepts when taken out of context or they may be misinterpreted or used incorrectly. Reproduction, in part or whole, of this document without prior written consent of Lambert and Associates is prohibited.

We have enclosed a copy of a brief discussion about geotechnical reports published by Association of Soil and Foundation Engineers for your reference.

Please call when further consultation or observations and tests are required.

If you have any questions concerning this report or if we may be of further assistance, please contact us.

Respectfully submitted;
LAMBERT AND ASSOCIATES

David L. Trautner, P.E., CPG
Durango Office Manager

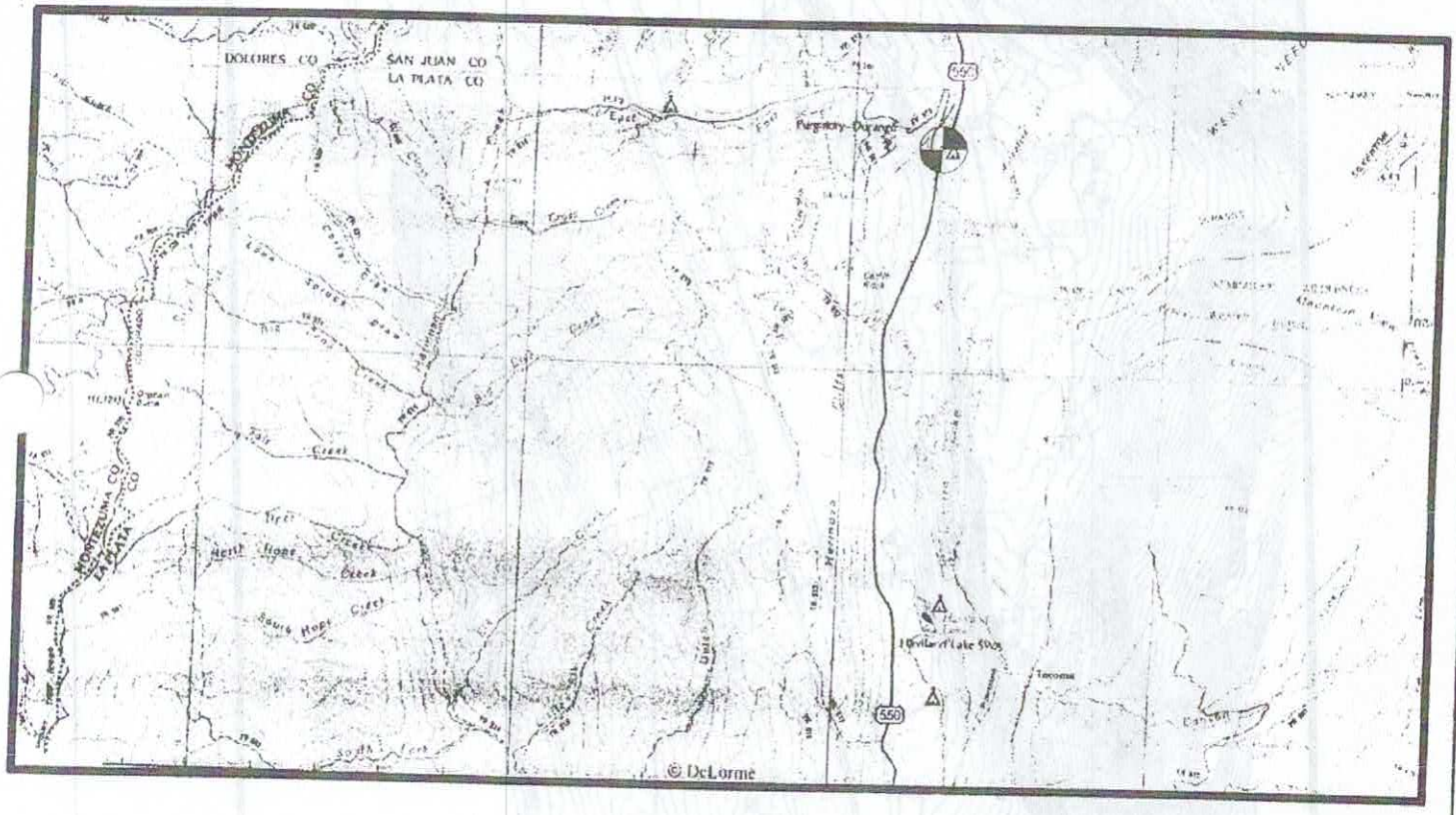
Reviewed by,

Dennis D. Lambert, P.E.
Principal Geotechnical Engineer

DLT/tg

PROJECT VICINITY MAP

No Scale



This symbol indicates the approximate project location.

This map was reproduced from the Colorado Atlas and Gazetteer, Copywright DeLorme Mapping.
Reproduced with permission.
This map is intended to present geotechnical data only.

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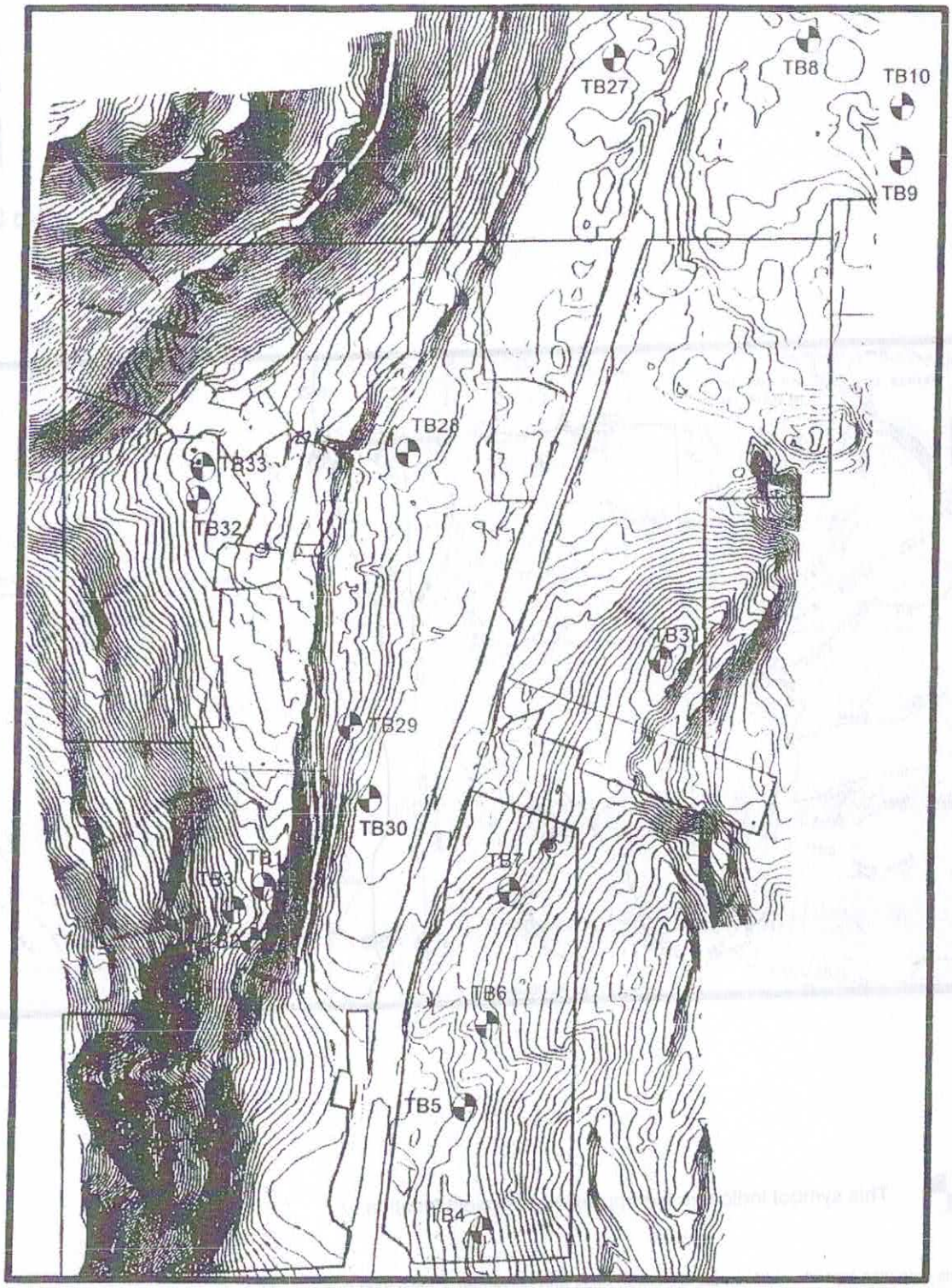
Project No. : D00147GE

Figure: 1

Test Boring Location Map



N

No Scale

This symbol indicates the approximate test boring location.

This map is intended to present geotechnical data only.

Lambert and Associates

Project No.: D00147GE

Figure: 2A

Test Boring Location Map

This symbol indicates the approximate test boring location.
This map is intended to present geotechnical data only.

Lambert and Associates

Project No.: D00147GE	
Figure: 2b	

APPENDIX A

The field study was performed on from June 29, through August 3, 2000. The field study consisted of logging and sampling the soils encountered in thirty-three (33) test borings. The approximate locations of the test borings are shown on Figure 2. The log of the soils encountered in the test borings are presented on Figures A2 through A35.

The test borings were logged by Lambert and Associates and samples of significant soil types were obtained. The samples were obtained from the test borings using a Modified California Barrel sampler and bulk disturbed samples were obtained. Penetration blow counts were determined using a 140 pound hammer free falling 30 inches. The blow counts are presented on the logs of the test borings such as 15/6 where 15 blows with the hammer were required to drive the sampler 6 inches.

The engineering field description and major soil classification are based on our interpretation of the materials encountered and are prepared according to the Unified Soil Classification System, ASTM D2488. The description and classification which appear on the test boring log is intended to be that which most accurately describes a given interval of the test boring (frequently an interval of several feet). Occasionally discrepancies occur in the Unified Soil Classification System nomenclature between an interval of the soil log and a particular sample in the interval. For example, an interval on the test boring log may be identified as a silty sand (SM) while one sample taken within the interval may have individually been identified as a sandy silt (ML). This discrepancy is frequently allowed to remain to emphasize the occurrence of local textural variations in the interval.

The stratification lines presented on the logs are intended to present our interpretation of the subsurface conditions encountered in the test borings. The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

LOG OF TEST BORING

Date Advanced 6/29/00 Field Engineer D. Trautner Test Boring Number One (1)

Diameter 4" Solid Total Depth One (1) foot Elevation N/A

Location Please See Figure Two (2)

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
				Silt, sandy, soft, moist, grey, organics, (ML)	
				Bottom of test boring at one (1) foot Auger refusal on limestone formation	
	5				
	10				
	15				
	20				
	25				

Project Name Purgatory Resort Project Number D00147GE Figure A2

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LOG OF TEST BORING

Date Advanced 6/29/00 Field Engineer D. Trautner Test Boring Number Two (2)

Diameter 4" Solid Total Depth Two and one half (2.5) feet Elevation N/A

Location Please See Figure Two (2)

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
				Sand, silty, gravely, soft, dry, grey, (SM)	
				Bottom of test boring at two and one half (2.5) feet Auger refusal on limestone	
	5				
	10				
	15				
	20				
	25				

Project Name Purgatory Resort Project Number D00147GE Figure A3

LOG OF TEST BORING

Date Advanced 6/29/00 Field Engineer D. Trautner Test Boring Number Three (3)

Diameter 4" Solid Total Depth Twelve and one half (12.5) feet Elevation N/A

Location Please See Figure Two (2)

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
				Silt, sandy, soft, moist, brown, (ML)	
	5	C	17/6 11/6	Sand, silty, gravely, dense, moist, brown, (SM)	
	10			Clay and gravels, sandy, stiff, moist, brown, (CL-GC)	
	15			Bottom of test boring at twelve and one half (12.5) feet Auger refusal on sandstone	
	20				
	25				

Project Name Purgatory Resort Project Number D00147GE Figure A4

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LOG OF TEST BORING

Date Advanced 6/30/00 Field Engineer D. Trautner Test Boring Number Four (4)

Diameter 4" Solid Total Depth Three (3) feet Elevation N/A

Location Please See Figure Two (2)

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
		B A G		Silt, sand, cobbles, dense, moist, brown, (SM-GM)	
				Gravel, sandy, dense, moist, brown, (GM)	
				Bottom of test boring at three (3) feet Auger refusal on limestone	
	5				
	10				
	15				
	20				
	25				

oject Name Purgatory Resort Project Number D00147GE Figure A5

LOG OF TEST BORING

Date Advanced 6/30/00 Field Engineer D. Trautner Test Boring Number Five (5)

Diameter 4" Solid Total Depth Three and one half (3) feet Elevation N/A

Location Please See Figure Two (2)

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
				Gravel, silty, sandy, dense, moist, brown, (GM)	
	5			Bottom of test boring at three and one half (3.5) feet Auger refusal on limestone	
	10				
	15				
	20				
	25				

Project Name Purgatory Resort Project Number D00147GE Figure A6

LOG OF TEST BORING

Date Advanced 6/30/00 Field Engineer D. Trautner Test Boring Number Six (6)

Diameter 4" Solid Total Depth One and one half (1.5) feet Elevation N/A

Location Please See Figure Two (2)

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
				Gravel, sand, clayey, dense, moist, brown, (GM)	
				Bottom of test boring at one and one half (1.5) feet Auger refusal on limestone	
	5				
	10				
	15				
	20				
	25				

oject Name Purgatory Resort Project Number D00147GE Figure A7

LOG OF TEST BORING

Date Advanced 6/30/00 Field Engineer D. Trautner Test Boring Number Seven (7)

iameter 4" Solid Total Depth Three and one half (3) feet Elevation N/A

ocation Please See Figure Two (2)

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
		B A G		Silt, gravel, sandy, (ML-GM)	
	5			Bottom of test boring at three and one half (3.5) feet Auger refusal on limestone	
	10				
	15				
	20				
	25				

oject Name Purgatory Resort Project Number D00147GE Figure A8

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LOG OF TEST BORING

Date Advanced 7/5/00 Field Engineer D. Trautner Test Boring Number Eight (8)

Diameter 4" Solid Total Depth 5 1/2 feet Elevation N/A

Location Please See Figure Two (2)

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
		B A G		Silt, sand, few gravels, soft, slightly moist, brown (ML) organics	
				Weathered formational material, fractured limestone, hard, gray	
	5			Bottom of test boring at five and one-half feet Auger refusal on in bottom of test hole.	
	10				
	15				
	20				
	25				

Project Name Purgatory Resort Project Number D00147GE Figure A9

LOG OF TEST BORING

Date Advanced 7/5/00 Field Engineer D. Trautner Test Boring Number Nine (9)

ameter 4" Solid Total Depth 4 feet Elevation N/A

Location Please See Figure Two (2)

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
				Formational material, limestone, hard, gray.	
	5			Auger refusal on in bottom of test hole at four (4) feet.	
	10				
	15				
	20				
	25				

Project Name Purgatory Resort Project Number D00147GE Figure A10

LOG OF TEST BORING

Date Advanced 7/5/00 Field Engineer D. Trautner Test Boring Number Ten (10)

ameter 4" Solid Total Depth 4 feet Elevation N/A

Location Please See Figure Two (2)

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
		B A G		Silt, cobbles, limestone pieces, soft, slightly moist, brown. (ML)	
				Formational material, limestone, hard	
	5			Auger refusal in bottom of test boring at four (4) feet on formational material, limestone, hard, gray	
	10				
	15				
	20				
	25				

Project Name Purgatory Resort Project Number D00147GE Figure A11

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LOG OF TEST BORING

Date Advanced 7/5/00 Field Engineer D. Trautner Test Boring Number Eleven (11)

Diameter 4" Solid Total Depth 3 1/2 feet Elevation N/A

Location Please See Figure Two (2)

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
				Silt, sandy, gravels, soft, dry brown. (ML), organic	
	5			Auger refusal in bottom of test boring at three and one-half feet on limestone.	
	10				
	15				
	20				
	25				

Project Name Purgatory Resort Project Number D00147GE Figure A12

LOG OF TEST BORING

Date Advanced 7/5/00 Field Engineer D. Trautner Test Boring Number Twelve (12)

Diameter 4" Solid Total Depth 4 feet Elevation N/A

Location Please See Figure Two (2)

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
		B A G		Gravel, cobbles, silty, loose, dry, brown, (GM) organics	
				Formational material, limestone, hard, gray	
	5			Auger refusal in bottom of test boring at four (4) feet on limestone.	
	10				
	15				
	20				
	25				

Project Name Purgatory Resort Project Number D00147GE Figure A13

LOG OF TEST BORING

Date Advanced 7/5/00 Field Engineer D. Trautner Test Boring Number Thirteen (13)

Diameter 4" Solid Total Depth Twenty-three (23) feet Elevation N/A

Location Please See Figure Two (2)

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
		B A G		Silt, sand, medium dense, slightly moist, brown (ML-GM)	
				Limestone fragments	
				Sand and gravel, silty, cobbles, dense, moist, brown. (SM-GM)	
	5	B A G			
	10			Sand lense	
				Increase moisture with depth	
				Sand lense	
	15				
	20			Cobbles for two (2) - three (3) feet	
				Bottom of test boring at twenty-three (23) feet	
	25				

Project Name Purgatory Resort Project Number D00147GE Figure A14

LOG OF TEST BORING

Date Advanced 7/5/00 Field Engineer D. Trautner Test Boring Number Fourteen (14)

Diameter 4" Solid Total Depth Five (5) feet Elevation N/A

Location Please See Figure Two (2)

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
		B A G		Silt, sand, gravel, medium stiff, slightly moist, brown (ML)	
	5			Formational material, limestone, hard Auger refusal in bottom of tst boring at five (5) feet.	
	10				
	15				
	20				
	25				

Project Name Purgatory Resort Project Number D00147GE Figure A15

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LOG OF TEST BORING

Date Advanced 7/20/00 Field Engineer D. Trautner Test Boring Number Fifteen (15)

Diameter 4" Solid Total Depth Twenty and one-half feet Elevation N/A

Location Please See Figure Two (2)

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
		B A G		Silt, slightly sandy, soft, very moist, black. (ML) organics	
				Silt, sandy, scattered cobbles, soft, very moist, dark brown. (ML)	
		C	3/6 7/6		
	5			Silt and sand, few cobbles, very soft, wet, brown. (ML-SM)	
		B A G			
	10			Cobbles	
	15				
				Weathered formational material, fractured limestone, consolidated	
	20			Formational material, limestone, hard, gray to matted color, Molas Formation	
				Bottom of test boring at twenty and one-half (20 1/2) feet	
	25				

Project Name Purgatory Resort Project Number D00147GE Figure A16

LOG OF TEST BORING

Date Advanced 7/20/00 Field Engineer D. Trautner Test Boring Number Sixteen (16)

Diameter 4" Solid Total Depth Twelve and one-half feet Elevation N/A

Location Please See Figure Two (2)

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
		B A G		Gravel, silty, sandy, cobbles, medium dense, slightly moist,brown. (GM)	
	5	B A G		Increase in cobble content with depth	
	10			Cobbles, sandy, dense, dry, brown, (GM-GP)	
				Auger refusal in bottom of test boring at twelve and one-half (12 1/2) feet on loose boulder at formational material	
	15				
	20				
	25				

Project Name Purgatory Resort Project Number D00147GE Figure A17

LOG OF TEST BORING

Date Advanced 7/20/00 Field Engineer D. Trautner Test Boring Number Seventeen (17)

ameter 4" Solid Total Depth Twelve (12) feet Elevation N/A

Location Please See Figure Two (2)

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
		B A G		Gravel, silty, sandy, medium stiff, slightly moist, brown. (GM)	
	5	B A G		Formational material, sandstone, firm to hard	
	10			Bottom of test boring at twelve (12) feet	
	15				
	20				
	25				

Project Name Purgatory Resort Project Number D00147GE Figure A18

LOG OF TEST BORING

Date Advanced 7/20/00 Field Engineer D. Trautner Test Boring Number Eighteen (18)

'ameter 4" Solid Total Depth Ten (10) feet Elevation N/A

Location Please See Figure Two (2)

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
		B A G		Silt, sandy, gravels, soft, slightly moist, brown. (ML)	
	5			Weathered formational material, sandstone, fractured, firm to medium hard	
				Formational material, sandstoneor limestone, very hard	
	10			Bottom of test boring at ten (10) feet	
	15				
	20				
	25				

Project Name Purgatory Resort Project Number D00147GE Figure A19

LOG OF TEST BORING

Date Advanced 7/20/00 Field Engineer D. Trautner Test Boring Number Nineteen (19)

iameter 4" Solid Total Depth Five (5) feet Elevation N/A

Location Please See Figure Two (2)

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
				Silt, sandy, gravels, moist, brown. (ML) 12" of organics	
				Formational material, hard to very hard, gray-green, Hermosa Formation	
	5			Auger refusal in bottom of test boring at five (5) feet	
	10				
	15				
	20				
	25				

Project Name Purgatory Resort Project Number D00147GE Figure A20

LOG OF TEST BORING

Date Advanced 7/20/00 Field Engineer D. Trautner Test Boring Number Twenty (20)

Diameter 4" Solid Total Depth Fifteen (15) feet Elevation N/A

Location Please See Figure Two (2)

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
		B A G		Silt, sandy, few gravels, soft, slightly moist, brown. (ML) 12" of organics	
				Boulders, slightly silty, few gravels, soft, slightly moist tan. (GM)	
	5			Sand, slightly silty, few gravels, soft, medium moist, brown. (SM)	
	10			Formational material, sandstone, moist, very hard.	
	15			Auger refusal in bottom of test boring at fifteen (15) feet.	
	20				
	25				

Project Name Purgatory Resort Project Number D00147GE Figure A21

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LOG OF TEST BORING

Date Advanced 7/20/00 Field Engineer D. Trautner Test Boring Number Twenty-one (21)

Diameter 4" Solid Total Depth Fifteen (15) feet Elevation N/A

Location Please See Figure Two (2)

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
		B A G		Silt, sandy, few gravels, medium stiff, moist, brown, (ML)	
		C	9/12		
	5	B A G			
		C	10/0	Boulder	
	10	B A G			
	15			Bottom of test boring at fifteen (15) feet	
	20				
	25				

Project Name Purgatory Resort Project Number D00147GE Figure A22

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LOG OF TEST BORING

Date Advanced 7/20/00 Field Engineer D. Trautner Test Boring Number Twenty-two (22)

Diameter 4" Solid Total Depth Ten (10) feet Elevation N/A

Location Please See Figure Two (2)

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
		B A G		Silt, soft, moist, black, (OL)	
	5			Weathered formational material, sandstone, fractured, firm, tan, Hermosa group	
				Formational material, very hard, limestone or sandstone, grey-green	
	10			Bottom of test boring at ten (10) feet Auger refusal	
	15				
	20				
	25				

Project Name Purgatory Resort Project Number D00147GE Figure A23

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LOG OF TEST BORING

Date Advanced 7/20/00 Field Engineer D. Trautner Test Boring Number Twenty-three (23)

Diameter 4" Solid Total Depth Ten (10) feet Elevation N/A

Location Please See Figure Two (2)

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
				Silt, sand, very soft, moist to wet, black, (OL)	
	5			Sand, silty, soft, wet, brown	
				Scattered cobbles, weathered formation	
	10			Formational material, hard, sandstone, grey-green	
				Bottom of test boring at ten (10) feet	
	15				
	20				
	25				

Project Name Purgatory Resort Project Number D00147GE Figure A24

LOG OF TEST BORING (continued)

Date Advanced 7/20/00 Field Engineer J. Butler Test Boring Number Twenty-four (24)

Diameter 4" Solid Total Depth Thirty-six (36) feet Elevation N/A

Location Please See Figure Two (2)

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
	35			Formation, limestone, very hard Bottom of test boring at thrity-six (36) feet	
	40				
	45				
	50				
	55				

Project Name Purgatory Resort Project Number D00147GE Figure A25b

LOG OF TEST BORING

Date Advanced 7/20/00 Field Engineer D. Trautner Test Boring Number Twenty-four (24)

Diameter 4" Solid Total Depth Thirty-six (36) feet Elevation N/A

Location Please See Figure Two (2)

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
				Silt, organics, soft, moist, dark brown, (ML)	
				Silt, some sand, soft, moist, dark brown, (ML)	
	5			Silt and clay, few cobbles, soft, wet, brown, (ML-SM)	
	10				
	15				
	20			Silt, cobbles, very stiff, moist, brown, (ML)	
	25			Increase moisture with depth	

Project Name Purgatory Resort Project Number D00147GE Figure A25

LOG OF TEST BORING

Date Advanced /00 Field Engineer D. Trautner Test Boring Number Twenty-five (25)

Diameter 4" Solid Total Depth One and one half (1.5) feet Elevation N/A

Location Please See Figure Two (2)

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
				Silt, soft, moist, brown, (ML)	
				Formation, limestone, very hard	
				Bottom of test boring at one and one half (1.5) feet Auger refusal	
	5				
	10				
	15				
	20				
	25				

Project Name Purgatory Resort Project Number D00147GE Figure A26

LOG OF TEST BORING

Date Advanced 7/28/00 Field Engineer D. Trautner Test Boring Number Twenty-six (26)

Diameter 4" Solid Total Depth 4 feet Elevation N/A

Location Please See Figure Two (2)

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
		B A G		Silt, soft, moist, brown, (ML)	
	5			Auger refusal in bottom of test boring at four (4) feet on formational material, limestone, hard, gray	
	10				
	15				
	20				
	25				

Project Name Purgatory Resort Project Number D00147GE Figure A27

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CONSULTING GEOTECHNICAL ENGINEERS AND MATERIAL TESTING

LOG OF TEST BORING

Date Advanced 8/2/00 Field Engineer D. Trautner Test Boring Number Twenty-seven (27)

Diameter 4" Solid Total Depth Nineteen (19) feet Elevation N/A

Location Please See Figure Two (2)

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
		B A G		Silt, soft, moist, brown, (ML)	
	5	B A G			
	10				
	15			Silt, clayey, few gravels, soft, wet	
	20			Bottom of test boring at nineteen (19) feet	
	25				

Project Name Purgatory Resort Project Number D00147GE Figure A28

LOG OF TEST BORING

Date Advanced 8/3/00 Field Engineer J. Butler Test Boring Number Twenty-eight (28)

Diameter 4" Solid Total Depth Nineteen and one half (19.5) feet Elevation N/A

Location Please See Figure Two (2)

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
				One (1) foot man placed road base	
		B A G		Cobbles, silty, dense, moist, brown, (GM)	
	5				
		B A G		Silt, organics, soft, very moist, brown, (ML)	
	10	C	6/12		
				Silt and sand, cobbles, stiff, wet, brown, (ML-SM)	
	15				
				Formation, very hard, moist	
	20			Bottom of test boring at nineteen and one half (19.5)	
	25				

Project Name Purgatory Resort Project Number D00147GE Figure A29

LOG OF TEST BORING

Date Advanced 8/3/00 Field Engineer J. Butler Test Boring Number Twenty-nine (29)

Diameter 4" Solid Total Depth Nine and one half (9.5) feet Elevation N/A

Location Please See Figure Two (2)

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
				Silt, organics, soft, moist, brown, (ML)	
		B A G		Cobbles, silty, dense, moist, brown, (GM)	
	5	B A G			
				Formation, limestone, very hard	
	10			Bottom of test boring at nine and one half (9.5) feet Auger refusal	
	15				
	20				
	25				

Project Name Purgatory Resort Project Number D00147GE Figure A30

LOG OF TEST BORING

Date Advanced 8/3/00 Field Engineer J. Butler Test Boring Number Thirty (30)

Diameter 4" Solid Total Depth Fifteen and one-half feet Elevation N/A

Location Please See Figure Two (2)

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
				Cobbles, silty, slightly dense, moist, brown. (GM) organics	
		B A G		Cobbles, silty, dense, moist, brown. (GM)	
	5	C	16/6 43/6	Increase in cobbles with depth	
	10	B A G			
	15			Auger refusal in test boring at fifteen and one-half (15 1/2) feet in Formational Material	
	20				
	25				

Project Name Purgatory Resort Project Number D00147GE Figure A31

LOG OF TEST BORING

Date Advanced 8/3/00 Field Engineer J. Butler Test Boring Number Thirty-one (31)

Diameter Hand Excavated Total Depth Surface Elevation N/A

Location Please See Figure Two (2)

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
				Formational material, hard, gray limestone at ground surface.	
	5				
	10				
	15				
	20				
	25				

Project Name Purgatory Resort Project Number D00147GE Figure A32

LOG OF TEST BORING

Date Advanced 8/3/00 Field Engineer J. Butler Test Boring Number Thirty-two (32)

Diameter 4" solid Total Depth Seven (7) feet Elevation N/A

Location Please See Figure Two (2)

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
		B A G		Silt, sandy, soft, moist, brown. (ML)	
	5	C	10/6 25/6	Gravel, and cobbles, silty, dense, moist, brown. (GM)	
	10			Auger refusal in test boring at seven (7) feet in Formational Material, very hard	
	15				
	20				
	25				

Project Name Purgatory Resort Project Number D00147GE Figure A33

Lambert and Associates

CONSULTING GEOTECHNICAL ENGINEERS AND MATERIAL TESTING

LOG OF TEST BORING

Date Advanced 8/3/00 Field Engineer J. Butler Test Boring Number Thirty-three (33)

Diameter 4" solid Total Depth Eight (8) feet Elevation N/A

Location Please See Figure Two (2)

Symbol	Depth	Sample Type	Sample N	Soil Description	Laboratory Test Results
		B A G		Silt, sandy, soft, moist, brown. (ML) organics	
				Silt, slightly sandy, few cobbles, soft, moist, brown. (ML)	
	5	C	7/12		
		B A G			
				Auger refusal in test boring at eight (8) feet in Formational Sandstone, very hard	
	10				
	15				
	20				
	25				

Project Name Purgatory Resort Project Number D00147GE Figure A34

APPENDIX B

The laboratory study consisted of performing:

. Moisture content and dry density tests,
. Swell-consolidation tests, and,
. Direct Shear Strength tests.

It should be noted that samples obtained using a drive type sleeve sampler may experience some disturbance during the sampling operations. The test results obtained using these samples are used only as indicators of the in situ soil characteristics.

TESTING

Moisture Content and Dry Density

Moisture content and dry density were determined for each sample tested of the samples obtained. The moisture content was determined according to ASTM Test Method D2216 by obtaining the moisture sample from the drive sleeve. The dry density of the sample was determined by using the wet weight of the entire sample tested.

Swell Tests

Loaded swell tests were performed on drive samples obtained during the field study. These tests are performed in general accordance with ASTM Test Method D2435 to the extent that the same equipment and sample dimensions used for consolidation testing are used for the determination of expansion. A sample is subjected to static surcharge, water is introduced to produce saturation, and volume change is measured as in ASTM Test Method D2435. Results are reported as percent change in sample height.

Consolidation Tests

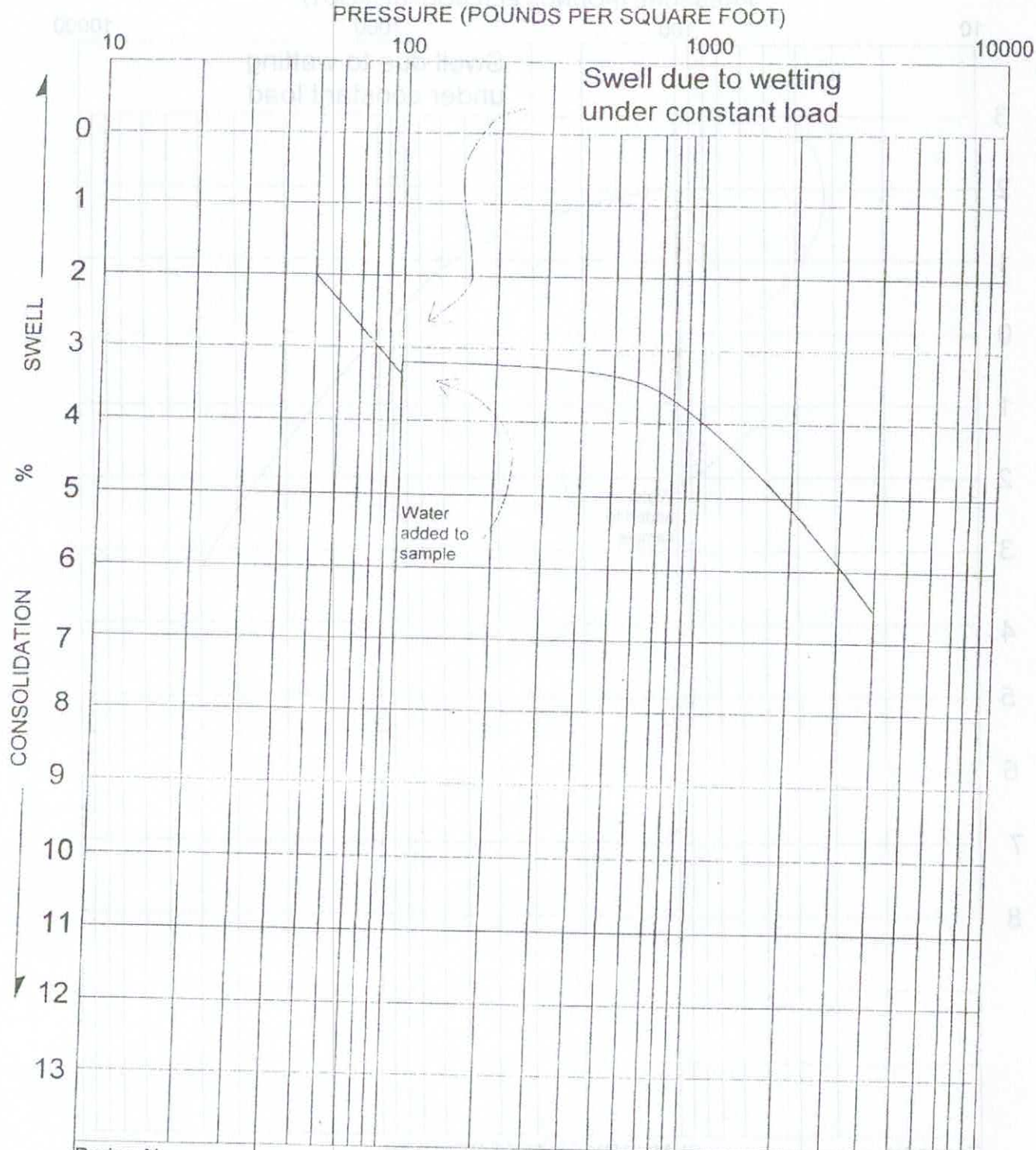
One dimensional consolidation properties of drive samples were evaluated according to the provisions of ASTM Test Method D2435. Water was added in all cases during the test. Exclusive of special readings during consolidation rate tests, readings during an increment of load were taken regularly until the change in sample height was less than 0.001 inch over a two hour period. The results of the swell-consolidation load test are summarized on Figures B1 through B10, swell-consolidation tests.

It should be noted that the graphic presentation of consolidation data is a presentation of volume change with change in axial load. As a result, both expansion and consolidation can be illustrated.

Direct Shear Strength Tests

Direct shear strength properties of sleeve samples were evaluated in general accordance with testing procedures defined by ASTM Test Method D3080. The direct shear strength test was performed on a sample obtained from test borings. The test results are below:

Test Boring Number	Depth	Internal Angle of Friction (degrees)	Cohesion (pounds)
3	3 feet	17	170
174	4.5 feet	24	153
21	4-15 feet	19	203



Boring No. Three (3)	SUMMARY OF TEST RESULTS				
Depth 0'-3' feet	Moisture Content (%)	Dry Density (P.C.F.)	Height (in.)	Diameter (in.)	Swell Pressure (P.S.F.)
Initial	12.3	94.4	1.000	1.94	700
Final	26.0	98.1	0.934	1.94	
Soil Description	Silt and sand				

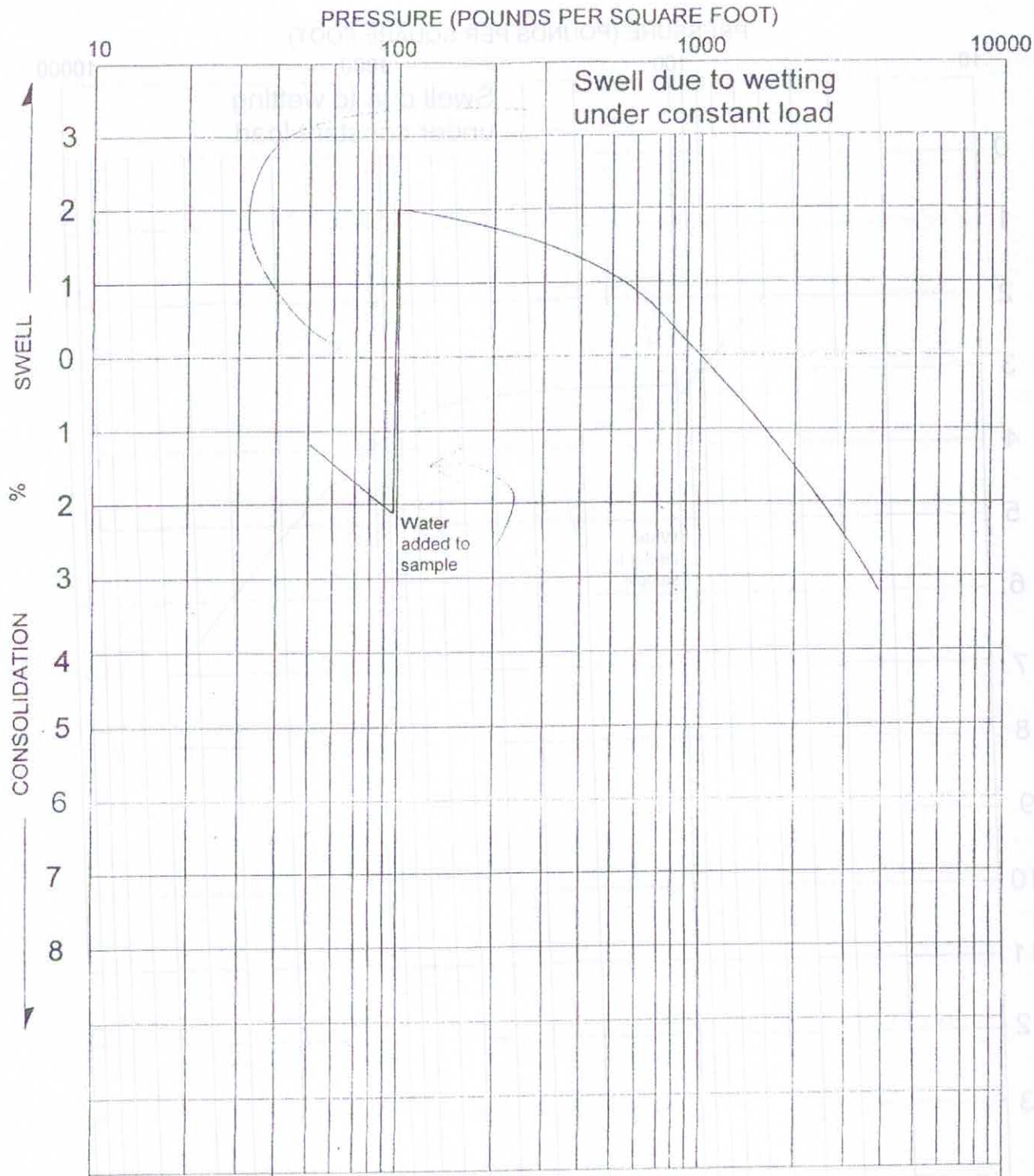
SWELL - CONSOLIDATION TEST

Lambert and Associates

Project No.: D00147GE

Date: 6/29/00

Figure: B1



Boring No. Seven (7)	SUMMARY OF TEST RESULTS				
Depth 0'-3' feet	Moisture Content (%)	Dry Density (P.C.F.)	Height (in.)	Diameter (in.)	Swell Pressure (P.S.F.)
Initial	8.7	101.7	1.000	1.94	3100
Final	25.0	104.0	0.968	1.94	
Soil Description	Silt with sand				

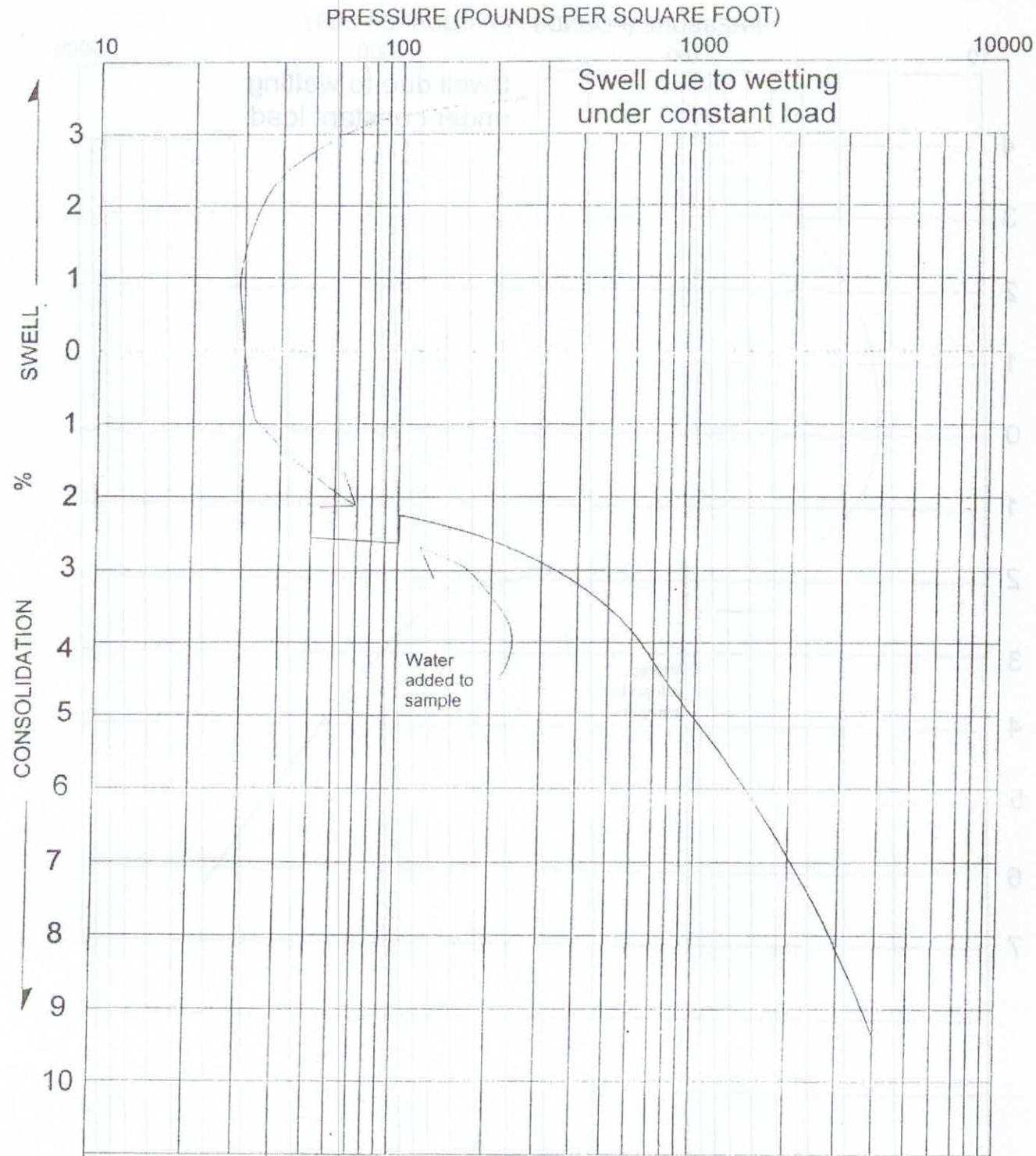
SWELL - CONSOLIDATION TEST

Lambert and Associates

Project No.: D00147GE

Date: 7/3/00

Figure: B2



Boring No. Eight (8)	SUMMARY OF TEST RESULTS				
Depth 0'-3' feet	Moisture Content (%)	Dry Density (P.C.F.)	Height (in.)	Diameter (in.)	Swell Pressure (P.S.F.)
Initial	4.0	103.4	1.000	1.94	500
Final	17.0	115.4	0.906	1.94	
Soil Description	Silt with sand				

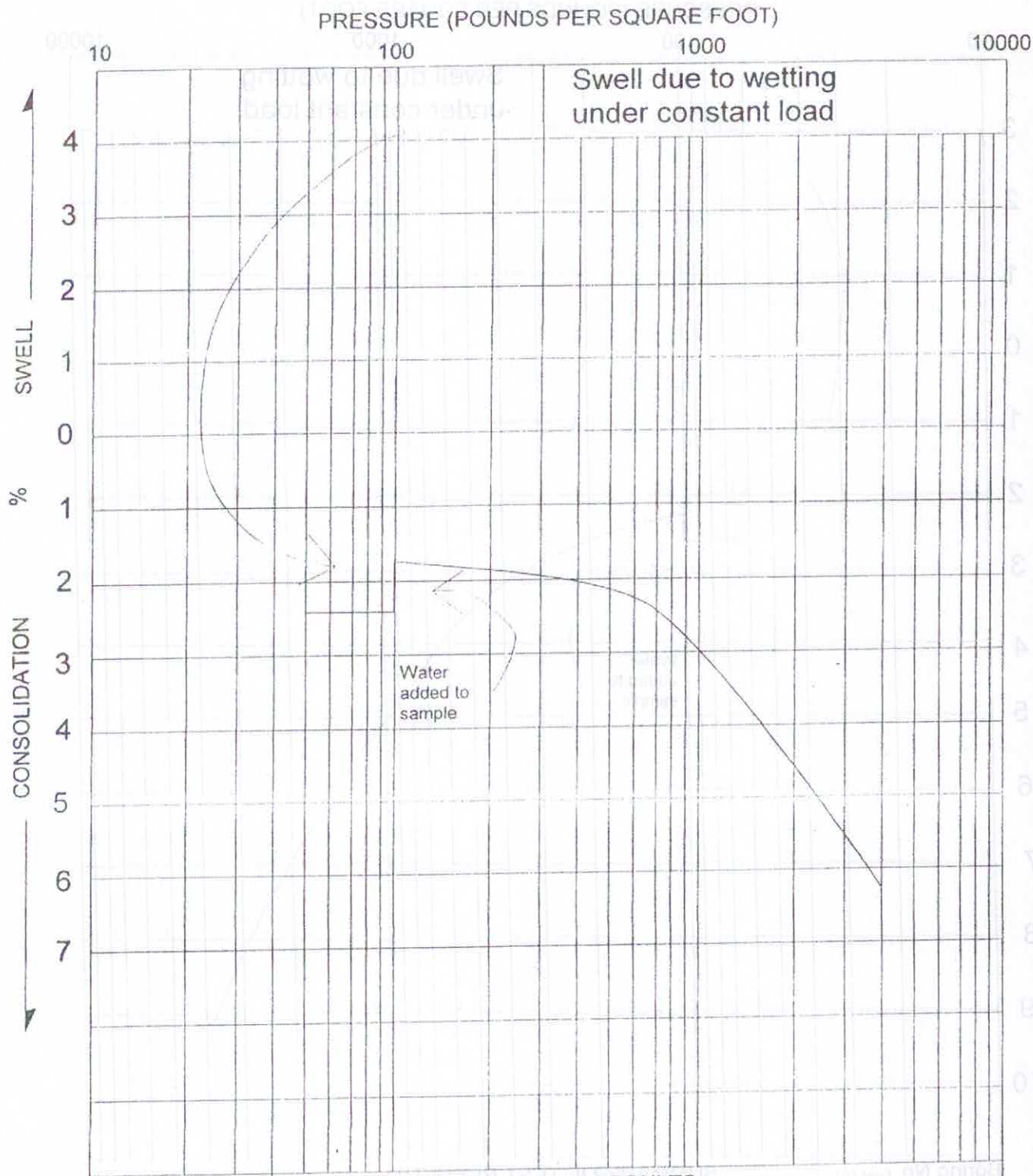
SWELL - CONSOLIDATION TEST

Lambert and Associates

Project No.: D00147GE

Date: 7/5/00

Figure: B3



Boring No. Twelve (12)	SUMMARY OF TEST RESULTS				
Depth 0'-2.5' feet	Moisture Content (%)	Dry Density (P.C.F.)	Height (in.)	Diameter (in.)	Swell Pressure (P.S.F.)
Initial	3.4	102.7	1.000	1.94	900
Final	20.3	110.5	0.938	1.94	
Soil Description	Silt, sand				

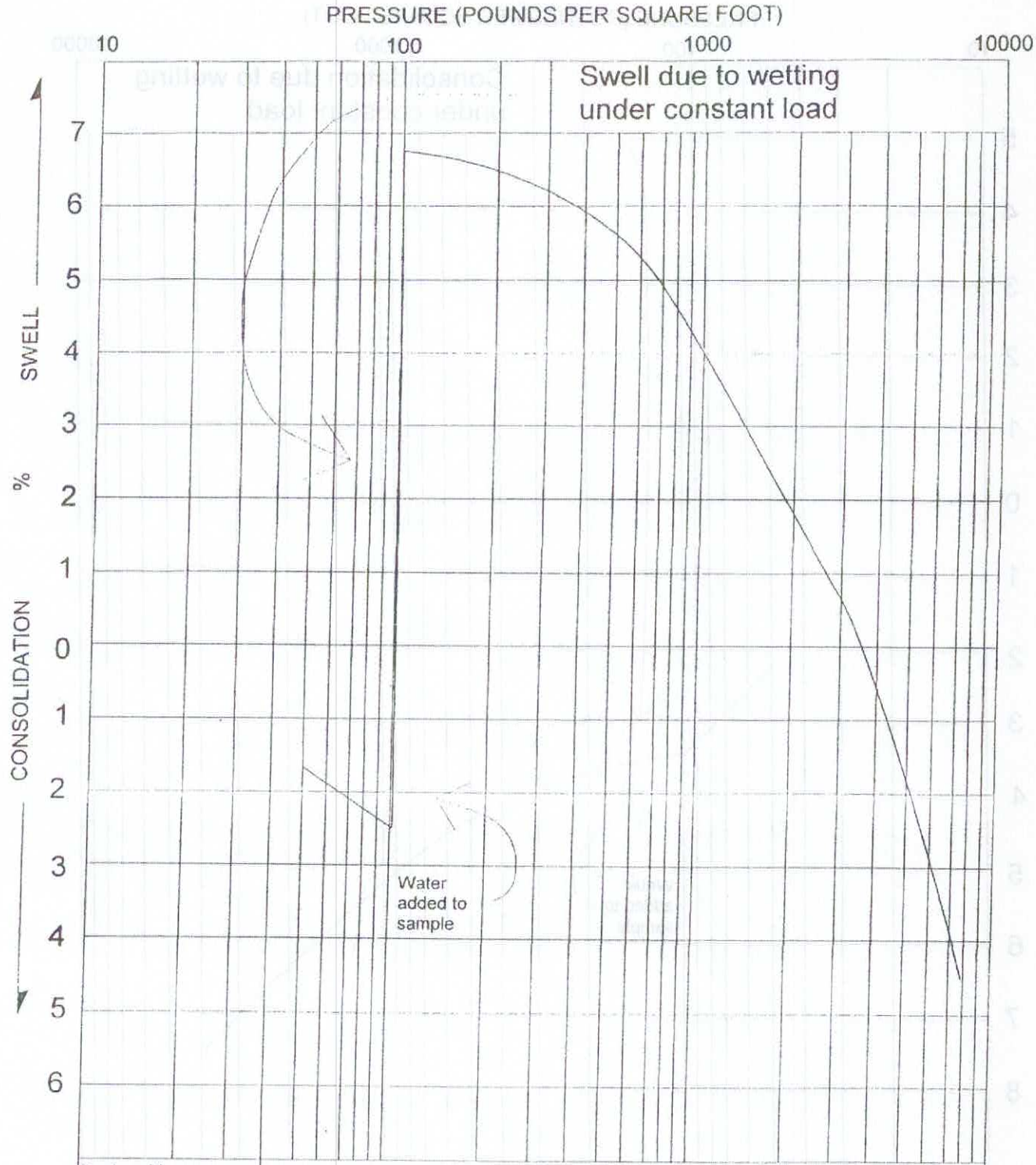
SWELL - CONSOLIDATION TEST

Lambert and Associates

Project No.: D00147GE

Date: 7/5/00

Figure: B4



Boring No. Forteen (14)	SUMMARY OF TEST RESULTS				
Depth 0'-3' feet	Moisture Content (%)	Dry Density (P.C.F.)	Height (in.)	Diameter (in.)	Swell Pressure (P.S.F.)
Initial	8.5	N/A	1.000	1.94	4100
Final	22.0	112.7	0.954	1.94	
Soil Description	Silt, some sand, brown				

SWELL - CONSOLIDATION TEST

Lambert and Associates

Project No.: D00147GE

Date: 7/5/00

Figure: B5

PRESSURE (POUNDS PER SQUARE FOOT)

10 100 1000 10000

Consolidation due to wetting under constant load

SWELL

% 5 4 3 2 1 0

CONSOLIDATION

% 1 2 3 4 5 6 7 8

Water added to sample

Boring No. Fifteen (15)	SUMMARY OF TEST RESULTS				
Depth 4.5' feet	Moisture Content (%)	Dry Density (P.C.F.)	Height (in.)	Diameter (in.)	Swell Pressure (P.S.F.)
Initial	18.2	112.0	1.000	1.94	Consolidation
Final	15.5	120.3	0.924	1.94	
Soil Description	Silt, some sand, brown				

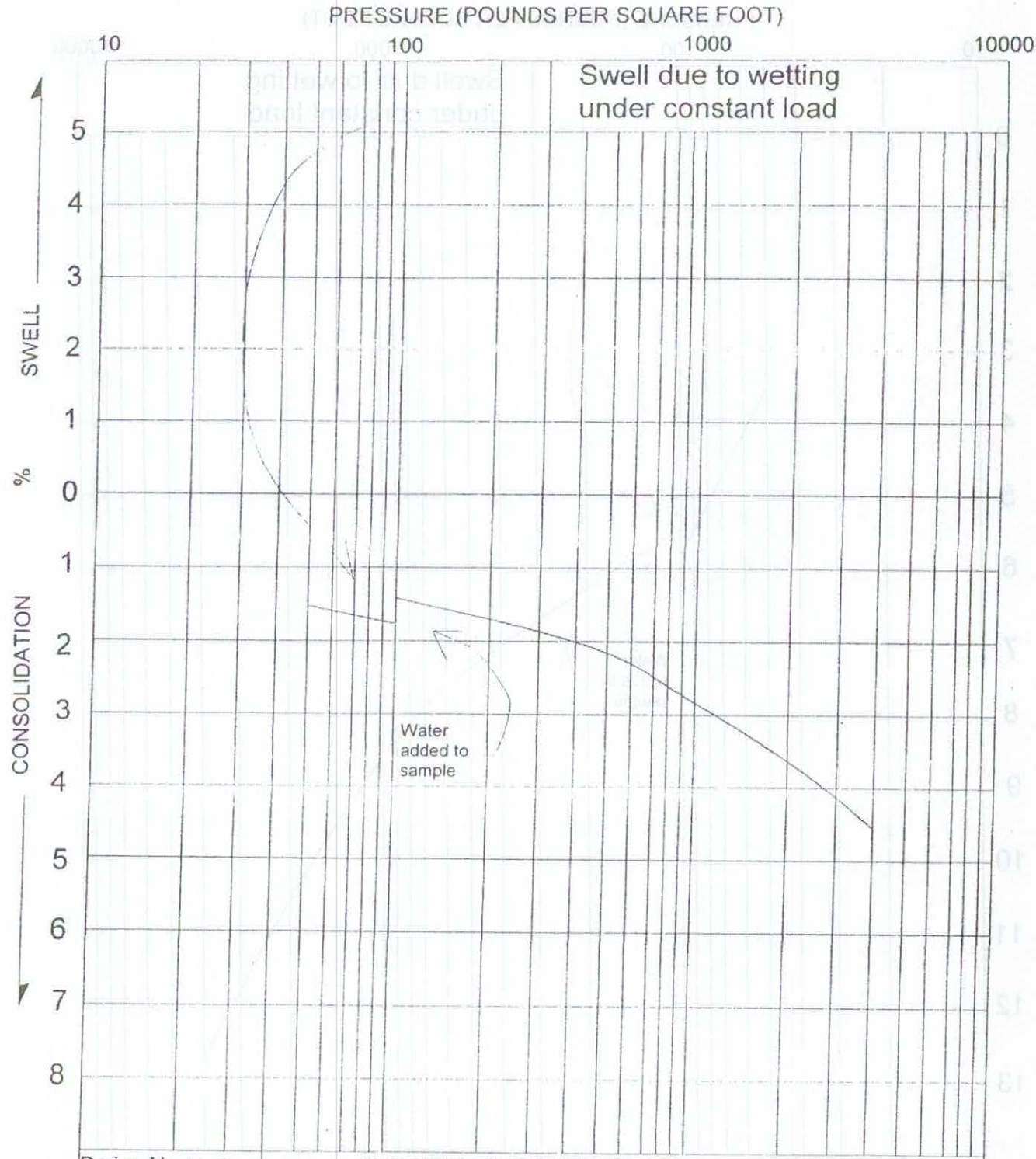
SWELL - CONSOLIDATION TEST

Project No.: D00147GE

Date: 7/5/00

Figure: B6

Lambert and Associates



Boring No. Sixteen (16)	SUMMARY OF TEST RESULTS				
Depth 0'-4.5' feet	Moisture Content (%)	Dry Density (P.C.F.)	Height (in.)	Diameter (in.)	Swell Pressure (P.S.F.)
Initial	9.0	119.0	1.000	1.94	650
Final	12.0	134.4	0.955	1.94	
Soil Description	Silt, some sand, brown				

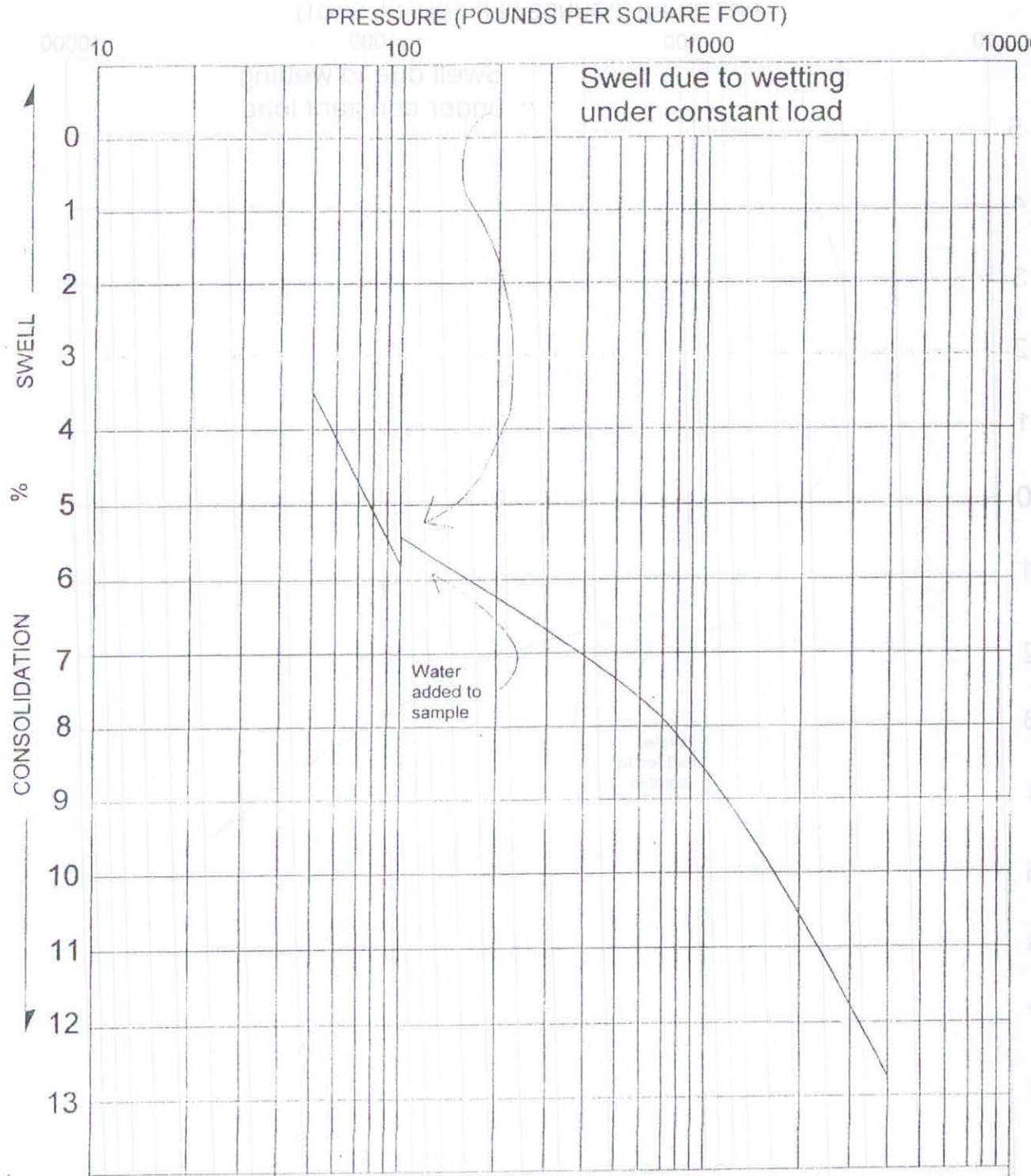
SWELL - CONSOLIDATION TEST

Lambert and Associates

Project No.: D00147GE

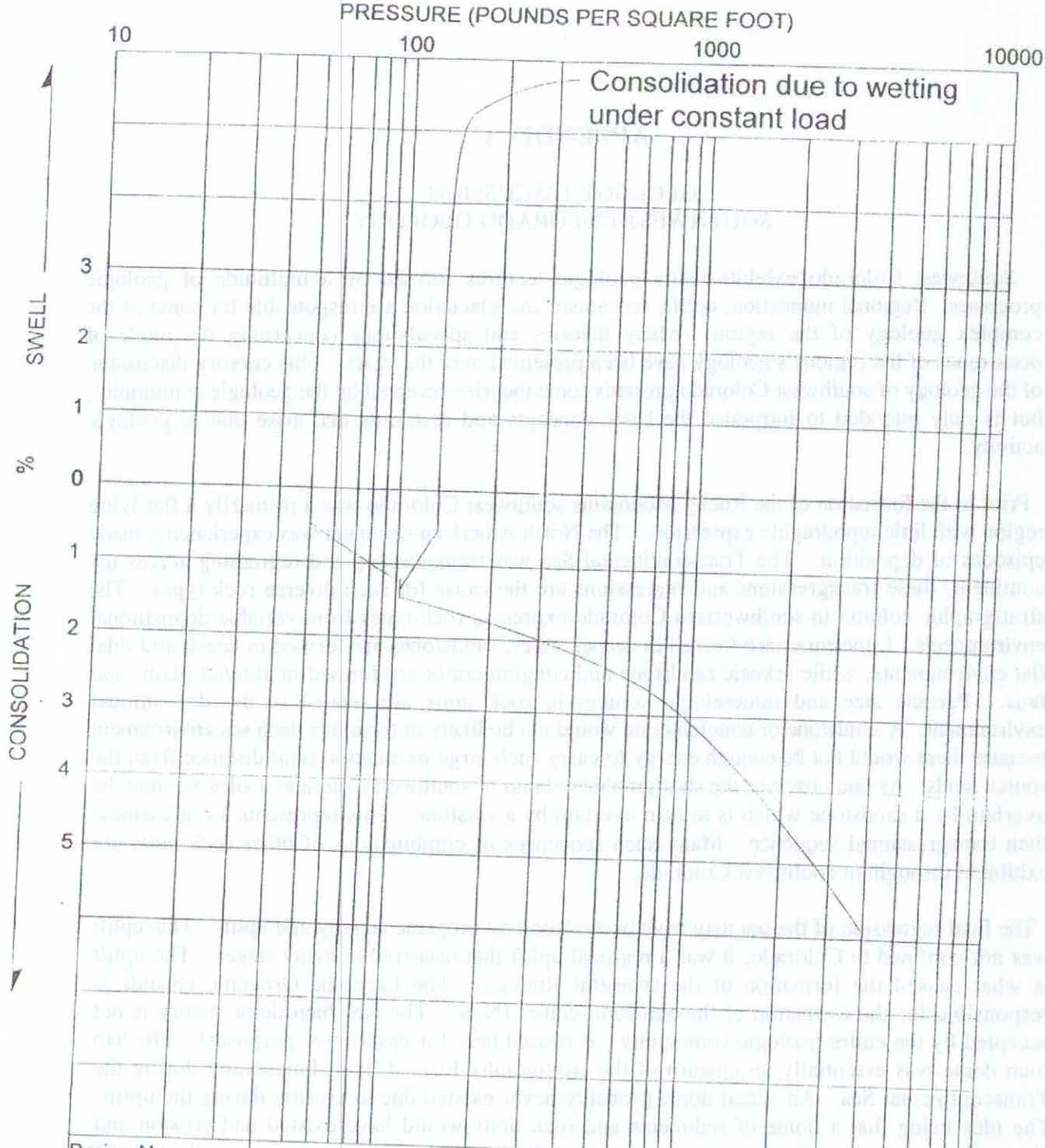
Date: 7/6/00

Figure: B7



Boring No. Twenty-eight (28)	SUMMARY OF TEST RESULTS				
Depth 4.5-9.5 feet	Moisture Content (%)	Dry Density (P.C.F.)	Height (in.)	Diameter (in.)	Swell Pressure (P.S.F.)
Initial	21.0	84.3	1.000	1.94	200
Final	33.2	83.0	0.873	1.94	
Soil Description	Silt, sand, dark brown, moist, organics				

SWELL - CONSOLIDATION TEST	Project No.: D00147GE
Lambert and Associates	Date: 8/1/00
	Figure: B9



Boring No. 28	SUMMARY OF TEST RESULTS				
Depth 9-1/2 feet	Moisture Content (%)	Dry Density (P.C.F.)	Height (in.)	Diameter (in.)	Swell Pressure (P.S.F.)
Initial	14.0	108.2	1.000	1.94	N/A
Final	20.0	110.8	0.941	1.94	
Soil Description	Sand, silt and gravel, moist, gray-brown (ML)				

SWELL - CONSOLIDATION TEST

Lambert and Associates

Project No.: D00147GE

Date: 10/06/00

Figure: B10

APPENDIX C

GEOLOGY DISCUSSION
SOUTHWEST COLORADO GEOLOGY

Southwest Colorado exhibits many geologic features formed by a multitude of geologic processes. Regional inundation, uplift, volcanism and glaciation are responsible for some of the complex geology of the region. Many theories and speculations concerning the mode of occurrence of the regions's geology have been presented over the years. This cursory discussion of the geology of southwest Colorado presents some theories accepted by the geologic community, but is only intended to introduce the basic concepts and restraints that arise due to geologic activity.

Prior to the formation of the Rocky Mountains southwest Colorado was a primarily a flat lying region with little topographic expression. The North American continent was experiencing many episodes of deposition. The Transcontinental Sea was transgressing and regressing across the continent, these transgressions and regressions are the cause for such diverse rock types. The stratigraphic column in southwestern Colorado expresses rock types from variable depositional environments. Limestones are formed in deeper water, sandstones are formed in beach and tidal flat environments, while arkosic sandstone and conglomerates are formed in alluvial plains and fans. Particle size and mineralogic content in rock units are related to the depositional environment. A sandstone or conglomerate would not be likely to form in a deep sea environment because there would not be enough energy to carry such large particles a great distance from the source lands. As one observes the stratigraphic column of southwest Colorado a siltstone may be overlain by a sandstone which is in turn overlain by a siltstone. This represents a regressional then transgressional sequence. Many such sequences or combinations of other rock units are exhibited throughout southwest Colorado.

The final regression of the sea may have been caused by orogenic activity and uplift. This uplift was not confined to Colorado, it was a regional uplift that occurred in many stages. The uplift is what caused the formation of the ancestral Rockies. The Larimide Orogenic episode is responsible for the formation of the San Juan dome. (Note: The San Juan dome theory is not accepted by the entire geologic community. It is used here for descriptive purposes). The San Juan dome was essentially an upwarp of the stratigraphy formed by sedimentation during the Transcontinental Sea. An actual dome probably never existed due to erosion during the uplift. The idea being that a dome of sediments and rock units would have existed had erosion and diastrophism not taken place.
The orientation of bedding planes forms a radial pattern around the San Juan region which seems to vindicate this theory.

The stresses need to "upwarp" this large area were obviously tremendous. Locally occurring stresses may not be sufficient to move this quantity of material, global tectonics, directly or indirectly, may have been involved. Compression of the entire North American plate could have occurred. The magnitude of the stresses and the deep seated origin of these stresses also have caused extensive volcanism. Colorado has many large remnants of Calderas that were active during the orogenic activity. The Silverton and Lake City Calderas are the largest in the San Juan region. Activity in the Silverton Caldera has been estimated (radiometrically) to have occurred 22 million years ago. Calderas of this magnitude are believed to have formed by the collapse of epierogenic magma chambers. Volcanic and metamorphic rock bodies are common in the San Juan region, many of these units are related to the orogenic activity in the region.

Faults associated with local orogenic activity are another common geologic feature found in southwestern Colorado. As stated previously, extreme stresses were probably associated with the formation of the San Juan Mountains and may be responsible for deep-seated volcanic and metamorphic processes. These stresses had to be released, the geologic mode for stress release is faulting. Diastrophic activity in the area today is quite low, the lack of seismic activity indicates that stresses are not currently being released. An explanation for the loss of stresses is through faulting.

The last episode of regional geologic activity in the area was glaciation. The most recent period of glacial activity ended approximately 10,000 years ago. Glacial activity is responsible for much of the topographic expression in the area. "U-Shaped" valleys, moraine deposits, tarns, (glacial formed lakes), and rock glaciers are the most prominent features which are found in southwestern Colorado as a result of glacial activity. The valley configurations are a result of the erosional activity of the glaciers. Moraine deposits developed during the glacial activity. Rock glaciers are moving masses of rock which are thought to have an ice core which may be the last remnant of glacial ice. As the subsurface ice core moves and melts, the overlying mass of rock also moves.

Current geologic processes which influence the region include; erosion and deposition of soil, landslide, rockfall, avalanche, and debris flow activity. All of the current geologic processes influence land use and development plans.

APPENDIX D

GENERAL GEOTECHNICAL ENGINEERING CONSIDERATIONS

D1.0 RADON CONSIDERATIONS

Information presented in "Radon Reduction in New Construction, An Interim Guide: OPA-87-009 by the Environmental Protection Agency dated August 1987 indicates that currently there are no standard soil tests or specific standards for correlating the results of soil tests at a building site with subsequent indoor radon levels. Actual indoor levels can be affected by construction techniques and may vary greatly from soil radon test results. Therefore it is recommended that radon tests be conducted in the structure after construction is complete to verify the actual radon levels in the home.

We suggest that you consider incorporating construction techniques into the development to reduce radon levels in the residential structures and provide for retrofitting equipment for radon gas removal if it becomes necessary.

Measures to reduce radon levels in structures include vented crawl spaces with vapor barrier at the surface of the crawl space to restrict radon gas flow into the structure or a vented gravel layer with a vapor barrier beneath a concrete slab-on-grade floor to allow venting of radon gas collected beneath the floor and to restrict radon gas flow through the slab-on-grade floor into the structure. These concepts are shown on Figure C1.

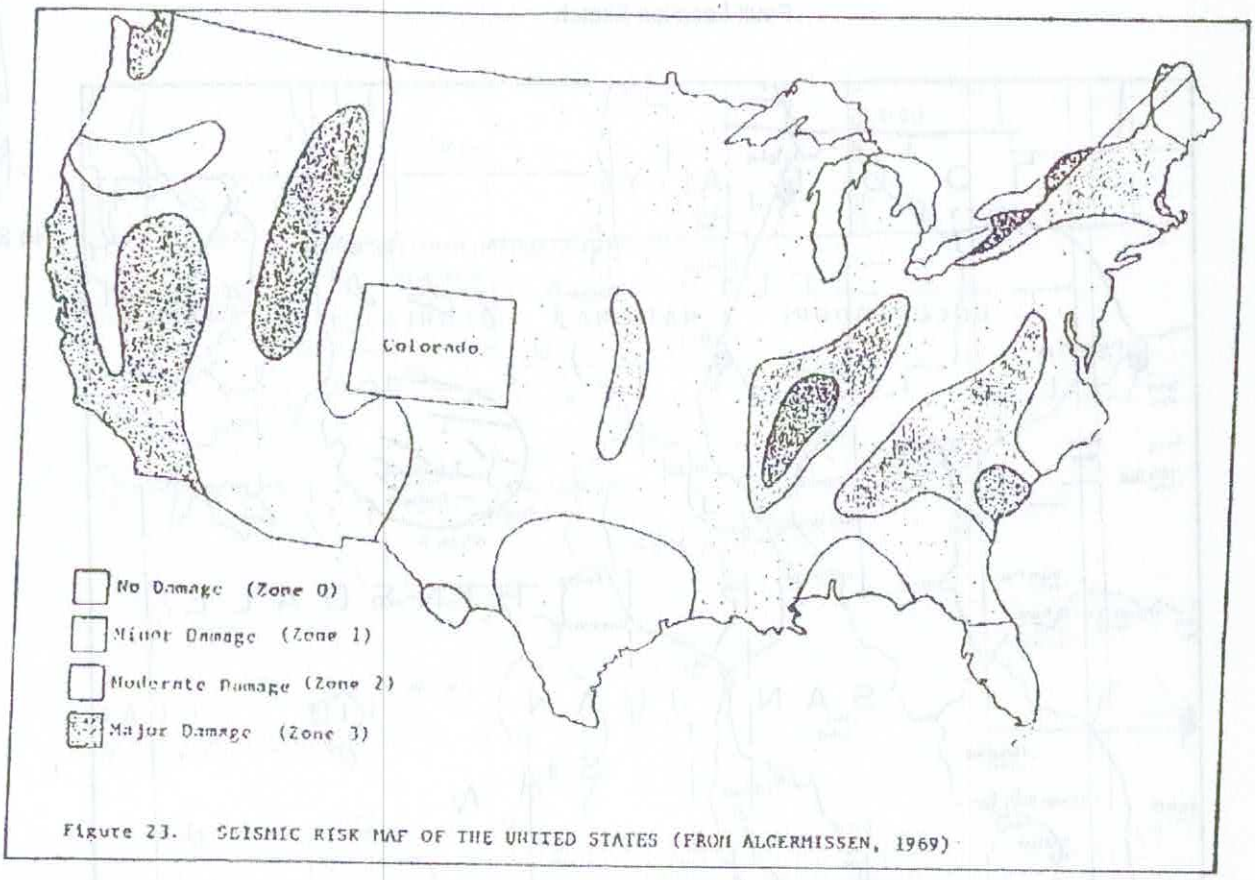


Figure 23. SEISMIC RISK MAP OF THE UNITED STATES (FROM ALGERMISSEN, 1969)

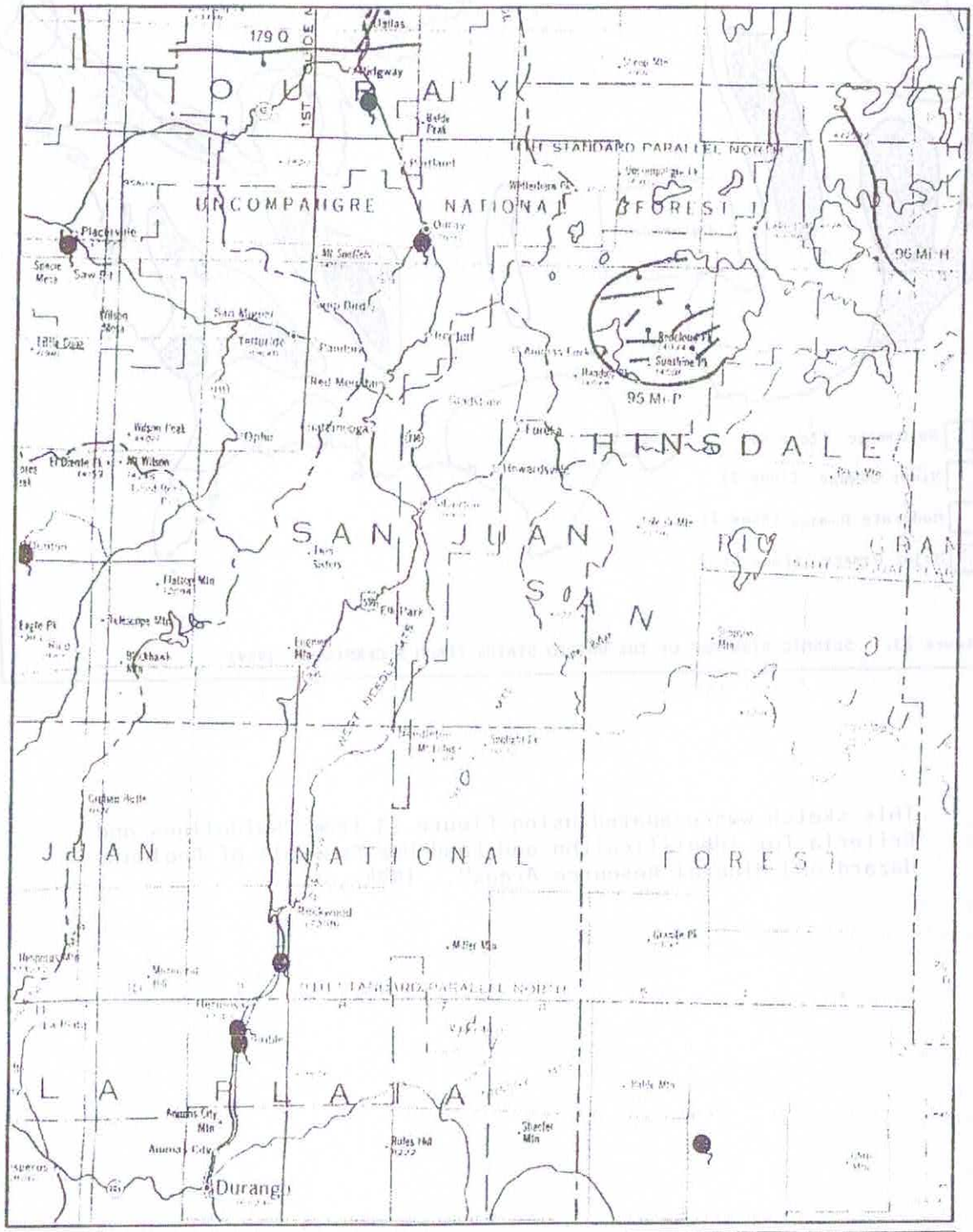
This sketch was prepared using Figure 23 from "Guidelines and Criteria for Identificaiton and Land Use Controls of Geolonic Hazard and Mineral Resource Areas". 1974

SEISMIC RISK MAP

Lambert and Associates

Project No.: D00147GB
Date: 8/18/00
Figure: 3

Fault Location Sketch



No Scale

This map was reproduced from Plate 2 of "Earthquake Potential in Colorado, A Preliminary Evaluation", 1981, Colorado Geological Survey, Bulletin 43.

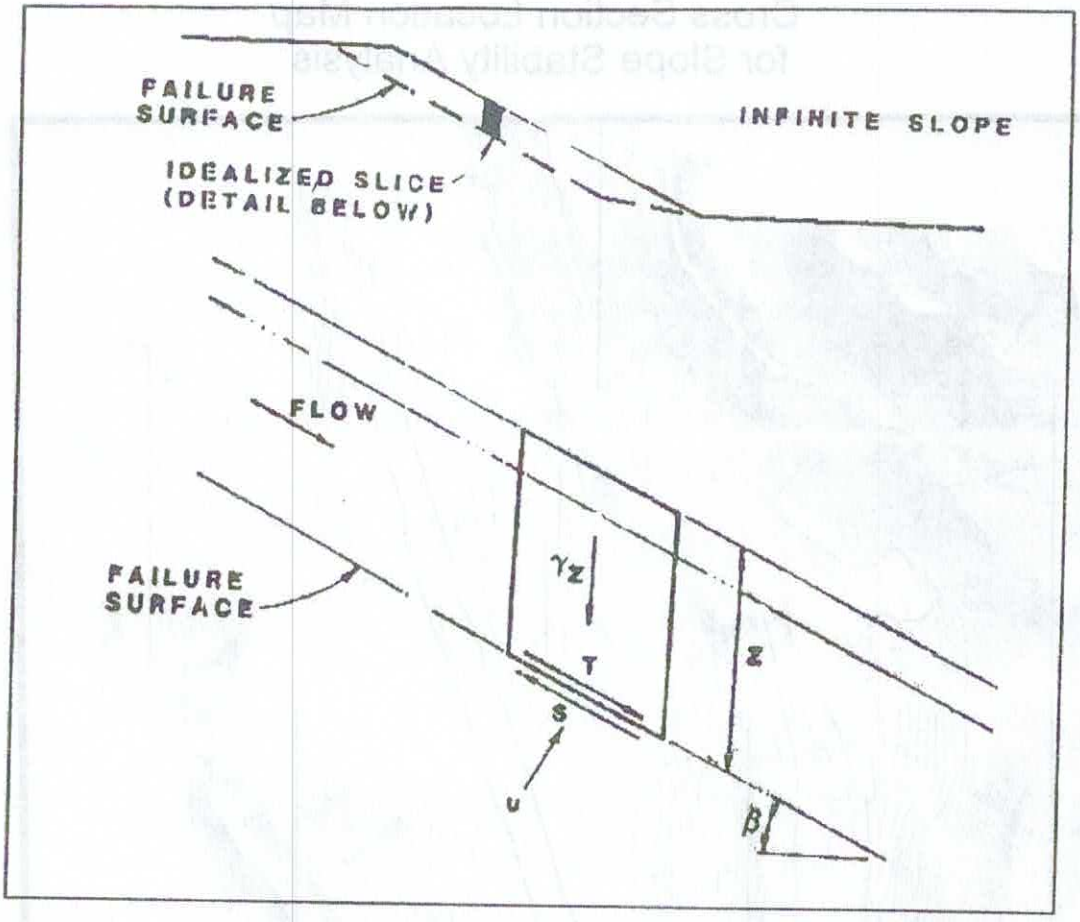
Symbols

Fault- ball on downthrown side

Hot-spring

Lambert and Associates

Project No. :	D00147GE
Date:	8/17/2000
Figure:	4



General Equation for Infinite Slope Analysis

$$\text{Factor of Safety} = \frac{C+(\gamma z \cos^2\beta - u)\tan\varphi}{\gamma z \sin\beta \cos\beta}$$

Where:

C= cohesion
φ= angle of internal friction
γ= density of soil
u= pore pressure on failure surface
z= depth
β= slope inclination

Example:

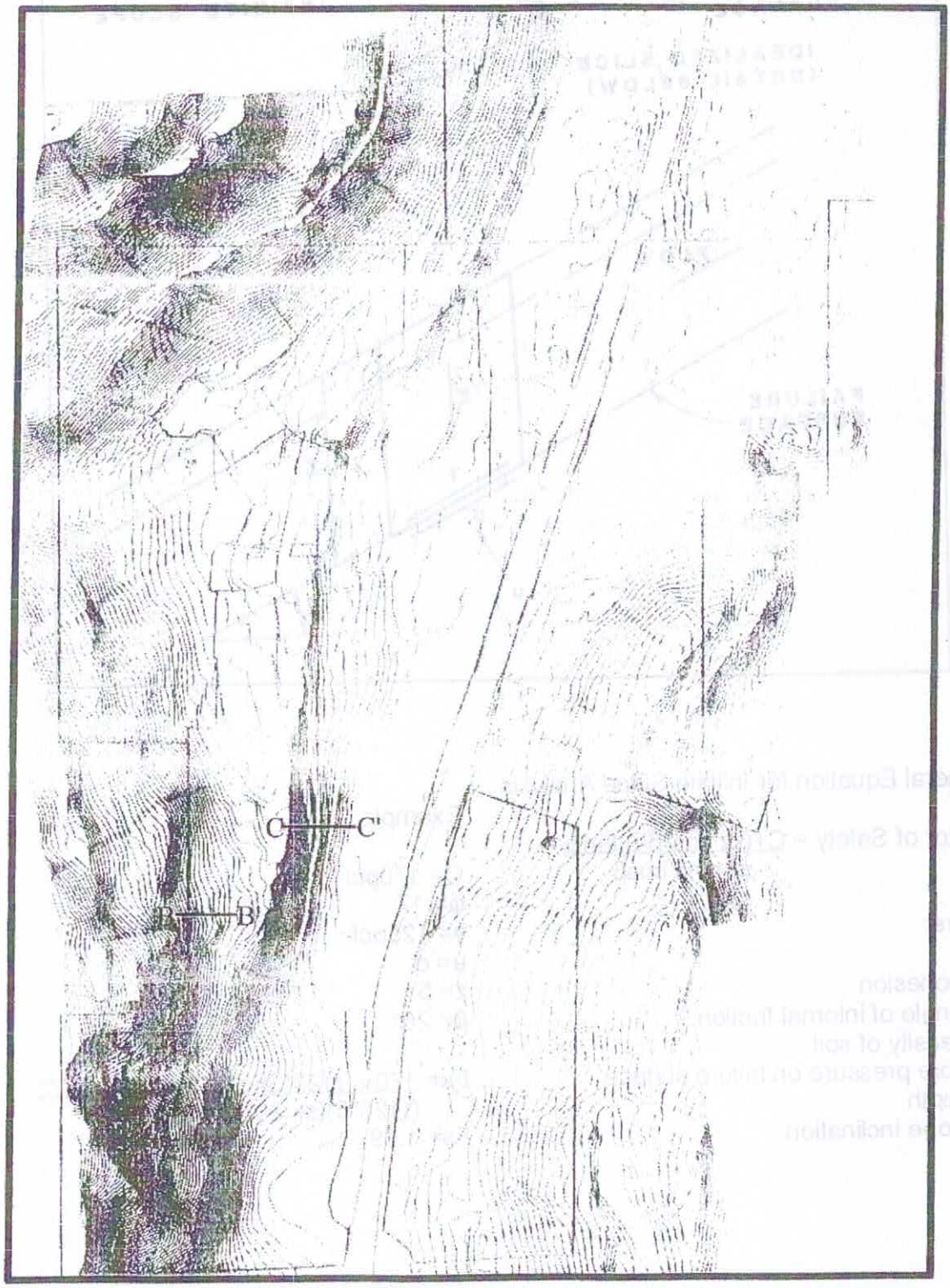
C= 170pcf
φ= 17
γ= 125pcf
u= o
z= 5'
β= 20°

$$Fs = \frac{170+((125*5)(\cos^2 20°-0))\tan 17°}{((125*5)(\sin 20°)(\cos 20°))}$$

Fs= 1.69

Infinite Slope Analysis for Determining Factor of Safety for Slopes

Cross Section Location Map for Slope Stability Analysis



No Scale

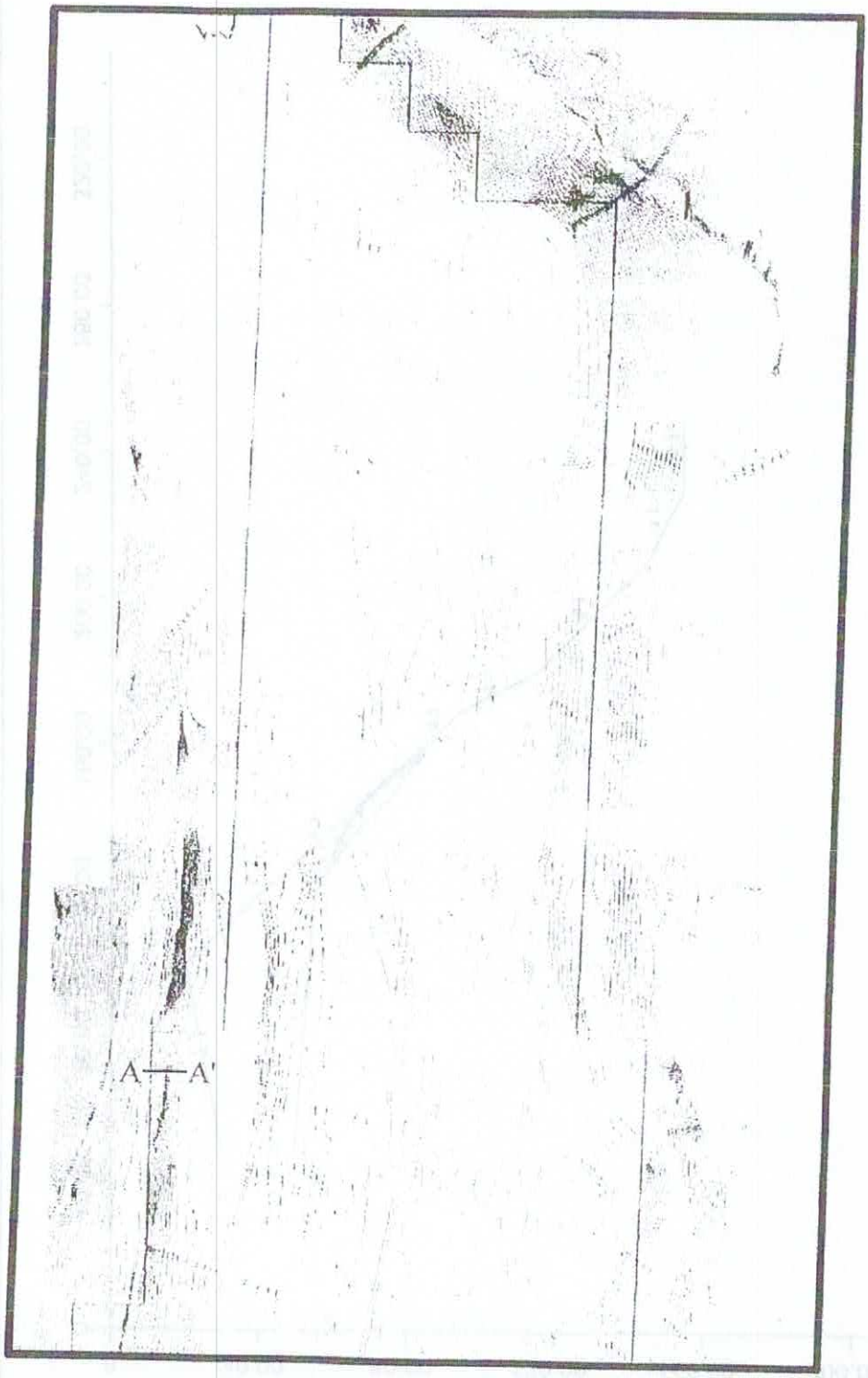
This map is intended to present geotecnical data only

Lambert and Associates

Project No.: D00147GE

Figure: 6A

Cross Section Location Map for Slope Stability Analysis



No Scale

This map is intended to present geotechnical data only.

Lambert and Associates

Project No.: D00147GE

Figure: 6B

Purgatory Resort/Section A–A'/Soil Stability

Soil	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
1	125.000	0.000	170.000	17.000
2	155.000	0.000	2000.000	20.000

Minimum Factor of Safety 1.263

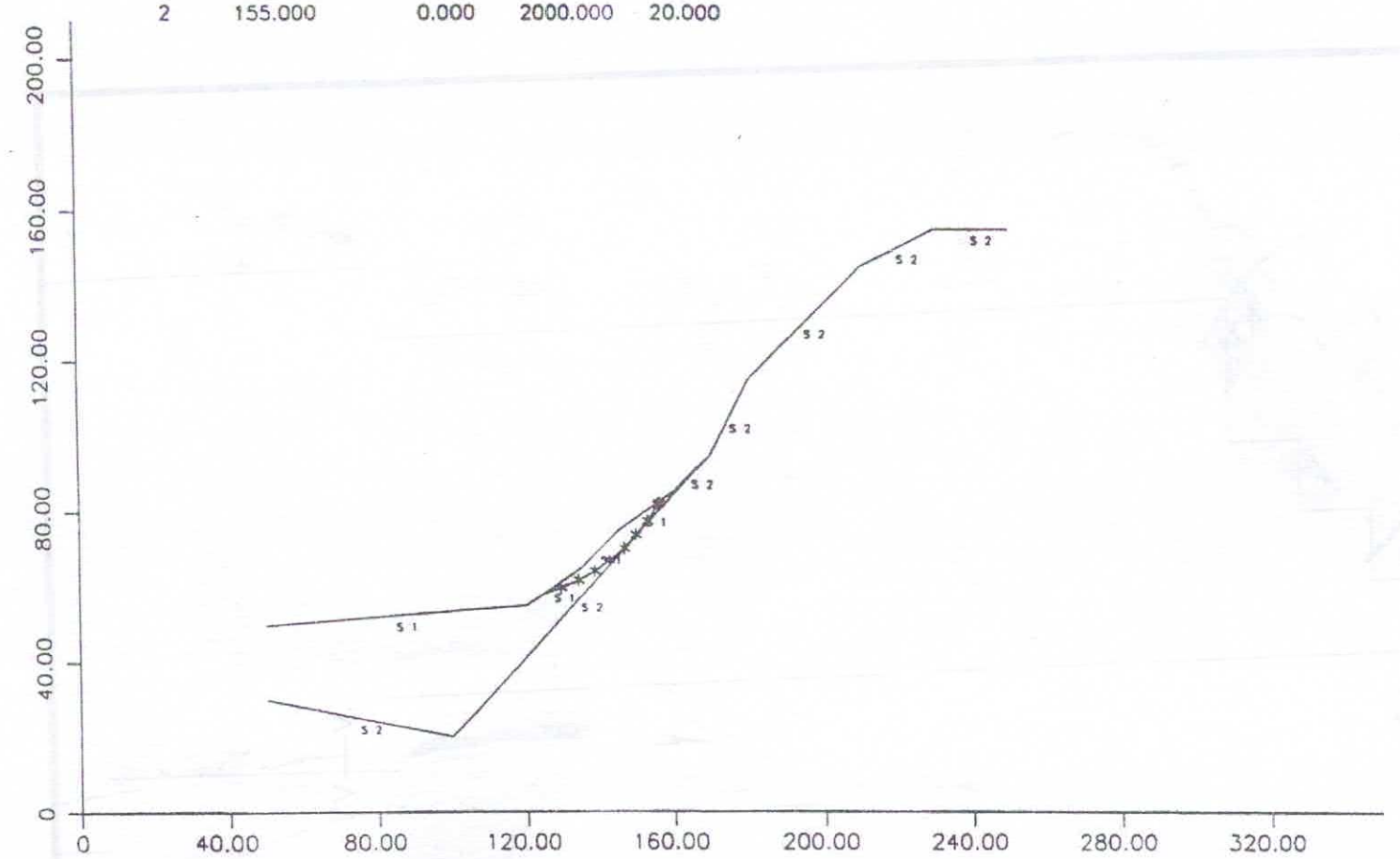


Figure 7

D0014796

Purgatory Resort Section B–B' Global Stability

Soil	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
1	125.000	0.000	170.000	17.000
2	150.000	0.000	2000.000	20.000

Minimum Factor of Safety 1.208

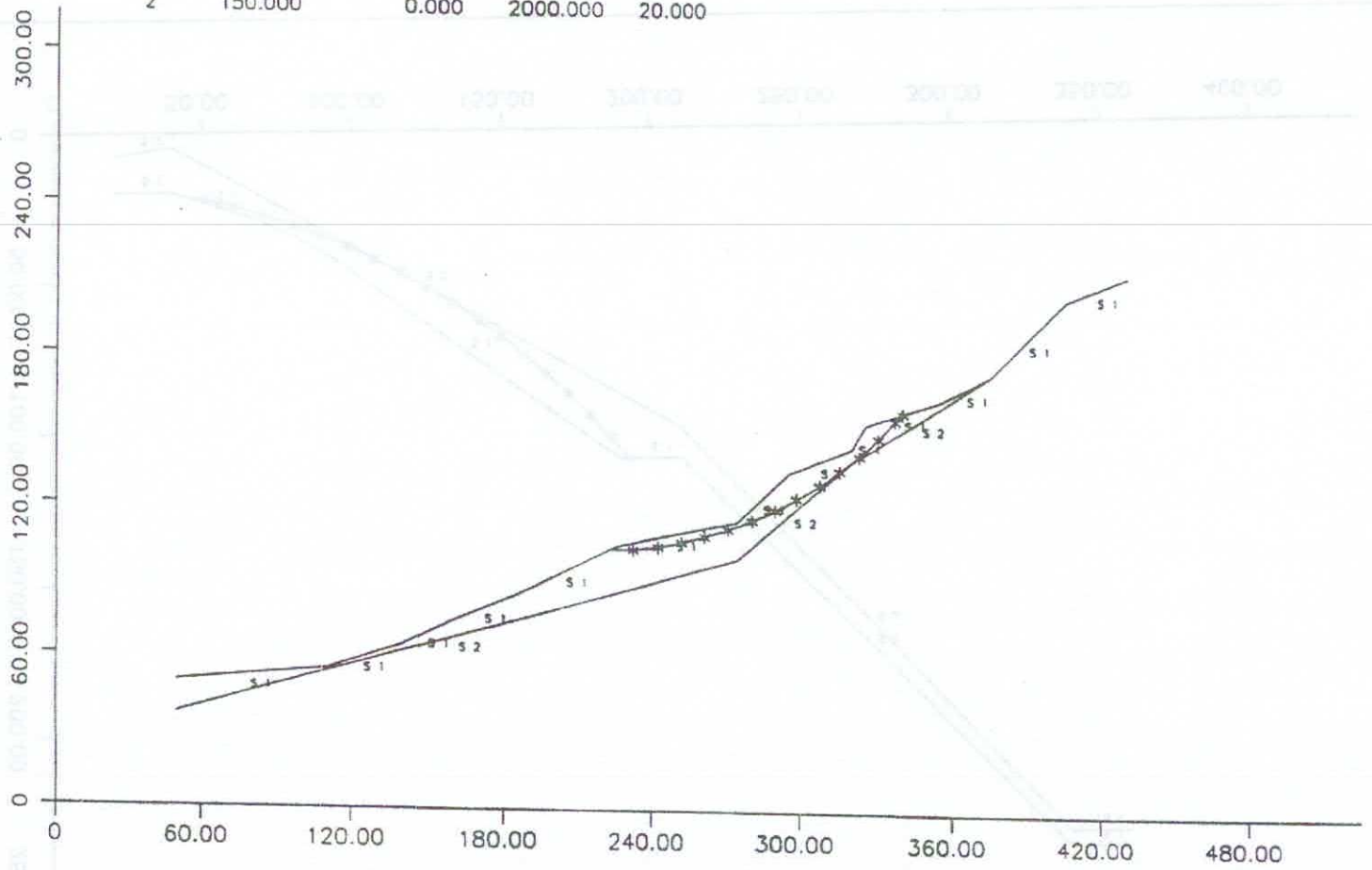


Figure 8

D00147GE

Landmark Consultants, Inc.

Purgatory Resort Section C–C' Global Stability

Soil	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
1	125.000	0.000	170.000	17.000
2	150.000	0.000	2000.000	20.000

Minimum Factor of Safety 1.345

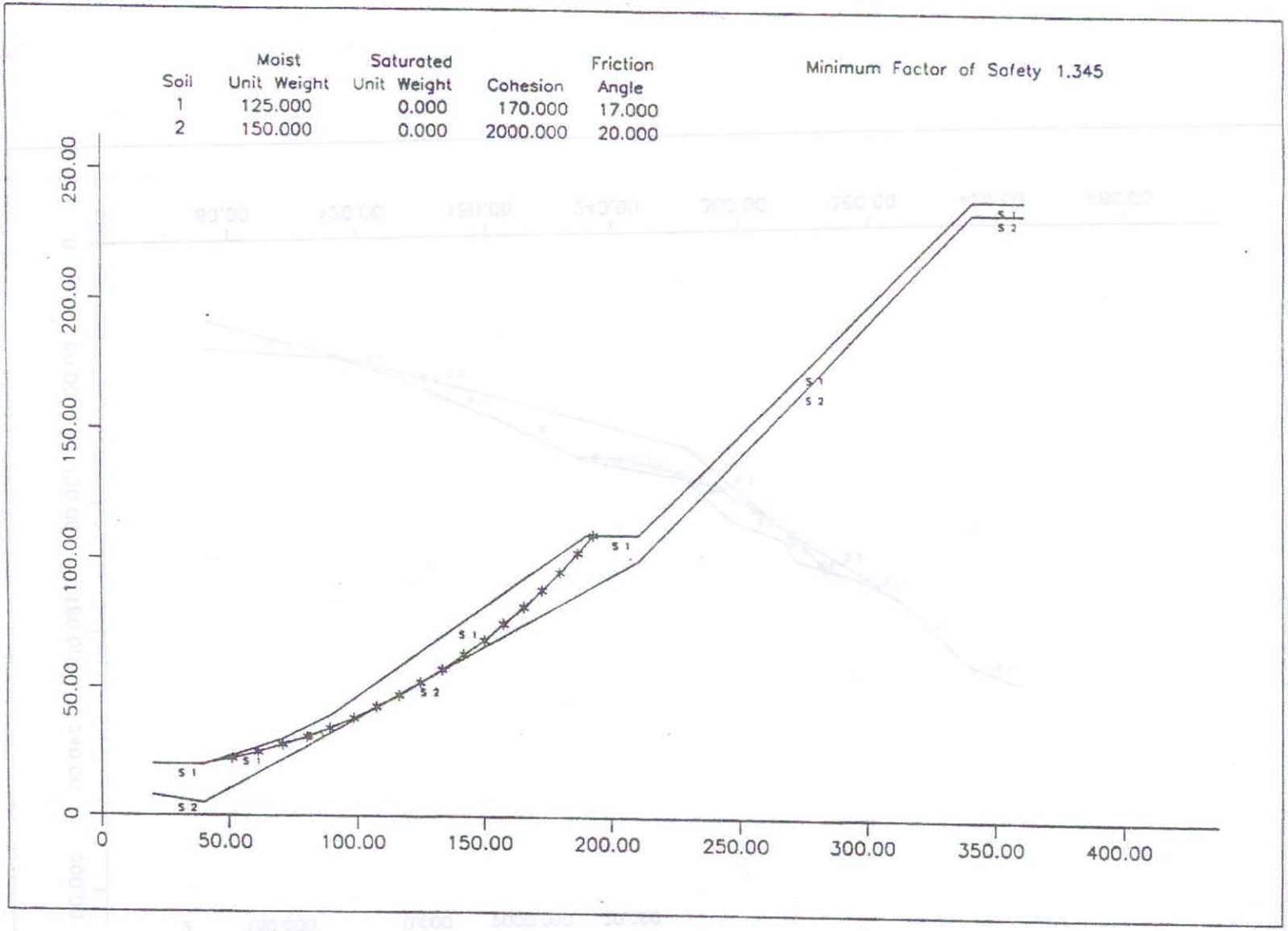


Figure 9

D00147GE

COLORADO DEPARTMENT OF TRANSPORTATION

STATE HIGHWAY ACCESS PERMIT APPLICATION

Issuing authority application acceptance date:

Instructions: ***Please print or type***

- Contact the Colorado Department of Transportation (CDOT) or your local government to determine your issuing authority.
- Contact the issuing authority to determine what plans and other documents are required to be submitted with your application.
- Complete this form (some questions may not apply to you) and attach all necessary documents and Submit it to the issuing authority.
- Submit an application for each access affected.
- If you have any questions contact the issuing authority.
- For additional information see CDOT's Access Management website at https://www.codot.gov/business/permits/accesspermits

1) Property owner (Permittee)		2) Applicant or Agent for permittee (if different from property owner)	
Ozone Cubed CO LLC		Michal Valencia	
Street address		Mailing address	
403 Corporate Woods Dr.		PO Box997	
City, state & zip	Phone #	City, state & zip	Phone # (required)
Magnolia, TX 77354	985-414-1706	Bayfield, CO 81122	970-749-6767
E-mail address		E-mail address if available	
coopercollins@yahoo.com		mikie.sds@gmail.com	

3) Address of property to be served by permit (required)
TBD Hwy 550 N, Durango, CO

4) Legal description of property: If within jurisdictional limits of Municipality, city and/or County, which one?

county	subdivision	block	lot	section	township	range
San Juan	Greyrock North			13	39N	9W

5) What State Highway are you requesting access from?
550

6) What side of the highway? ☐ N ☐ S ☐ E ☒ W

7) How many feet is the proposed access from the nearest mile post?
1930 feet ☒ N ☐ S ☐ E ☐ W) from: 50

How many feet is the proposed access from the nearest cross street?
3126 feet ☐ N ☒ S ☐ E ☐ W) from: Cascade Village Entranc

8) What is the approximate date you intend to begin construction?
3/1/2022

9) Check here if you are requesting a:
☒ new access ☐ temporary access (duration anticipated:) ☐ improvement to existing access
☐ change in access use ☐ removal of access ☐ relocation of an existing access (provide detail)

10) Provide existing property use
Vacant

11) Do you have knowledge of any State Highway access permits serving this property, or adjacent properties in which you have a property interest?
☒ no ☐ yes, if yes - what are the permit number(s) and provide copies: and/or, permit date:

12) Does the property owner own or have any interests in any adjacent property?
☒ no ☐ yes, if yes - please describe:

13) Are there other existing or dedicated public streets, roads, highways or access easements bordering or within the property?
☒ no ☐ yes, if yes - list them on your plans and indicate the proposed and existing access points.

14) If you are requesting agricultural field access - how many acres will the access serve?

15) If you are requesting commercial or industrial access please indicate the types and number of businesses and provide the floor area square footage of each.

business/land use	square footage	business	square footage

16) If you are requesting residential developement access, what is the type (single family, apartment, townhouse) and number of units?

type	number of units	type	number of units
Single Family	1		

17) Provide the following vehicle count estimates for vehicles that will use the access. Leaving the property then returning is two counts.

Indicate if your counts are ☐ peak hour volumes or ☒ average daily volumes.	# of passenger cars and light trucks at peak hour volumes	# of multi unit trucks at peak hour volumes
	4	0
# of single unit vehicles in excess of 30 ft.	**# of farm vehicles (field equipment)**	**Total count of all vehicles**
0	0	4

COLORADO DEPARTMENT OF TRANSPORTATION

STATE HIGHWAY ACCESS PERMIT APPLICATION

Issuing authority signature

Issuance date

Instructions:

Please print or type

- Contact the Colorado Department of Transportation (CDOT) or your local agency to determine who issuing authority
- Contact the issuing authority to obtain a fully filled and other documents are required to be submitted with your application.
- Complete the form (add a continuation page if necessary to answer all items). If necessary, describe and submit it to the issuing authority.
- Submit an application for each access affected.
- If you have any questions contact the issuing authority.

For additional information, see CDOT's Access Management website at: http://www.coloradodot.info/programs/accessmanagement/permits.html

1) Property owner (Permittee)

Name

Street address

City, state & zip

Telephone no.

E-mail address

2) Applicant (if different from property owner)

Name

Mailing address

City, state & zip

Telephone no. (required)

E-mail address (if available)

3) Address of property to be served (if known)

4) Legal description of property (within same general area) of Municipality, city and or County, which may

County Subdivision Lot Block Section Township Range

5) What State Highway are you requesting access from?

6) What side of the highway?

N S E W

7) How many feet is the proposed access from the nearest mile post?

8) What is the approximate date you intend to begin construction?

9) Check here if you are requesting a:

new access temporary access (complete temporary) improvement to existing access

change in access use removal of access relocation of access (provide detail)

10) Provide existing property use

Vacant

11) Do you have knowledge of any State Highway access permits serving this property, or adjacent properties on which you have a property interest?

No Yes, if yes: what are the permit number(s) and provide copies

Anchor point / mile

12) Does the property owner own or have any interests in any adjoining property?

No Yes, if yes: please describe

13) Are there other existing or planned future streets, roads, highways or access ways contiguous to bordering or within the property?

No Yes, if yes: list them on your plans and include the proposed and existing access types

14) If you are requesting agricultural field access, how many acres will the access serve?

15) If you are requesting commercial or industrial access, provide the type and number of businesses and square feet of floor area types lodging at each

Business/land use Square footage Business/land use Square footage

16) If you are requesting residential development access, provide the type, number of units, and number of units

Type Number of units Type Number of units

SFR Duplex Family

17) Provide the following vehicle count estimates for vehicles that will use the access. Leaving the property during morning is two counts

Include if your counts are

Peak hour volumes or Average daily volumes

Total count of all vehicles

Total count of all vehicles

Page 1 of 6 CDOT Form #137 12/19

18) Check with the issuing authority to determine which of the following documents are required to complete the review of your application.

a) Property map indicating other access, bordering roads and streets.
b) Highway and driveway plan profile.
c) Drainage plan showing impact to the highway right-of-way.
d) Map and letters detailing utility locations before and after development in and along the right-of-way.
e) Subdivision, zoning, or development plan.
f) Proposed access design.
g) Parcel and ownership maps including easements.
h) Traffic studies.
i) Proof of ownership.

1- It is the applicant's responsibility to contact appropriate agencies and obtain all environmental clearances that apply to their activities. Such clearances may include Corps of Engineers 404 Permits or Colorado Discharge Permit System permits, or ecological, archeological, historical or cultural resource clearances. The CDOT Environmental Clearances Information Summary presents contact information for agencies administering certain clearances, information about prohibited discharges, and may be obtained from Regional CDOT Utility/Special Use Permit offices or accessed via the CDOT Planning/Construction-Environmental-Guidance webpage: **https://www.codot.gov/programs/environmental/resources/guidance-standards/environmental-clearances-info-summary-august-2017/view**

2- All workers within the State Highway right of way shall comply with their employer's safety and health policies/procedures, and all applicable U.S. Occupational Safety and Health Administration (OSHA) regulations - including, but not limited to the applicable sections of 29 CFR Part 1910 - Occupational Safety and Health Standards and 29 CFR Part 1926 - Safety and Health Regulations for Construction.

Personal protective equipment (e.g. head protection, footwear, high visibility apparel, safety glasses, hearing protection, respirators, gloves, etc.) shall be worn as appropriate for the work being performed, and as specified in regulation. At a minimum, all workers in the State Highway right of way, except when in their vehicles, shall wear the following personal protective equipment: High visibility apparel as specified in the Traffic Control provisions of the documentation accompanying the Notice to Proceed related to this permit (at a minimum, ANSI/ISEA 107-1999, class 2); head protection that complies with the ANSI Z89.1-1997 standard; and at all construction sites or whenever there is danger of injury to feet, workers shall comply with OSHA's PPE requirements for foot protection per 29 CFR 1910.136, 1926.95, and 1926.96. If required, such footwear shall meet the requirements of ANSI Z41-1999.

Where any of the above-referenced ANSI standards have been revised, the most recent version of the standard shall apply.

3- The Permittee is responsible for complying with the Revised Guidelines that have been adopted by the Access Board under the American Disabilities Act (ADA). These guidelines define traversable slope requirements and prescribe the use of a defined pattern of truncated domes as detectable warnings at street crossings. The new Standards Plans and can be found on the Design and Construction Project Support web page at:
https://www.codot.gov/business/civilrights/ada/resources-engineers

If an access permit is issued to you, it will state the terms and conditions for its use. Any changes in the use of the permitted access not consistent with the terms and conditions listed on the permit may be considered a violation of the permit.

The applicant declares under penalty of perjury in the second degree, and any other applicable state or federal laws, that all information provided on this form and submitted attachments are to the best of their knowledge true and complete.

I understand receipt of an access permit does not constitute permission to start access construction work.

Applicant or Agent for Permittee signature	Print name	Date
Michal Valencia	Michal Valencia	11/17/2021

If the applicant is not the owner of the property, we require this application also to be signed by the property owner or their legally authorized representative (or other acceptable written evidence). This signature shall constitute agreement with this application by all owners-of-interest unless stated in writing. If a permit is issued, the property owner, in most cases, will be listed as the permittee.

Property owner signature	Print name	Date
Cooper Collins	Cooper Collins	11/17/2021

Michal Valencia

From: Michal Valencia <mikie.sds@gmail.com>
Sent: Wednesday, January 26, 2022 3:07 PM
To: 'Reider - CDOT, Randee'
Cc: 'Cassi Sattazahn - CDOT'
Subject: RE: CDOT Access permit application for Ozone Cubed CO LLC
Attachments: OZONE CUBED CO LLC - SINGLE MEMBER LLC AGREEMENT (1).pdf; Ozone Signed CDOT App updated.pdf; Access west.jpg; Access north.jpg; Access south.jpg

Hi Randee,

Thank you so much for your response. I have attached the operating agreement for the LLC showing the signature authority you requested and have adjusted the location of the access 130 north to align with the access on the east side, as preferred. I revised the first page of the application to show this new location and have updated the images as well.

I used Google Earth to determine sight distance. From the new access location in street view I found points on the road and measured to them. The sight distance to the north is 600 feet. The sight distance to the south is over 700 feet.

Please let me know if you need anything else to process the application.

Thanks,
Mikie

Michal Valencia, P.E.
Site Development Solutions, LLC Mikie.SDS@gmail.com 970-749-6767

From: Reider - CDOT, Randee <randee.reider@state.co.us>
Sent: Monday, January 3, 2022 11:43 AM
To: mikie.sds@gmail.com
Cc: Cassi Sattazahn - CDOT <cassi.sattazahn@state.co.us>
Subject: Re: CDOT Access permit application for Ozone Cubed CO LLC

Hi Michael,

Thank you for submitting the CDOT Access Permit application.

In order to process the application, the following items are required:

- Signature authority for Mr. Collins to sign the CDOT Access permit on behalf of Ozone Cubed CO, LLC.
- CDOT's preference for the access location is directly across from the access on the east side of the highway, in order to avoid conflicting left turning movements. Please also confirm the minimum sight distance of 550' in both directions on US 550.

Please let me know if you have any questions.

Thank you,
Randee Reider

Michal Valencia

From: Michal Valencia <mikiesda@gmail.com>
Sent: Wednesday, January 26, 2022 3:07 PM
To: 'Reider - CDOT, Randee'
Cc: 'Cassi Sattarahn - CDOT'
Subject: RE: CDOT Access permit application for Ozone Cubed CO LLC
Attachments: OZONE CUBED CO LLC - SINGLE MEMBER LLC AGREEMENT (1).pdf; Ozone Signed CDOT App updated.pdf; Access west.jpg; Access north.jpg; Access south.jpg

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Please let me know if you need anything else to process the application.

Thanks,
Mike

Michael Valencia, P.E.
Site Development Solutions, LLC | mike.SDS@gmail.com | 970-749-6767

From: Reider - CDOT, Randee <randee.reider@state.co.us>
Sent: Monday, January 3, 2022 11:43 AM
To: mike.sds@gmail.com
Cc: Cassi Sattarahn - CDOT <cassi.sattarahn@state.co.us>
Subject: Re: CDOT Access permit application for Ozone Cubed CO LLC

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- CDOT's preference for the access location is directly across from the access on the east side of the highway, in order to avoid conflicting left turning movements. Please also confirm the minimum sight distance of 820' in both directions on US 550.

Please let me know if you have any questions.

Thank you,
Randee Reider

Access Manager
Region 5 - Traffic & Safety

P 970.385.3626 | F 970.385.8361
3803 N. Main Ave., Suite 100, Durango, CO 81301
randee.reider@state.co.us | www.codot.gov | www.cotrip.org

On Fri, Dec 17, 2021 at 2:35 PM Michal Valencia <mikie.sds@gmail.com> wrote:

Hi Randee,

Please see attached permit application and supporting documents. This parcel does not have a deeded access or easement to any other roadway. We are pursuing a Land Use Improvement Permit with San Juan County and need access for a single-family home. See attached:

- Permit application
- Recorded Deed
- Survey Plat
- Aerial image
- Title work
- Photos of access and north/south views along Hwy 550

Please let me know if you have any questions or need anything else to process the application.

Thanks,

Mikie

Michal Valencia, P.E.

Site Development Solutions, LLC Mikie.SDS@gmail.com 970-749-6767

I would love your feedback. Please post a review to my Google profile.
https://g.page/sdscolorado/review?rc

Access Manager
Region 5 - Traffic & Safety

P 970.385.3626 | F 970.385.8761
3803 N. Main Ave., Suite 100, Durango, CO 81301
randee.trelder@state.co.us | www.codot.gov | www.cotrip.org

On Fri, Dec 17, 2021 at 2:35 PM Mikhail Valencia <mikie.sd@gmail.com> wrote:

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- Photos of access and north/south views along Hwy 550

Please let me know if you have any questions or need anything else to process the application.

Thanks,

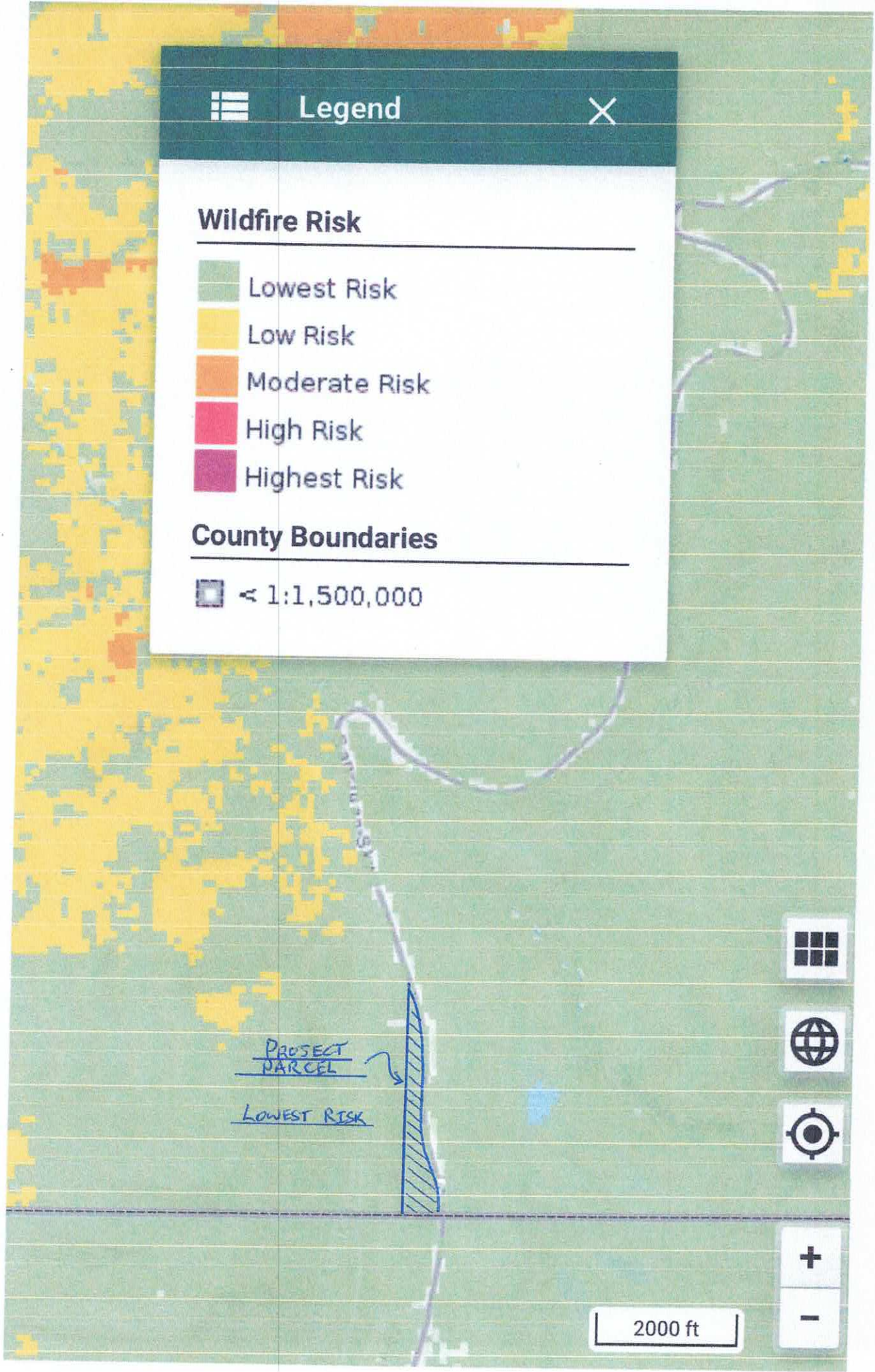
Mikie

Mickael Valencia, P.E.

Site Development Solutions, LLC | Mikie.SDS@gmail.com | 970-749-6762

I would love your feedback. Please post a review to my Google profile.
https://g.page/d/r/review


Ozone Cubed CO LLC
Access point looking west
Legend
Google Earth
© 2022 Google
N


Legend
Wildfire Risk
Lowest Risk
Low Risk
Moderate Risk
High Risk
Highest Risk
County Boundaries
< 1:1,500,000
PROJECT PARCEL
LOWEST RISK
2000 ft

Legend

Wildfire Risk

- Lowest Risk
- Low Risk
- Moderate Risk
- High Risk
- Highest Risk

County Boundaries

- < 1:1,500,000

Scenic Quality Report

1. Introduction and Site Location

The following is a Scenic Quality Report for the proposed Collins Residence, located on 37.62 acres off of Hwy 550. The property is located on the West side of the road starting with the Southern property line being the same as the county line. The property is part of the Purgatory Master Plan created in 2000. Please see the attached master plan for exact location.

TBD Hwy 550 San Juan County, Colorado
"Greyrock Village North"
37.62 Acres Located in Section 13
Township 39 North, Range 9 West

2. Project Site and Proposed Residence Location

The proposed residence location is on the West side of the property and in a natural clearing surrounded by trees. Please see the attached aerial photographs and photos.

3. Visibility of the Residence from HWY 550

The homesite is not easily viewed from Hwy 550 as the land is heavily populated with trees and the residence is situated close to the West property line.

4. Views FROM the Proposed Residence

Please see the attached photos taken from the proposed home site.

5. Location of Structure Minimizes Visibility for Public Lands and Hwy 550

The location of the home is not easily viewed from Hwy 550 or from public lands.

6. Building Design and the Natural Topography and Vegetation

The homesite is planned to be in a natural clearing surrounded by trees that you cannot view from Hwy 550. It is our intention to limit how much can be seen from Hwy 550 or from public lands, this includes the driveway and all improvements; please reference the Site Plan.

7. Topsoil, Utilities, Lighting, and Driveways

We intend to make use of the natural topography and topsoil onsite and disturb as little as possible to limit the viewable disturbance. Utilities will all be placed below grade and not viewable. The driveway is designed in a way to minimize visual impact from Hwy 550 or public lands. Exterior lighting will be limited to security lights and low impact landscape lighting.

Scenic Quality Report

1. Introduction and Site Location

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"TBD" Hwy 550 San Juan County, Colorado
"Greyrock Village North"
37.62 Acres Located in Section 13
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We intend to make use of the natural topography and topsoil onsite and disturb as little as possible to limit the viewable disturbance. Utilities will all be placed below grade and not viewable. The driveway is designed in a way to minimize visual impact from Hwy 550 or public lands. Exterior lighting will be limited to security lights and low impact landscape lighting.

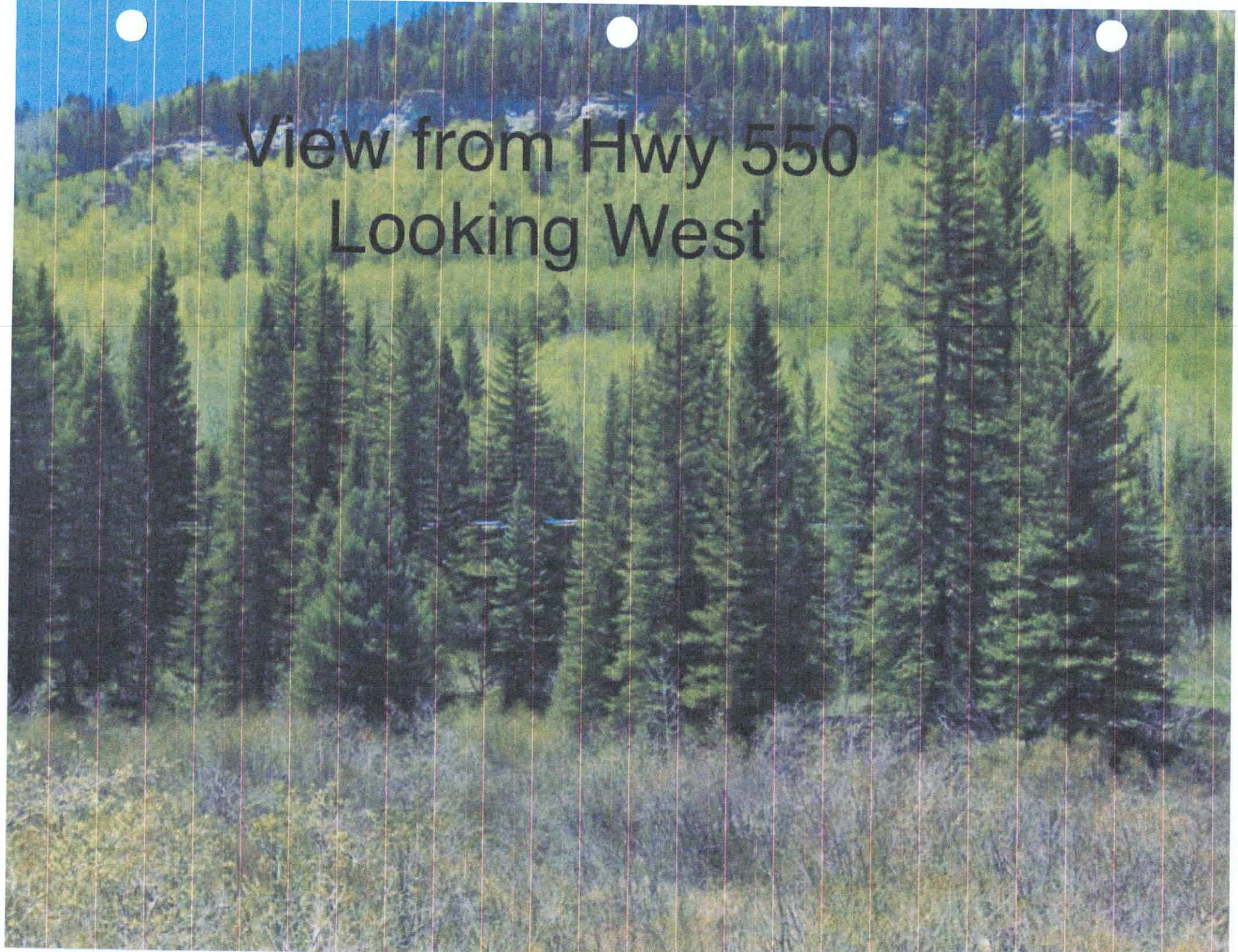
8. Building Materials

The building materials used on the exterior of the home will be of colors and textures found naturally in the landscape or that complement the surroundings.

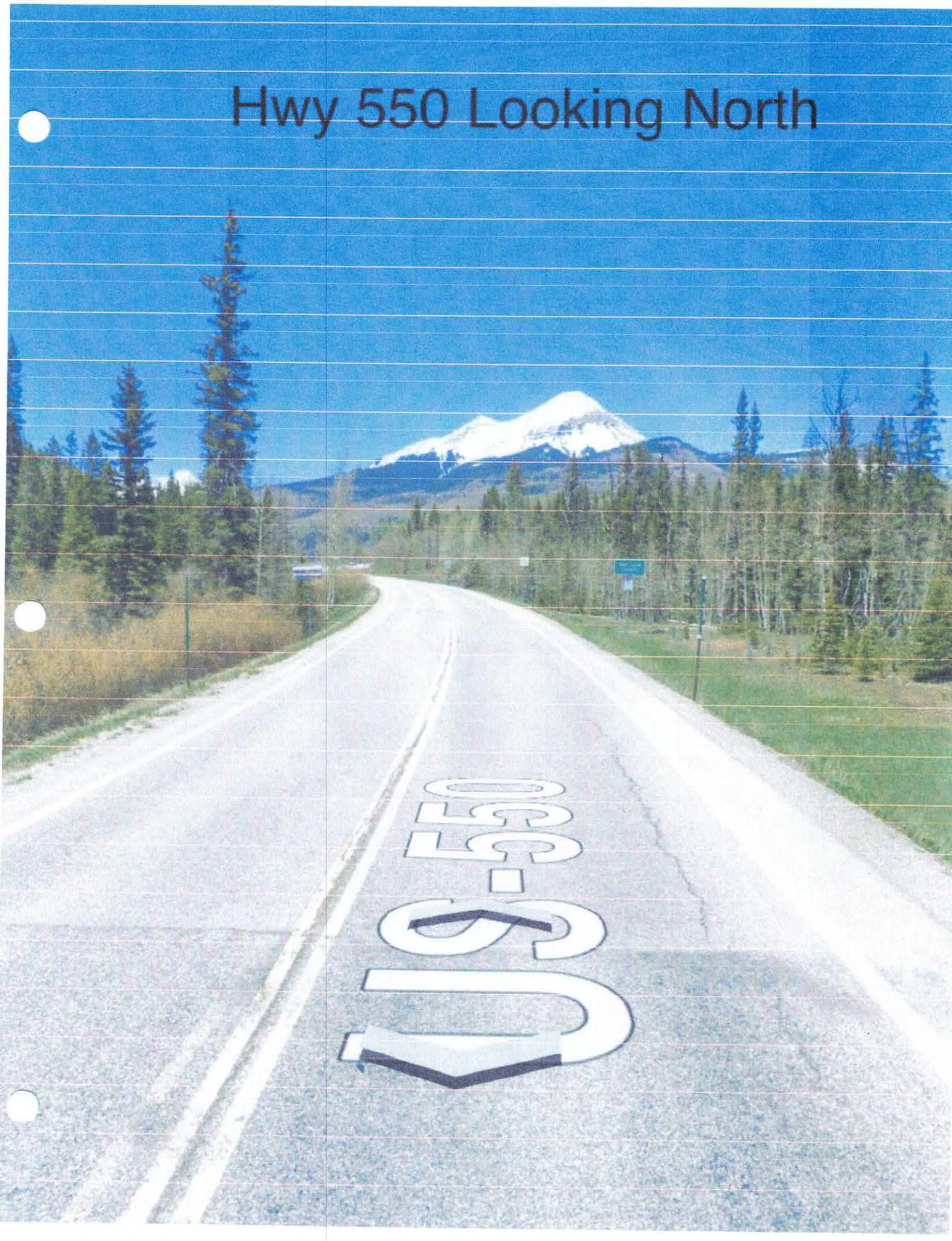
9. Conclusion

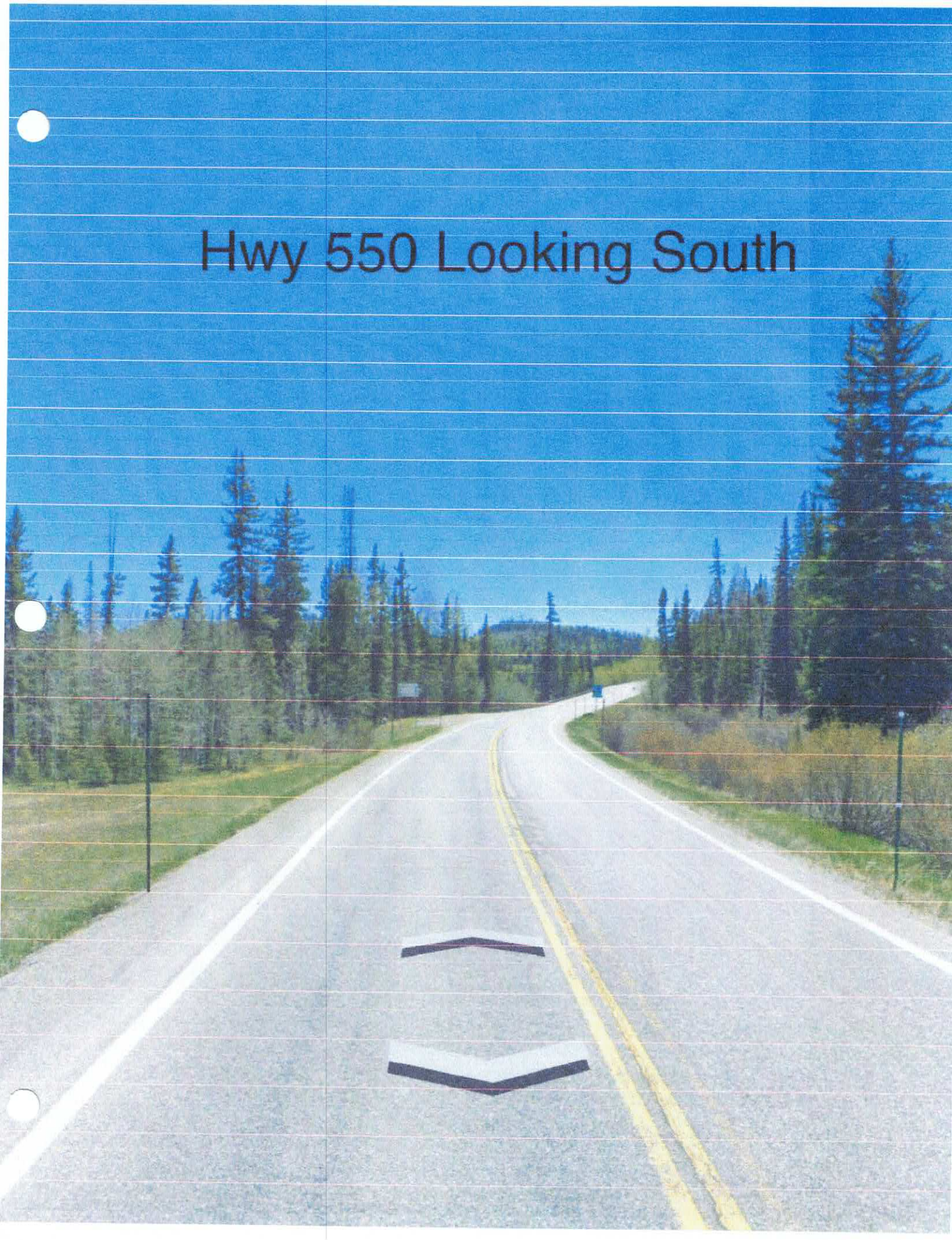
This project aims to conform to the County Scenic Quality Regulation as shown in this report and is believed to do so as summarized below.

The applicant has chosen a suitable building envelope that allows all county required setbacks to be met, uses the available natural features of the land to decrease the impact to the scenery. The residence is located near the west property line away from direct visibility from HWY 550. The building materials chosen for this project have been chosen to fit within the "mountain modern" theme and do not boast bright colors but rather blend in with the landscape and expectations of a mountain resort.


View from Hwy 550
Looking West

Hwy 550 Looking North




Hwy 550 Looking South

ENVIRONMENTAL CONSULTANTS

December 22, 2021

--ATTACHMENT A--
GRAYROCK VILLAGE NORTH
DMR 404 PERMIT TASKS
(See project limits/study area attached)

Background Information

Grayrock Village North is within the project are of an existing 404 Permit held by Durango Mountain Resort (DMR) as the master developer. A condition of the permit dictates that the development plans of any eventual purchaser of property within the 404 Permit Area are subject to the 404 Permit and all the conditions thereof.

404 Permit Tasks

Assist client in ensuring proposed development plan complies with the DMR 404 Permit including any necessary, impact/preserve wetland and wetland buffer impacts/mitigation including: interface with project engineer and contractor, mapping/GIS analysis, preparation of documentation as necessary per US Army Corps and/or San Juan County specifications. Scope could include other tasks, TBD only as approved by client.

December 22, 2021

– ATTACHMENT A –
GRAYROCK VILLAGE NORTH
DMR 404 PERMIT TASKS
(See project limits/study area attached)

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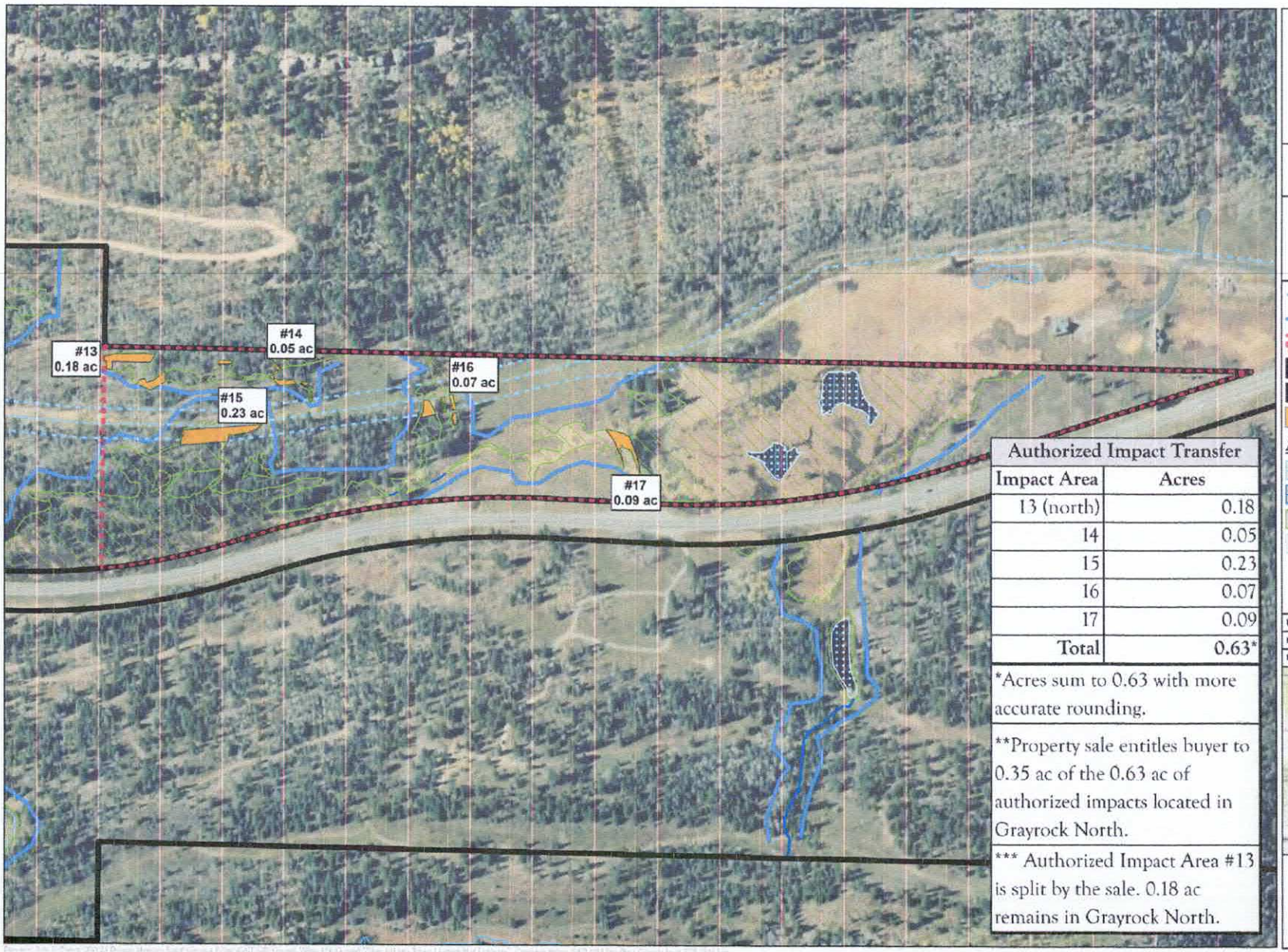

Authorized Impact Transfer	
Impact Area	Acres
13 (north)	0.18
14	0.05
15	0.23
16	0.07
17	0.09
Total	0.63*

*Acres sum to 0.63 with more accurate rounding.

**Property sale entitles buyer to 0.35 ac of the 0.63 ac of authorized impacts located in Grayrock North.

*** Authorized Impact Area #13 is split by the sale. 0.18 ac remains in Grayrock North.

SME
ENVIRONMENTAL CONSULTANTS
679 East 2nd Ave. Unit E2, Durango, Colorado 81301
www.sme-env.com (970) 259-9595

CONCEPTUAL AUTHORIZED IMPACTS TRANSFER MAP
GRAYROCK VILLAGE
NORTH PARCEL
LA PLATA COUNTY, COLORADO

- Aqueduct
- Buffer
- Project Area
- DMR Boundary
- Village Boundary
- Authorized Impacts

Aquatic Resources

- Open Water
- Other Water
- PEM
- PUAB

Drawn by:	KB	Date drawn:	11/18/2021
Rvwd. by:	SZ	Date rvwd:	
Proj. No.:	21031	Scale:	1:3,767

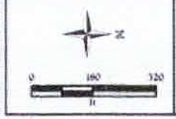

FIGURE
1