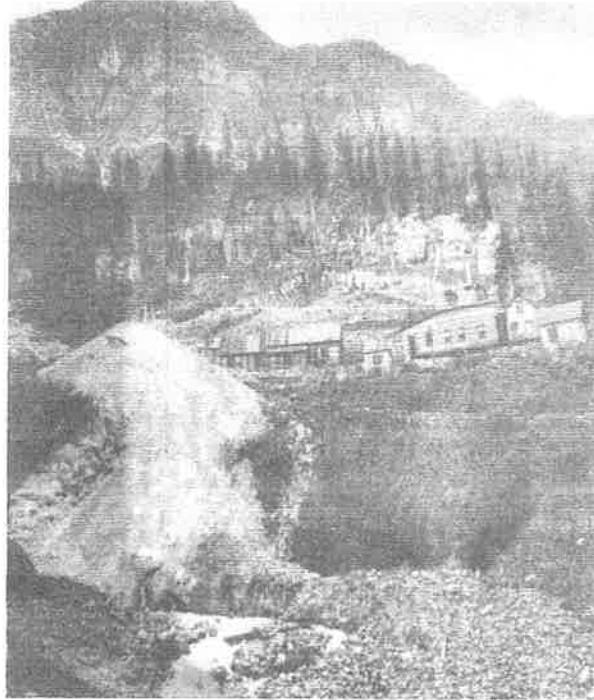


**SUPPLEMENTAL INFORMATION  
Preliminary Plan**

**PROPOSED SILVER CLOUD LODGE/PUD**

**Shelbyville Lode USMS No. 18168 et al  
Mill Creek Road and Chattanooga  
Highway 550, near Silverton  
San Juan County, Colorado**



**Applicant:**

Bonanza Boy LLC  
Attn: Mr. Colby Barrett  
PO Box 992  
Montrose, Colorado 81402  
(303) 909-6083

**Prepared By:**

Engineer Mountain, Inc.  
Attn: Lisa Adair PE  
962 Reese Street  
PO Box 526  
Silverton, Colorado 81433  
(970) 387-0500  
Job No. 2023-101

**Submitted:**

August 9, 2024



\*SOILS \*RETAINING WALLS  
\*SEPTICS \*FOUNDATIONS  
\*GRADING AND DRAINAGE  
\*SITE DEVELOPMENT

August 9, 2024

San Juan County  
Attn: Willy Tookey  
1557 Greene Street  
Silverton, Colorado 81433

EMI Job No. 2023-101

Subject: Supplemental Information, Preliminary Plan Application for a Proposed Planned Unit Development (PUD), **Proposed Silver Cloud Lodge/PUD**, Shelbyville Lode USMS No. 18168 et al, Mill Creek, near Chattanooga, Highway 550, San Juan County, Colorado.

Dear Willy and Commissioners:

This submittal has been prepared to provide you with supplemental information regarding the Proposed Silver Cloud Lodge/PUD.

The supplemental information included in this booklet was requested by the Board of County Commissioners at their July 10 meeting.

The Applicant/Owner is Colby Barrett of Bonanza Boy LLC.

The Proposed Silver Cloud Lodge/PUD is located on Mill Creek Road (County Road 15/US Forest Service Road 821) near Chattanooga on Highway 550 in San Juan County, Colorado.

The Proposed Silver Cloud Lodge/PUD is intended as a mining heritage tourism and outdoor recreation facility.

The future proposed PUD improvements consist of the following: proposed Silver Cloud Lodge structure, a garage/employee housing structure, accessory structures/uses, utilities, camping, and recreational/environmental improvements.

The Applicant is requesting a Board of County Commissioners pre-scheduled site visit and a "continued" Public Hearing on Wednesday, August 14, 2024.

Please contact Engineer Mountain, Inc. if you have any questions.

Sincerely,

Lisa M. Adair, PE  
Engineer Mountain, Inc.

Submittal to Willy Tookey at the County Courthouse:  
5 booklets for County Administrator, Board of County Commissioners, and Public.

Cc (Electronic Copies): Colby Barrett, Willy Tookey, Bevan Harris, and Project Consultants.

Engineer Mountain Inc. - Silverton CO - landline (970) 387-0500 - cell (970) 946-2217 - engineermountaininc@gmail.com

**SUPPLEMENTAL INFORMATION**  
**Preliminary Plan**

**PROPOSED SILVER CLOUD LODGE/PUD**

**Shelbyville Lode USMS No. 18168 et al**  
**Mill Creek Road and Chattanooga**  
**Highway 550, near Silverton**  
**San Juan County, Colorado**  
**Engineer Mountain, Inc.**

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  - a. Site Plan for Site Layout Option A
  - b. Site Layout Option A Impact on Wetlands
  - c. Views of Site Layout Option A from Highway 550
  
2. Site Layout Option B (August 2024)
  - a. Site Plan for Site Layout Option B
  - b. Site Layout Option B Impact on Wetlands
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3. Site Layout Option C (August 2024)
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  - b. Site Layout Option C Impact on Wetlands
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  - d. Plan Sheet Depicting Areas Limited by the CDOT Avalanche Howitzer

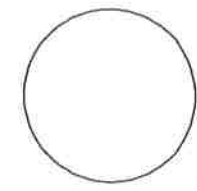
**B. CORRESPONDENCE AND ADDITIONAL DOCUMENTS**

1. Correspondence to/from Division of Natural Resources (Regarding Wildlife)
  
2. Correspondence to/from CDOT (Regarding Parking Availability on CDOT Land)
  
3. Correspondence to/from USFS (Regarding Parking Availability on USFS Land)
  
4. Notes from Meetings with Local Agencies
  - a. Gilbert Archuleta, Fire Chief of Silverton San Juan Volunteer Fire Department
  - b. Tyler George, Director of Silverton Medical Rescue (Ambulance/EMS/Search & Rescue)
  - c. San Juan County Colorado Sheriff Bruce Conrad and Building Inspector Bevan Harris
  
5. Avalanche Safety Plan Updates
  - a. Peer Review Letter by Rebecca Hodgetts (CAIC) of the Avalanche Safety Plan
  - b. Email, Updated Cover, and Updated Pages of the Avalanche Safety Plan





**Tommy Hein**  
ARCHITECTS  
Box 3327, 108 S. Oak St., Parhousa  
Telluride, Colorado 81435  
970.728.1250 www.TommyHein.com



**SUBMISSIONS**  
DATE SUBMISSION  
05.02.2023 PROJECT CONCEPT  
09.20.2023 DEVELOPMENT PERMIT  
11.27.2023 OWNER MEETING  
12.15.2023 PRELIM. PUD COORDINATION

**PROGRESS**  
12.20.2023

**Bonanza Boy**

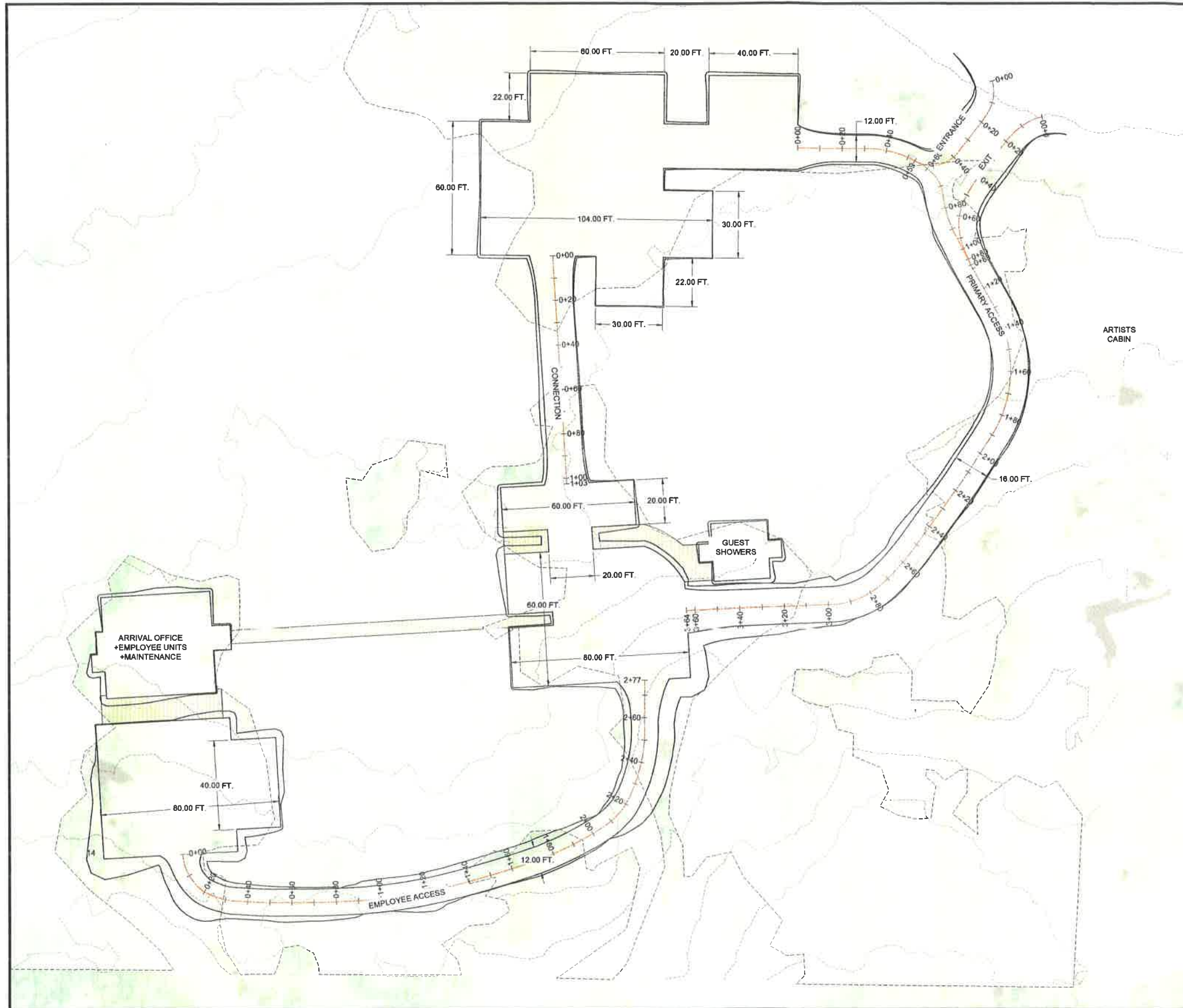
SILVER CLOUD  
PUD  
SAN JUAN  
COUNTY  
COLORADO

**SITE  
DEVELOPMENT  
PLAN**

**A  
3.1**

**1 SITE PLAN**  
SCALE: 1" = 30'-0"



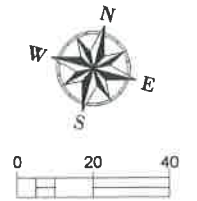


**LEGEND**

- EXISTING CONTOURS (1 FOOT INTERVAL)
- PROPOSED CONTOURS (1 FOOT INTERVAL)
- EXISTING WETLAND AREA

**CONSTRUCTION NOTES**

- A. CONTRACTOR SHALL VERIFY ALL DIMENSIONS BEFORE STARTING WORK AND SHALL IMMEDIATELY NOTIFY THE OWNER OF ANY DISCREPANCIES



Engineer's Certification

*Brian Keith Briggs, being a Registered Professional Engineer in the State of Colorado, do hereby certify that this drawing has been completed by me or under my direct supervision and that it is true and correct to the best of my knowledge and belief.*



403 N 1st STREET  
 Montrose, CO 81401  
 (970) 596-1982  
 bbriggs@bkbassoc.com

DATE	REVISION

**Bonanza Boy  
 Hardscape Plan**

Drawing No.: C301

DATE: 05-12-2024    DRAWN BY: DAM  
 SCALE: SEE BAR    APPROVED BY: BKB  
 FILE: Fig C301 Bonanza Boy Hardscape Plan.dwg





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SUBMISSIONS	
DATE	SUBMISSION
12.15.2023	PRELIM. PUD

**BONANZA BO  
 VISUAL IMPACT  
 FROM HWY. 550**

**VIEW #1 FROM NORTH BOUND LANE AT CLEARING IN TREES FROM UPPER HWY 550**

**LEGEND:**

- EXISTING ARTIST'S CABIN LOCATION
- PROPOSED MAIN BUILDING
- PROPOSED SHOWER BUILDING

**IMAGERY GENERAL NOTES**

THE PROVIDED IMAGERY WAS GATHERED FROM GOOGLE STREETVIEW FROM THE NORTH-BOUND LANE. THE IMAGERY IS ALIGNED TO SURVEYOR'S 3D POINT CLOUD FROM AN AERIAL DRONE SCAN AND THE 3D ARCHITECTURAL CONCEPT MODEL



**VICINITY MAP AND CAMERA LOCATION**

**VIEW #1**





**VIEW #2 NORTH-BOUND LANE LOOKING SOUTHEAST ON HWY 550**

**LEGEND:**

- EXISTING ARTIST'S CABIN LOCATION
- PROPOSED MAIN BUILDING
- PROPOSED SHOWER BUILDING

**IMAGERY GENERAL NOTES**

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**VICINITY MAP AND CAMERA LOCATION**

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SUBMISSIONS	
DATE	SUBMISSION
12.15.2023	PRELIM. PUD

**BONANZA BO  
 VISUAL IMPACT  
 FROM HWY. 550**

**VIEW #2**

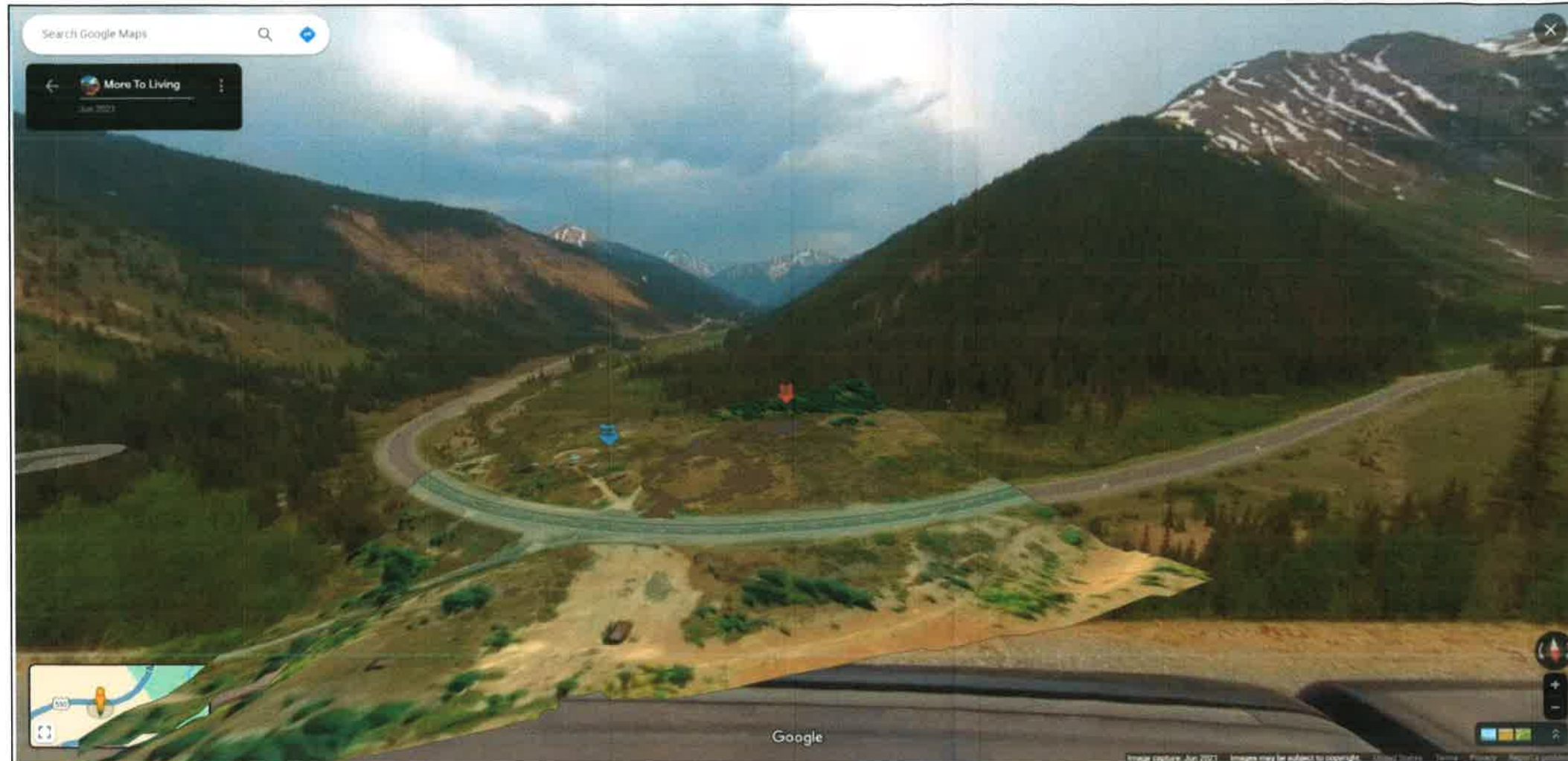












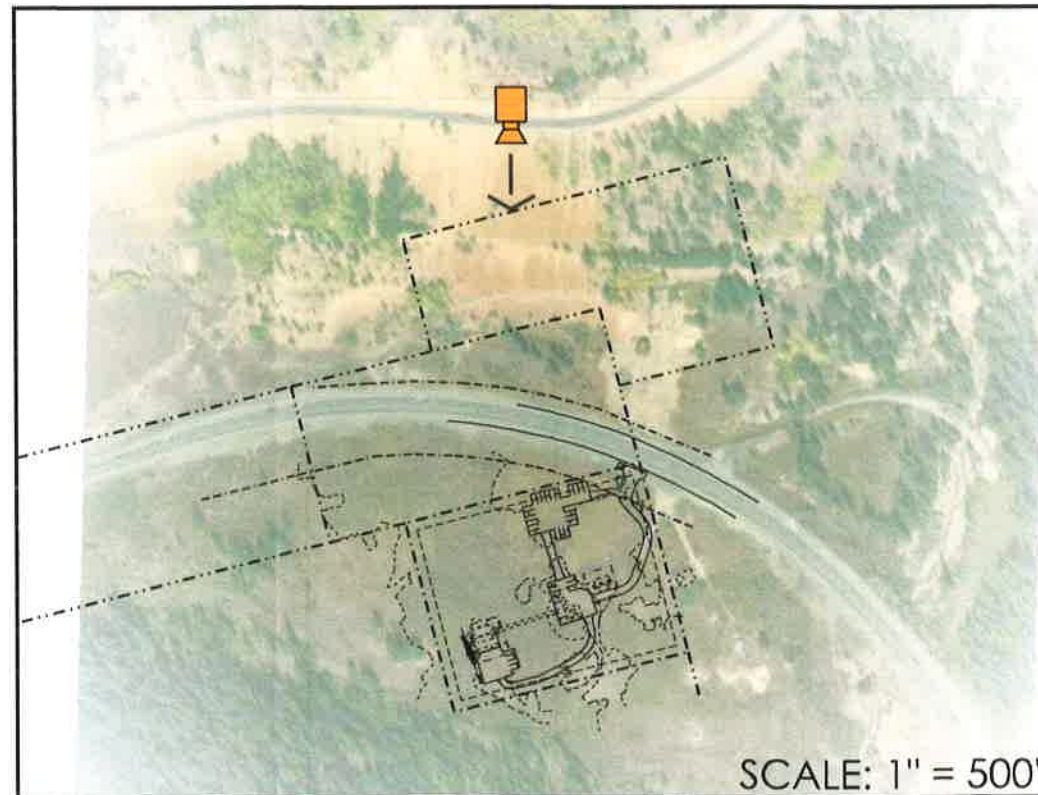
**VIEW #1 FROM NORTH BOUND LANE AT CLEARING IN TREES FROM UPPER HWY 550**

**LEGEND:**

- EXISTING ARTIST'S CABIN LOCATION
- PROPOSED MAIN BUILDING

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SCALE: 1" = 500'

**VICINITY MAP AND CAMERA LOCATION**

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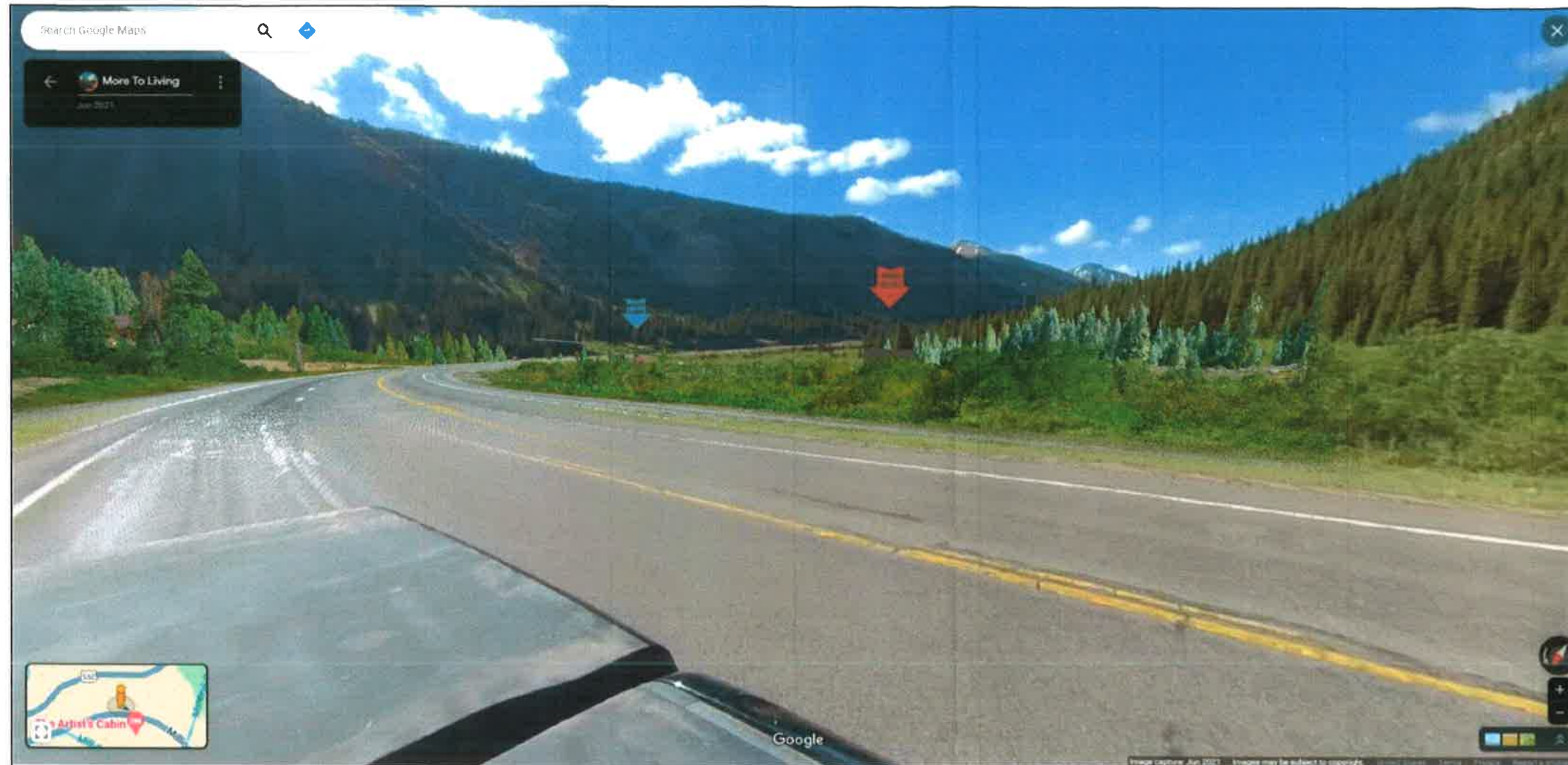
**SUBMISSIONS**

DATE	SUBMISSION
12.15.2023	PRELIM. PUD
08.09.2024	OPTION B

**BONANZA BOY - OPT. B**  
**VISUAL IMPACT**  
**FROM HWY. 550**

**VIEW #1**





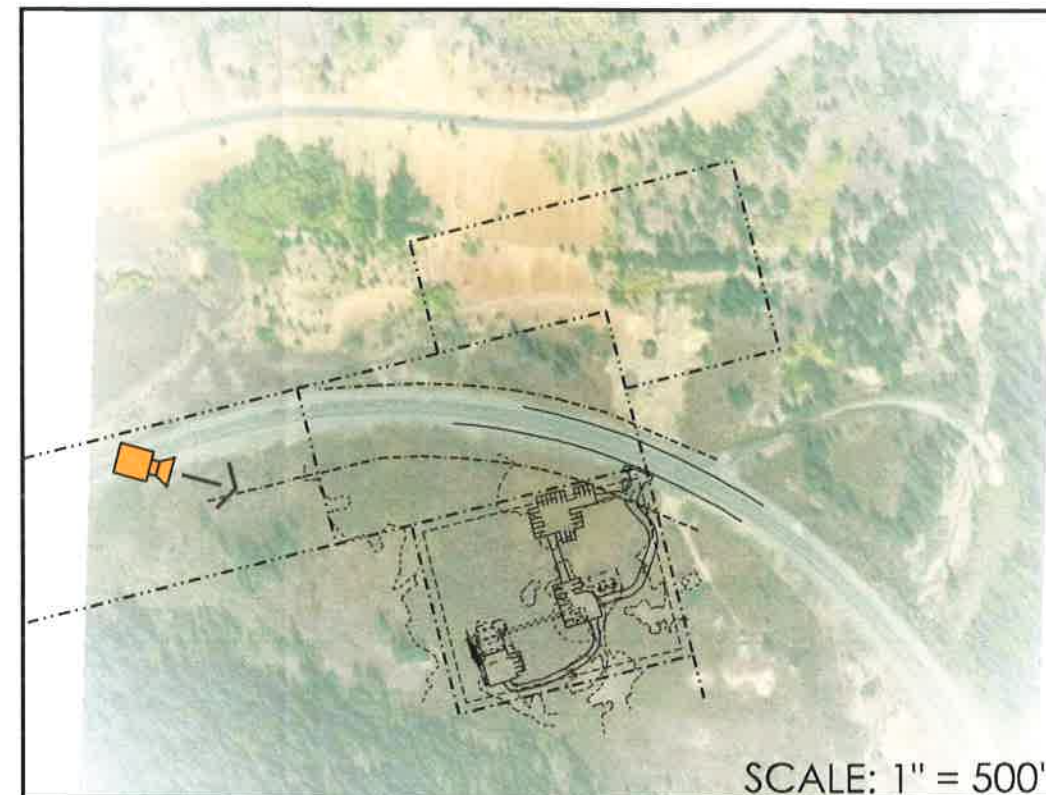
**VIEW #2 NORTH-BOUND LANE LOOKING SOUTHEAST ON HWY 550**

**LEGEND:**

- EXISTING ARTIST'S CABIN LOCATION
- PROPOSED MAIN BUILDING

**IMAGERY GENERAL NOTES**

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**VICINITY MAP AND CAMERA LOCATION**

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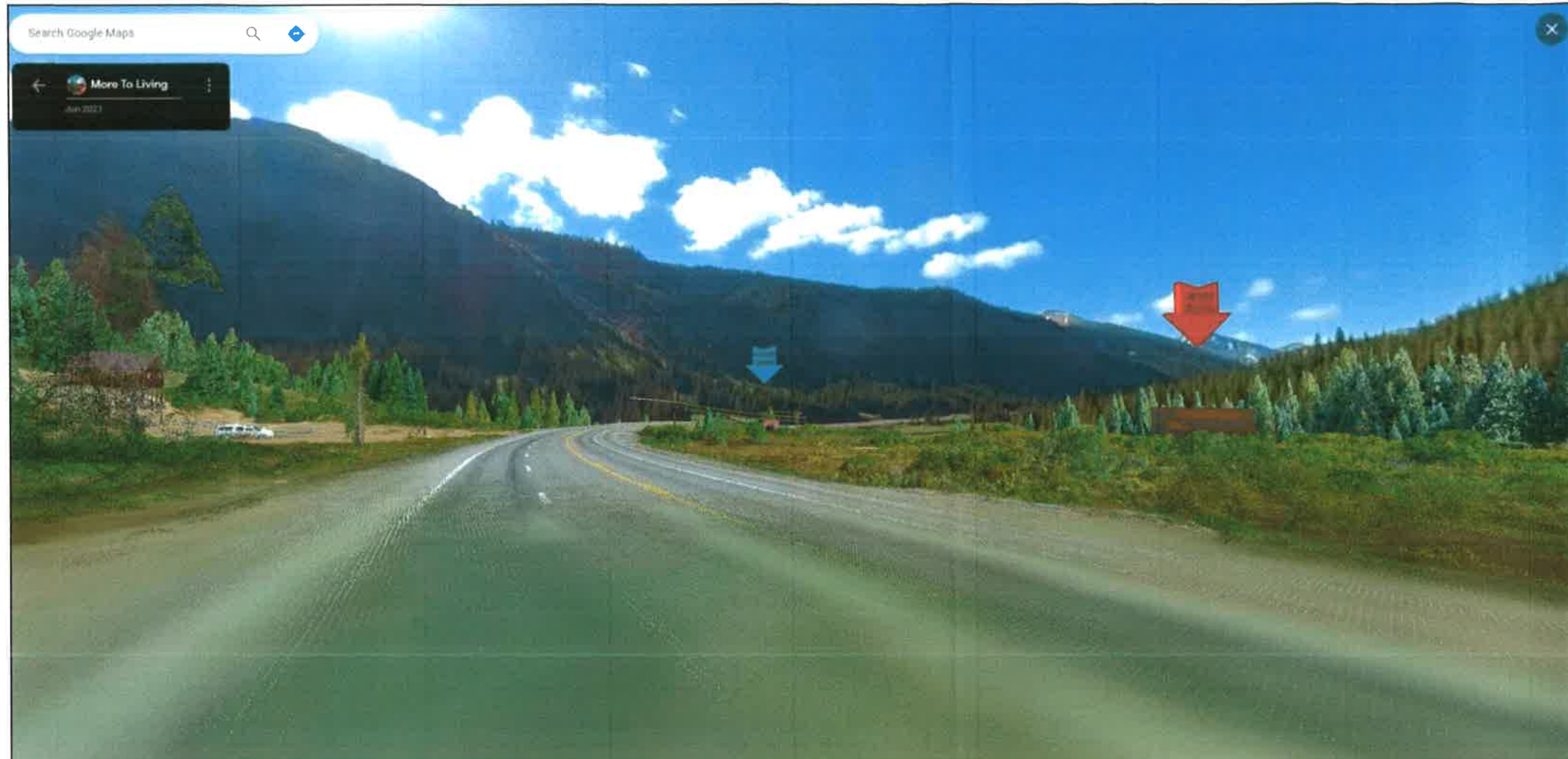
**SUBMISSIONS**

DATE	SUBMISSION
12.15.2023	PRELIM. PUD
08.09.2024	OPTION B

**BONANZA BOY - OPT. B  
 VISUAL IMPACT  
 FROM HWY. 550**

**VIEW #2**





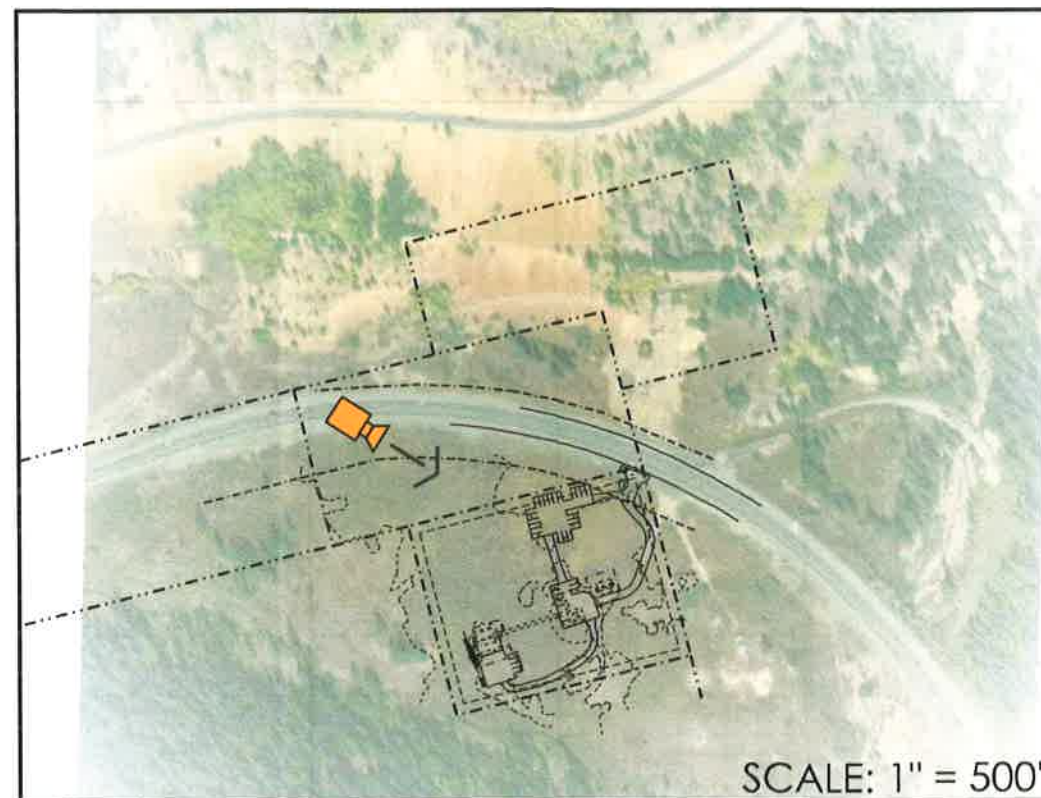
**VIEW #3 NORTH-BOUND LANE LOOKING SOUTHEAST ON HWY 550**

**LEGEND:**

- EXISTING ARTIST'S CABIN LOCATION
- PROPOSED MAIN BUILDING

**IMAGERY GENERAL NOTES**

THE PROVIDED IMAGERY WAS GATHERED FROM GOOGLE STREETVIEW FROM THE NORTH-BOUND LANE. THE IMAGERY IS ALIGNED TO SURVEYOR'S 3D POINT CLOUD FROM AN AERIAL DRONE SCAN AND THE 3D ARCHITECTURAL CONCEPT MODEL



**VICINITY MAP AND CAMERA LOCATION**

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**SUBMISSIONS**

DATE	SUBMISSION
12.15.2023	PRELIM. PUD
08.09.2024	OPTION B

**BONANZA BOY - OPT. B**  
**VISUAL IMPACT**  
**FROM HWY. 550**

**VIEW #3**





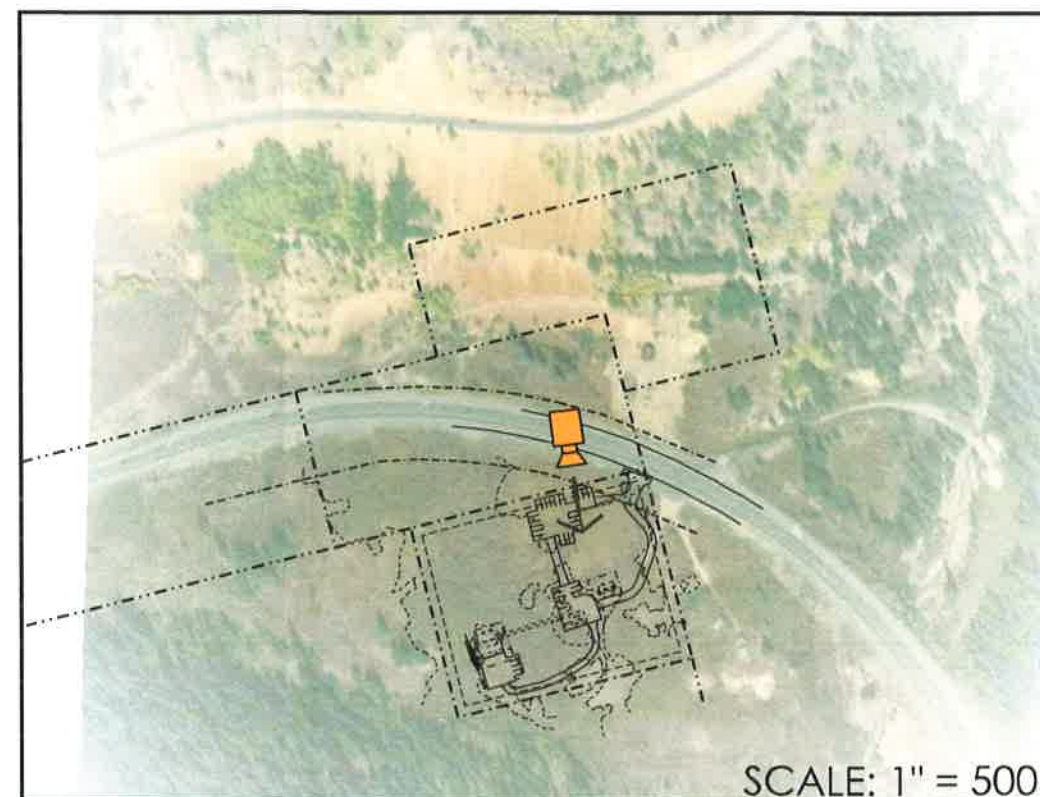
**VIEW #4 NORTH-BOUND LANE LOOKING SOUTH ON HWY 550**

**LEGEND:**

- EXISTING ARTIST'S CABIN LOCATION
- PROPOSED MAIN BUILDING

**IMAGERY GENERAL NOTES**

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SCALE: 1" = 500'

**VICINITY MAP AND CAMERA LOCATION**

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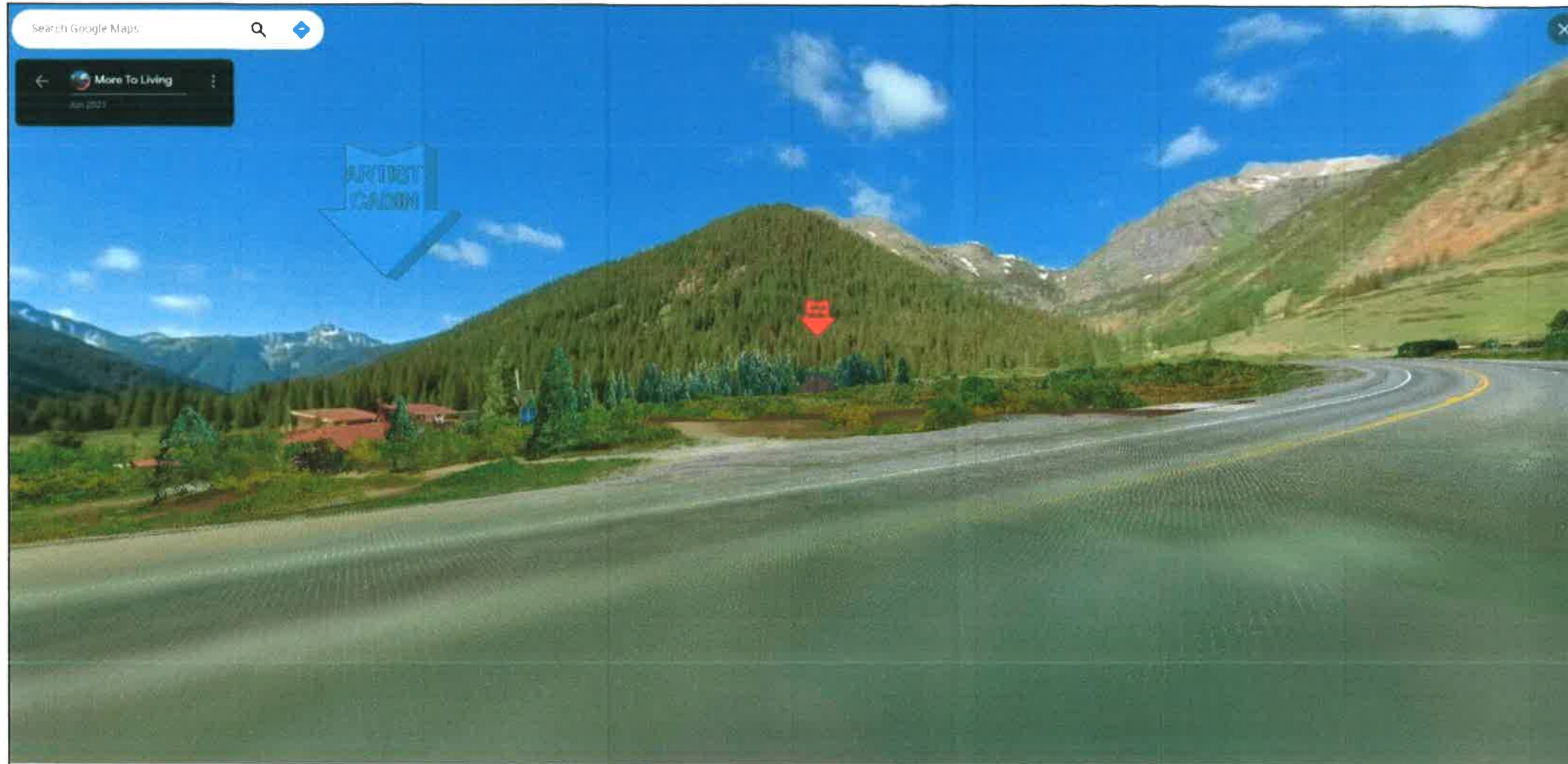
**SUBMISSIONS**

DATE	SUBMISSION
12.15.2023	PRELIM. PUD
08.09.2024	OPTION B

**BONANZA BOY - OPT. B**  
**VISUAL IMPACT**  
**FROM HWY. 550**

**VIEW #4**





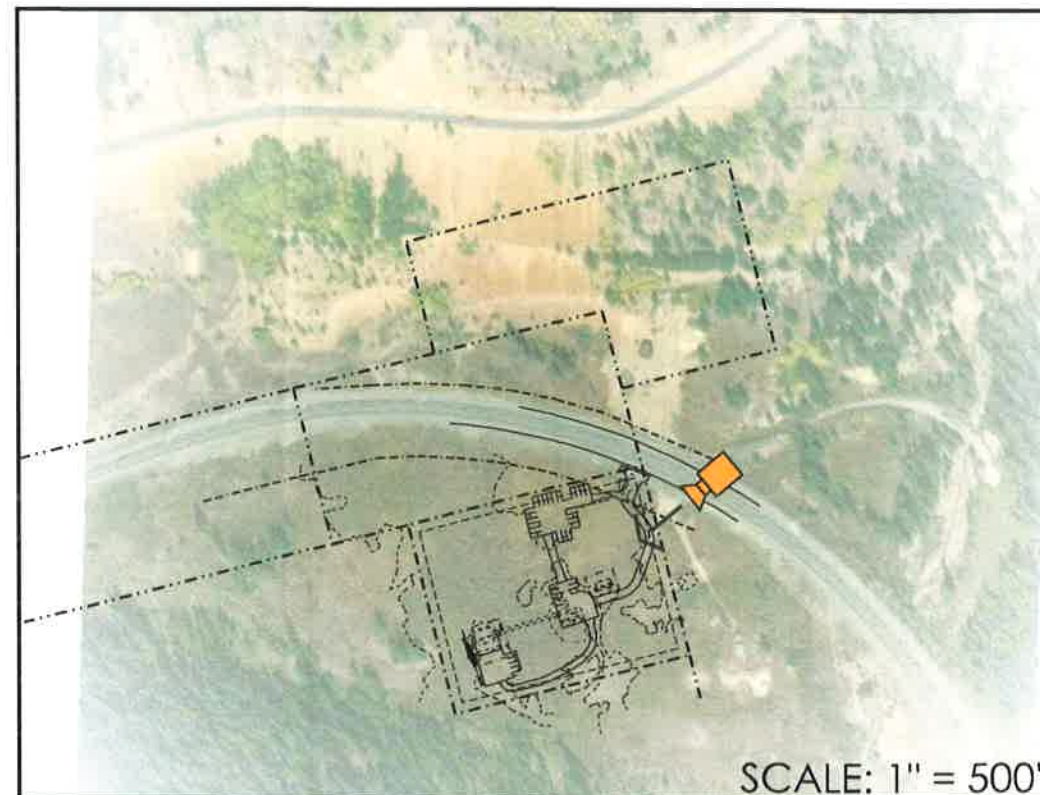
**VIEW #5 NORTH-BOUND LANE LOOKING SOUTHWEST ON HWY 550**

**LEGEND:**

- EXISTING ARTIST'S CABIN LOCATION
- PROPOSED MAIN BUILDING

**IMAGERY GENERAL NOTES**

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**VICINITY MAP AND CAMERA LOCATION**

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**SUBMISSIONS**

DATE	SUBMISSION
12.15.2023	PRELIM. PUD
08.09.2024	OPTION B

**BONANZA BOY - OPT. B  
 VISUAL IMPACT  
 FROM HWY. 550**

**VIEW #5**





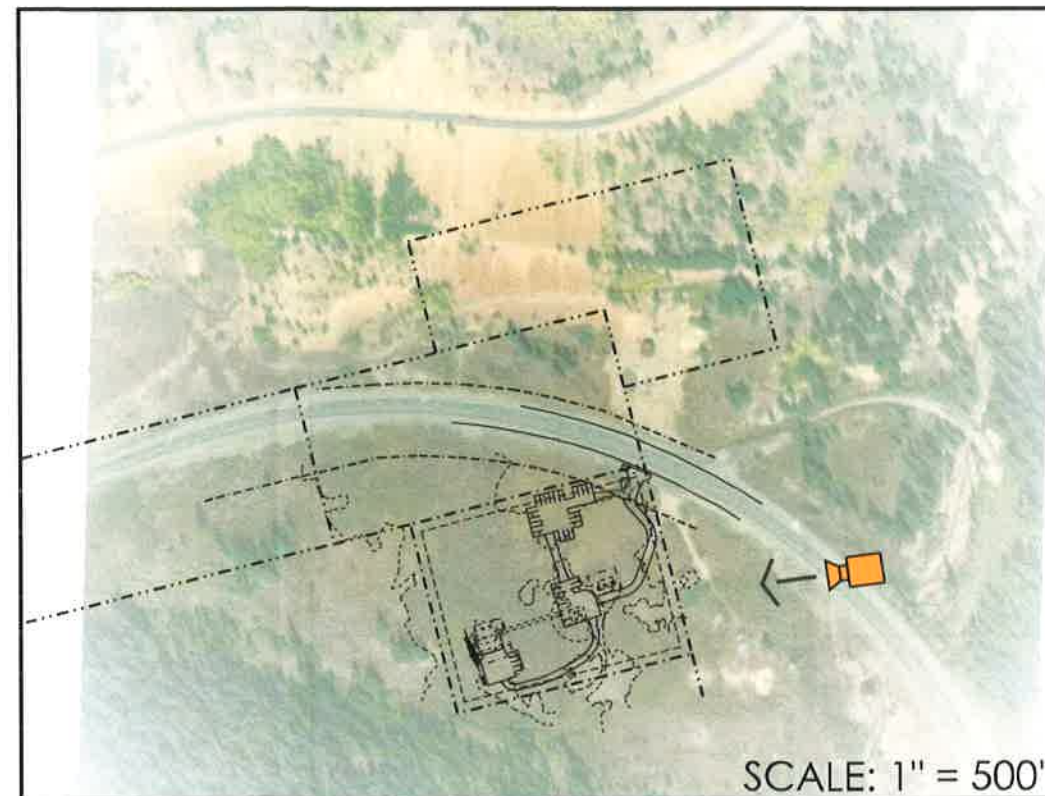
**VIEW #6 NORTH-BOUND LANE LOOKING WEST ON HWY 550**

**LEGEND:**

- EXISTING ARTIST'S CABIN LOCATION
- PROPOSED MAIN BUILDING

**IMAGERY GENERAL NOTES**

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SCALE: 1" = 500'

**VICINITY MAP AND CAMERA LOCATION**

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**SUBMISSIONS**

DATE	SUBMISSION
12.15.2023	PRELIM. PUD
08.09.2024	OPTION B

**BONANZA BOY - OPT. B  
 VISUAL IMPACT  
 FROM HWY. 550**

**VIEW #6**

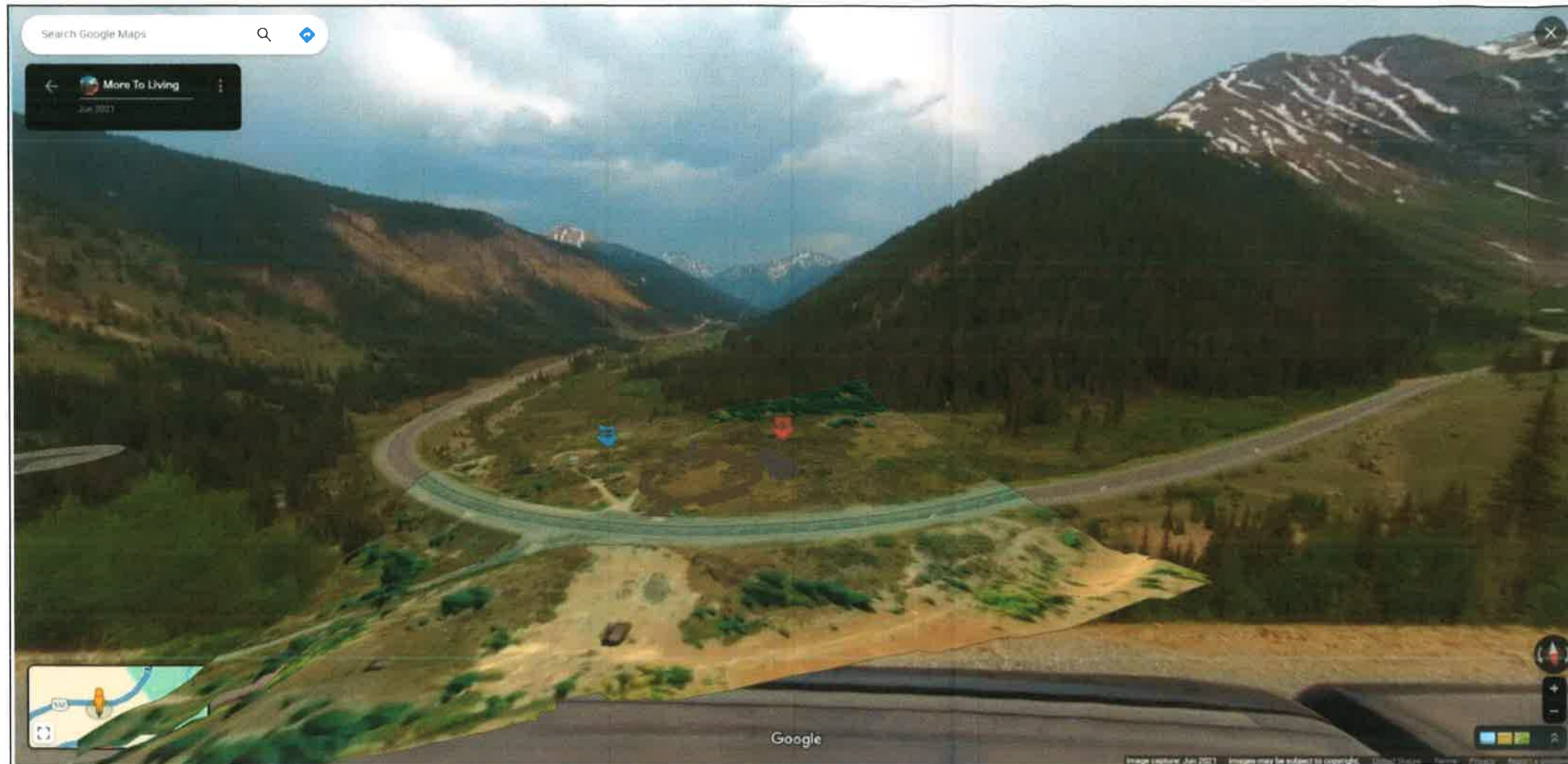












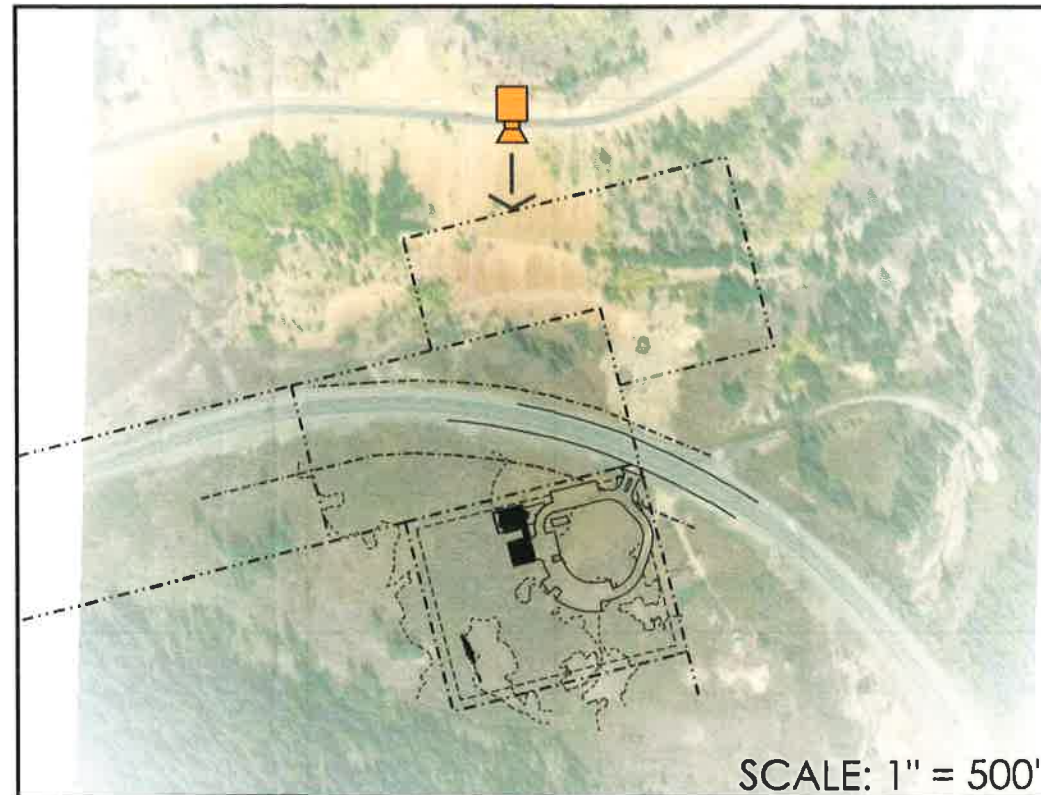
**VIEW #1 FROM NORTH BOUND LANE AT CLEARING IN TREES FROM UPPER HWY 550**

**LEGEND:**

- EXISTING ARTIST'S CABIN LOCATION
- PROPOSED MAIN BUILDING

**IMAGERY GENERAL NOTES**

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**VICINITY MAP AND CAMERA LOCATION**

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**SUBMISSIONS**

DATE	SUBMISSION
12.15.2023	PRELIM. PUD
08.09.2024	OPTION C

**BONANZA BOY - OPT. C**  
**VISUAL IMPACT**  
**FROM HWY. 550**

**VIEW #1**





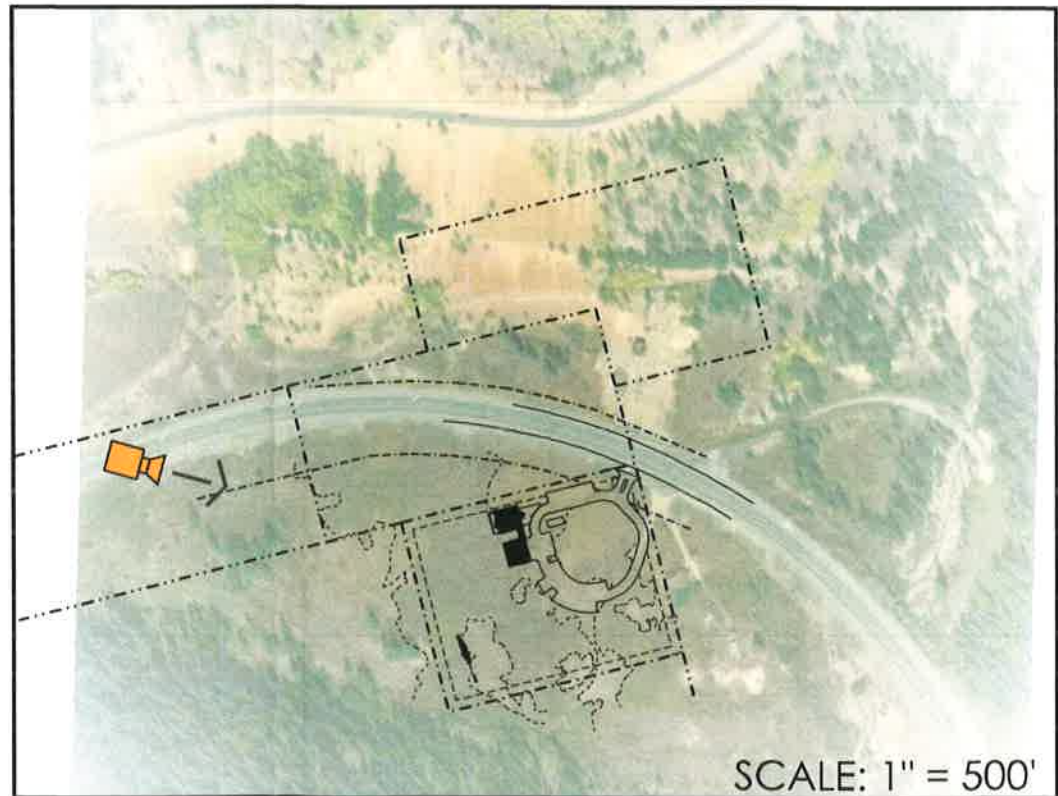
**VIEW #2 NORTH-BOUND LANE LOOKING SOUTHEAST ON HWY 550**

**LEGEND:**

- EXISTING ARTIST'S CABIN LOCATION
- PROPOSED MAIN BUILDING

**IMAGERY GENERAL NOTES**

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**VICINITY MAP AND CAMERA LOCATION**

**Tommy Hein**  
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**SUBMISSIONS**

DATE	SUBMISSION
12.15.2023	PRELIM. PUD
08.09.2024	OPTION C

**BONANZA BOY - OPT. C**  
**VISUAL IMPACT**  
**FROM HWY. 550**

**VIEW #2**





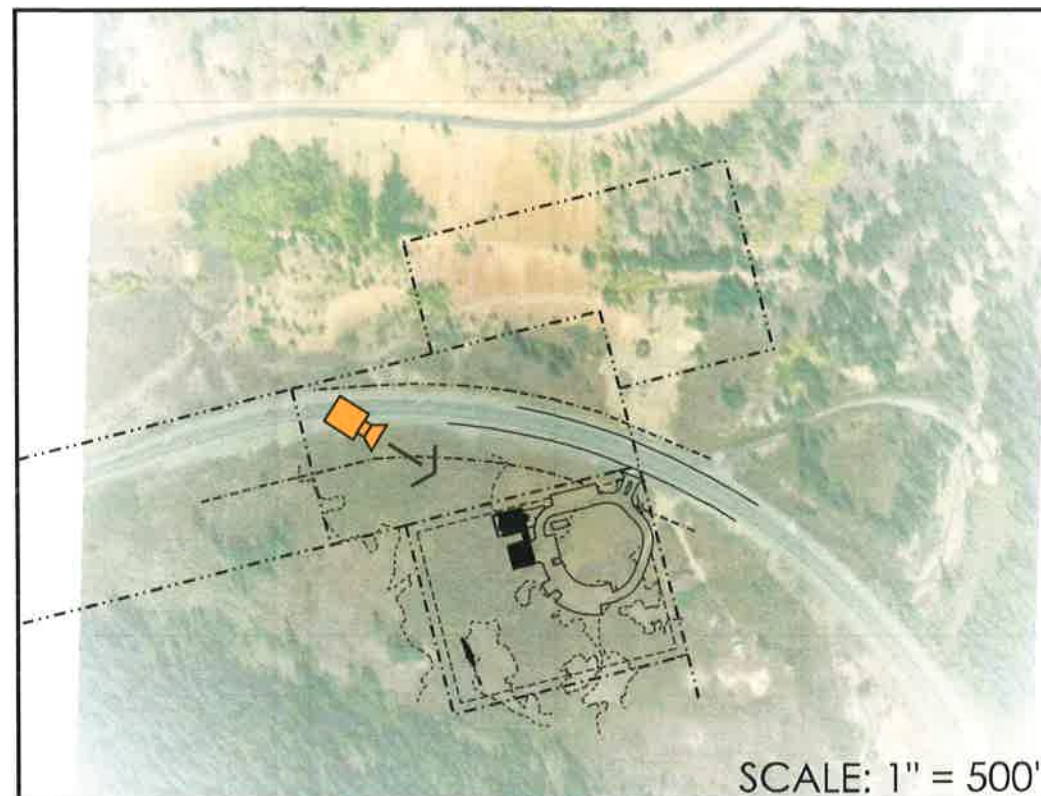
**VIEW #3 NORTH-BOUND LANE LOOKING SOUTHEAST ON HWY 550**

**LEGEND:**

- EXISTING ARTIST'S CABIN LOCATION
- PROPOSED MAIN BUILDING

**IMAGERY GENERAL NOTES**

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**VICINITY MAP AND CAMERA LOCATION**

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**SUBMISSIONS**

DATE	SUBMISSION
12.15.2023	PRELIM. PUD
08.09.2024	OPTION C

**BONANZA BOY - OPT. C**  
**VISUAL IMPACT**  
**FROM HWY. 550**

**VIEW #3**





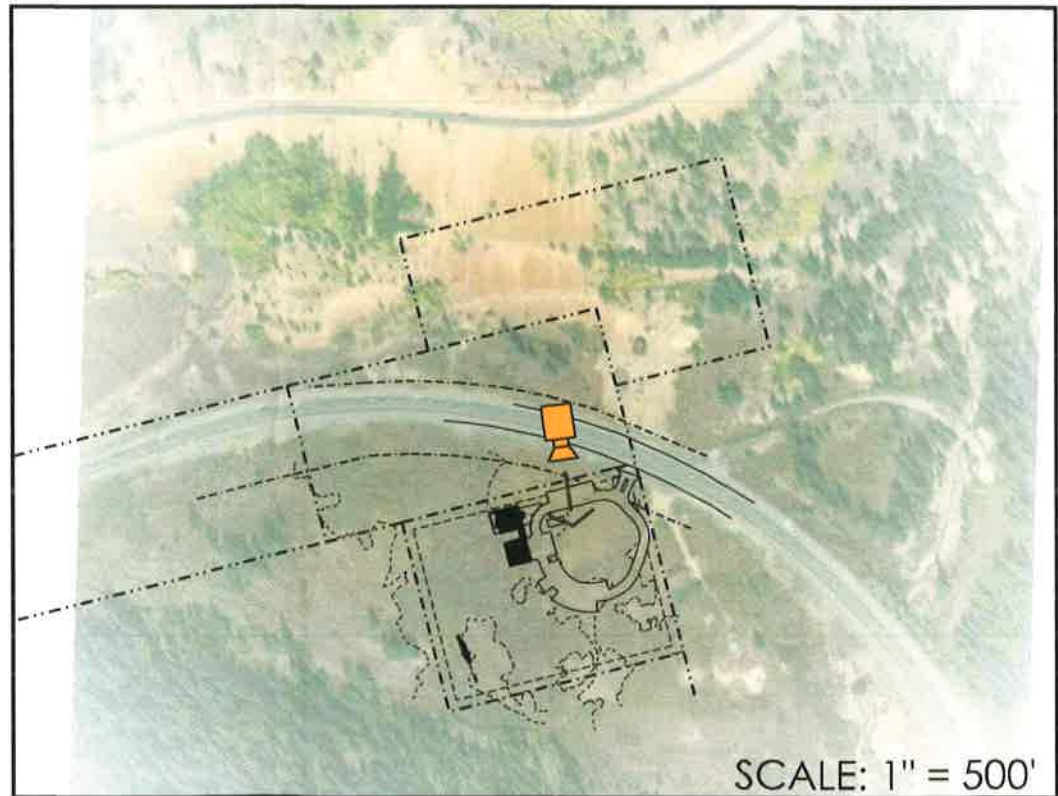
**VIEW #4 NORTH-BOUND LANE LOOKING SOUTH ON HWY 550**

**LEGEND:**

- EXISTING ARTIST'S CABIN LOCATION
- PROPOSED MAIN BUILDING

**IMAGERY GENERAL NOTES**

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SCALE: 1" = 500'

**VICINITY MAP AND CAMERA LOCATION**

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**SUBMISSIONS**

DATE	SUBMISSION
12.15.2023	PRELIM. PUD
08.09.2024	OPTION C

**BONANZA BOY - OPT. C**  
**VISUAL IMPACT**  
**FROM HWY. 550**

**VIEW #4**





**VIEW #5 NORTH-BOUND LANE LOOKING SWHVEST ON HWY 550**

**LEGEND:**

- EXISTING ARTIST'S CABIN LOCATION
- PROPOSED MAIN BUILDING

**IMAGERY GENERAL NOTES**

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**VICINITY MAP AND CAMERA LOCATION**

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**SUBMISSIONS**

DATE	SUBMISSION
12.15.2023	PRELIM. PUD
08.09.2024	OPTION C

**BONANZA BOY - OPT. C**  
**VISUAL IMPACT**  
**FROM HWY. 550**

**VIEW #5**





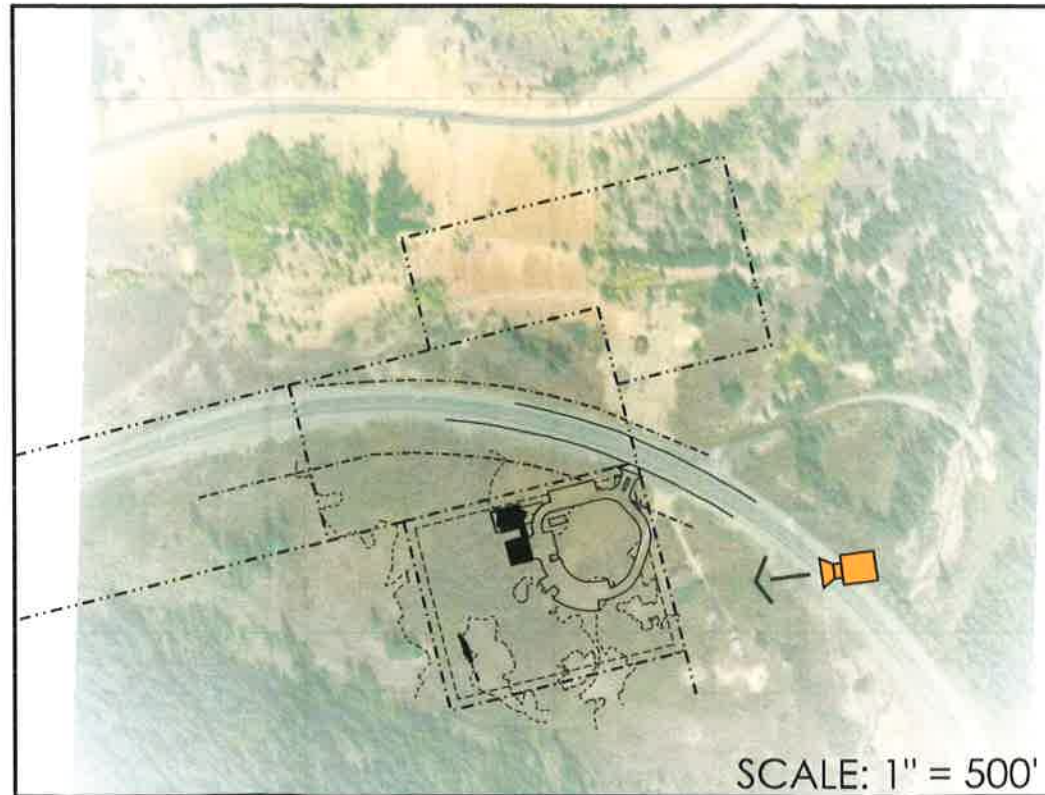
**VIEW #6 NORTH-BOUND LANE LOOKING WEST ON HWY 550**

**LEGEND:**

- EXISTING ARTIST'S CABIN LOCATION
- PROPOSED MAIN BUILDING

**IMAGERY GENERAL NOTES**

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**VICINITY MAP AND CAMERA LOCATION**

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**SUBMISSIONS**

DATE	SUBMISSION
12.15.2023	PRELIM. PUD
08.09.2024	OPTION C

**BONANZA BOY - OPT. C**  
**VISUAL IMPACT**  
**FROM HWY. 550**

**VIEW #6**



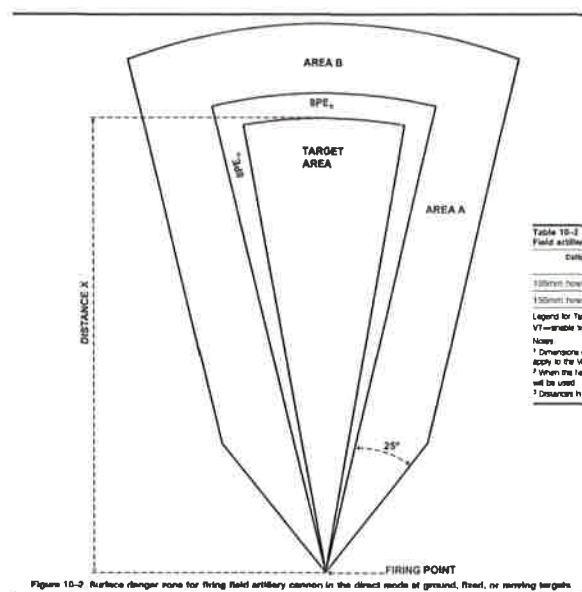


Table 10-2  
Field artillery cannon surface danger zone criteria

Caliber	Area A <sup>1</sup> (m)	Area B <sup>1</sup> (m)	Area C (see sample) <sup>2</sup> (m)	Area C Height, Base, VPI (m)	Area E (m)	Direct fire needs <sup>3</sup> (m)
155mm Howitzer	500	550	300	350	500	800
155mm Howitzer	725	775	390	150	725	790

Legend for Table 10-2  
VPI=vertical interval

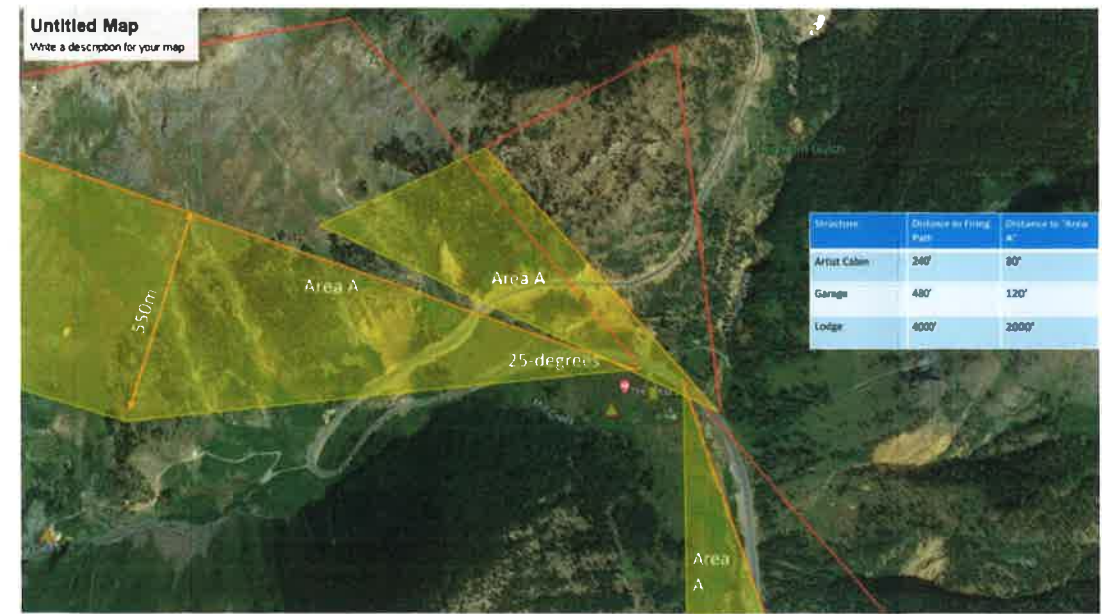
Notes:  
<sup>1</sup> Dimensions of Areas A and B may be reduced by 50 percent when firing illumination projectiles. The reduction of Areas A and B by 50 percent does not apply to the 1100x 105mm infrared illumination projectile.  
<sup>2</sup> When the headings of more than one column above relate in some way to the type of firing to be conducted, the column giving the larger value of Area C will be used.  
<sup>3</sup> Distances in this column represent minimum target engagement distances when personnel at the firing position are unprotected.

Figure 10-2 Surface danger zone for firing field artillery cannon in the direct mode at ground, fixed, or moving targets.

CDOT HOWITZER DANGER AREA CRITERIA



CDOT HOWITZER TARGET AREAS



CDOT HOWITZER DANGER AREAS

**Tommy Hein**  
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**Submissions**  
FIRST ISSUE 21.09.09

08-08-2024

Silver Cloud PUD  
San Juan County,  
Colorado

CDOT Howitzer  
Operations

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**A1.20**



**FW: Possible site visit to the Silver Cloud restoration project**

1 message

Colby Barrett <cbarrett17@gmail.com>  
To: Lisa Adair <engineermountaininc@gmail.com>

Fri, Jul 26, 2024 at 3:42 PM

**From:** Dye - DNR, Brandon <brandon.dye@state.co.us>  
**Date:** Friday, July 26, 2024 at 3:39 PM  
**To:** Colby Barrett <cbarrett17@gmail.com>  
**Subject:** Re: Possible site visit to the Silver Cloud restoration project

Looks accurate to me.

On Fri, Jul 26, 2024 at 3:36 PM Colby Barrett <cbarrett17@gmail.com> wrote:

Brandon, it was good talking with you this afternoon about our project. Below are a few notes I took – let me know if these don't seem correct or if there is anything else we should be considering as we continue to refine our project.

Main Mill Creek Valley (where the lodge and camping/stream restoration would go)

-This area is in the overall range of elk, bear, and deer but not Turkey, Pronghorn, Mountain Goat, or bighorn. There are no concentrations or major migration patterns in that part of the valley, and you don't personally see much activity in the valley save for the odd moose wandering around, which is all consistent with CPW Hunting Atlas data. But no major concerns with wildlife conflict in that area.

-Once we've completed our stream restoration, we can call you and discuss beaver reintroduction. You guys may, from time to time, have nuisance beavers that could be relocated to our newly restored stream. If these beavers don't like our newly restored stream, they also have options downstream.

Bonanza Bgy Millsite (near Artist Cabin)

-Similar notes to above, but more moose activity.

-General area is considered "developed." Next to a main highway and also inhabited buildings (Artist Cabin). So development would not be a major risk to wildlife as it could be in more remote/undisturbed areas.

-In general, when selecting building sites, the closer you can get to other development and the road the better. But between the two sites that we're proposing (which are 270-ft apart) the difference between a site closer to the road and one closer to the creek isn't significant in terms of wildlife impact, especially if there are other concerns at play (like proximity to howitzer path).

-Building should be done in a way to limit impact to any possible moose calving in the area. This means that if possible, don't build from May 15-June 15 (or perhaps even to June 30 at that elevation). But if building during this window prevents a longer overall disturbance, get the work done and get finished. For example, if you have a 6 month build and by starting on May 1 you can complete in 1 season, with an alternate option of going from July 1-October 30 of year 1 and then from July 1-August 30 of the next year, choose the 1 season option.

-Human/wildlife conflict would probably take the form of bears and moose with calves (which are very protective). Be careful with dogs around wildlife.

-Try to avoid fencing in this area, and keep outdoor lights at night to a minimum.

Thanks!

Colby



**From:** Colby Barrett <cbarrett17@gmail.com>  
**Date:** Friday, July 12, 2024 at 6:10 PM  
**To:** Constan - CDOT, Julie <julie.constan@state.co.us>  
**Cc:** Spain - CDOT, Brian <brian.spain@state.co.us>  
**Subject:** Re: Chattanooga parcels

Thanks Julie!

Sent from my Verizon, Samsung Galaxy smartphone  
Get [Outlook for Android](#)

---

**From:** Constan - CDOT, Julie <julie.constan@state.co.us>  
**Sent:** Friday, July 12, 2024 1:35:03 PM  
**To:** Colby Barrett <cbarrett17@gmail.com>  
**Cc:** Spain - CDOT, Brian <brian.spain@state.co.us>  
**Subject:** Re: Chattanooga parcels

Hi Colby,

We will need to run your request by a few of our team members. So give me a week or two, and we will let you if think we could accommodate this request.

Thank you,

Julie

On Thu, Jul 11, 2024 at 7:21 PM Colby Barrett <cbarrett17@gmail.com> wrote:

Hi Julie and Brian, I hope all is well with you both. As you might have heard, this winter we had some great discussions with your winter operations team about avalanche mitigation coordination in the Mill Creek Valley. They're an impressive outfit and we enjoyed working with them.

I'm writing today about more of a "summer" than "winter" concept. As you are probably both aware, we've been in the permitting process with San Juan County for the past year or so. Last night was our 6<sup>th</sup> meeting with the County, with all 5 before that one successfully approved. Last night the Commissioners asked for a few items that we had not yet prepared for, so we'll need to meet with them on August 14<sup>th</sup> with answers to those new requests in hand.

Specific to the CDOT, the County Commissioners asked that we inquire about the possibility of getting permission to use the small parking lot by the Ore Chute directly across 550 from our property (outside of avalanche season only) for guest parking. Red arrow points to it in the map below.

The reason for this "new" request is that the we had previously planned to put most of our parking at the lower employee housing location (green square in the map below). That location has some wetlands on it, and even though our parking plan had us filling less than 0.2 acres, the Commissioners wanted us to explore options to reduce parking at that location and look at other locations that are already cleared



and disturbed. I know the Artist Cabin owners would also like to see less activity on this parcel as well. We're also cognizant of wildlife impacts South of the highway.

The Commissioners are willing to write a letter of support for that plan if it would help.

If this is a possibility, I'm guessing that this would simply be a lease of this land from CDOT (for use outside of avalanche season only). This shouldn't require much in the way of disturbance (maybe a bit of minor grading and painting rocks to delineate parking spaces). I know you guys park a bulldozer there from time to time, and we could keep space open for that and other CDOT uses. If it would be helpful for us to fence and gate the parking area (at our cost) we would be happy to do that too, which might also discourage people trespassing onto the ore chute.

The area of the parking would be about 0.53 acres, as per the schematic below:



Let me know if this is a possibility, if you want to discuss by phone, or if there are any additional details I can send you.

Thanks,

Colby



**Summer Parking Idea**

1 message

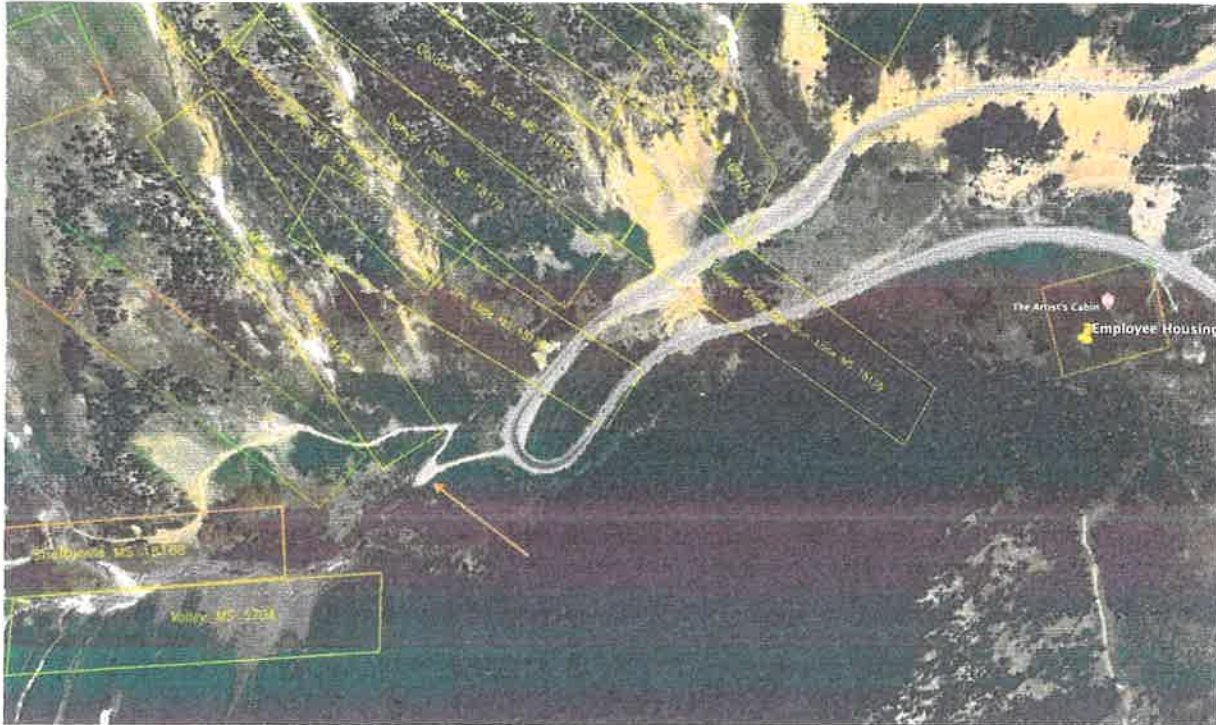
Colby Barrett &lt;cbarrett17@gmail.com&gt;

To: "Christenson, Erin - FS, CO" &lt;Erin.Christenson@usda.gov&gt;

Thu, Jul 11, 2024 at 7:02 PM

Erin, I met with the County Commissioners yesterday about our PUD application. This is our 6<sup>th</sup> meeting with the County, with all 5 before this one successful. Last night the Commissioners asked for a few items that we had not yet prepared for, so we'll need to meet with them on August 14<sup>th</sup> with answers to those new requests in hand.

Specific to the USFS, the County Commissioners asked that we inquire about the possibility of getting permission to use the small parking lot at the base of FSR 821 (outside of avalanche season only) for guest parking. Red arrow points to it in the map below.

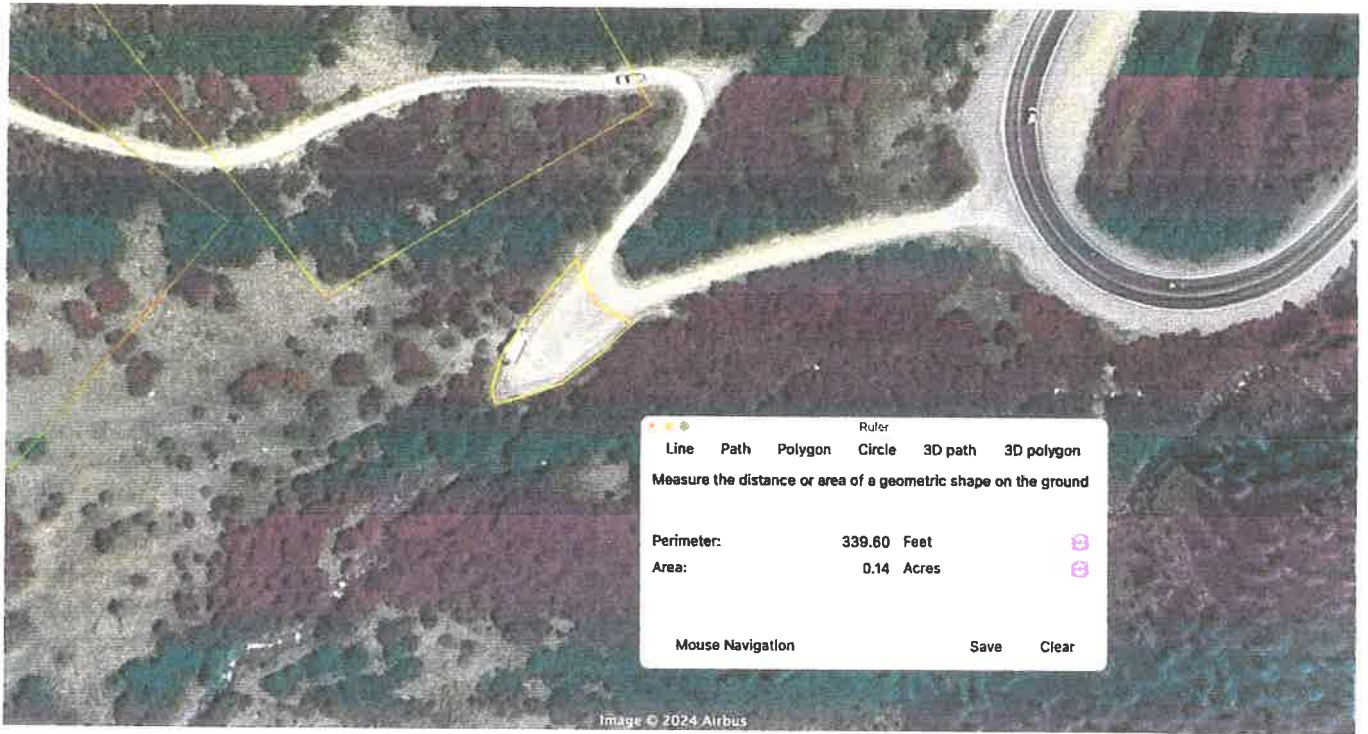


The reason for this "new" request is that we had previously planned to put most of our parking at the lower employee housing location (green square in the map below). That location has some wetlands on it, and even though our parking plan had us filling less than 0.2 acres, the Commissioners wanted us to explore options to reduce parking at that location and look at other locations that are already cleared and disturbed.

The Commissioners are willing to write a letter of support for that plan if it would help.

If this is a possibility, I'm guessing that this would simply be an addition to our existing special use permit for FSR 821. This shouldn't require much in the way of disturbance (maybe painting some rocks to delineate parking spaces). The historical inventory has already been done for the entire road from the lodge down to 550, so no additional work there. The area of the parking would be about 0.14 acres, as per the schematic below:





Let me know if this is a possibility, if you want to discuss by phone, or if there is any additional details I can send you.

Apologies for the additional request. I know when we met first you told me to ask for everything all at once instead of piecemealing things out, and I've tried to do that. But this request from the County is new, and not something I had anticipated.

Thanks,

Colby



**Proposed Silver Cloud Lodge/PUD, near Highway 550 at Chattanooga, San Juan County, CO.**

**Notes Prepared by LMA from July 30, 2024 Meeting with SILVERTON SAN JUAN VOLUNTEER FIRE DEPARTMENT.**

Location: Fire Station in Silverton CO.

Present: Fire Chief Gilbert Archuleta, Fire Department Staff Jerry Chambers and Clark Damron, Project Applicant Colby Barrett, Project Consultant Lisa Adair.

Gilbert Archuleta (GA) has an abbreviated Preliminary Plan application binder and full set of plans. GA asked about the water source and storage (water availability/capacity for fire-fighting).

We discussed an overview of the proposed improvements, the proposed buildings, the proposed underground improvements, and the proposed summer-only camping.

We discussed that the proposed improvements are going to be "fully sprinkled."

GA recommended carbon monoxide detectors, and he noted there was a (fire department emergency) call about that (carbon monoxide) last year on Red Mountain Pass.

GA recommended PPE and training for the (proposed on-site future lodge/backcountry) staff and a fire safety class.

GA suggested considering portable carbon monoxide detectors, with logs (written record) kept on the battery changes, as well as an evacuation plan if there's a carbon monoxide incident.

It was discussed that the Fire Department plans to take (one or more) fire truck(s) up to the (proposed lodge) site to try out Mill Creek Road.

There is a (temporary construction) gate (related to the Voluntary Clean Up VCUP construction at the existing mine/proposed lodge site in Mill Creek).

The three Fire Department staff persons present at the meeting were given the code number for the gate, which was written down for GA.

GA and Clark Damron (CD) asked about being able to tie into the sprinklers, and discussed "dry" sprinkler systems.

It was discussed that the campground will have a dugout (underground utility structure) with a fire hose system.

An annual training and site check was discussed.

Fire extinguishers were discussed.

Providing a "bladder bag" full of water for each camp fire was discussed.

It was discussed that the large project application is posted on the San Juan County website.

On-site capacity of water storage is currently being designed; the 30 gallons per minute existing mine adit flow rate was discussed, along with the on-site pond storage volume, and underground water storage.

The underground fire plan email and the wildfire mitigation plan in the binder were briefly discussed.

It was discussed that proposed propane tanks are included in the plans for this project.

It was discussed that this is the Preliminary Plan stage and that the next step is Final Plan.

The persons present discussed continuing to work together on this project, towards a goal that this development should be maximizing self-sufficiency in regards to on-site fire-fighting capability.

This document was prepared using the notes handwritten by LMA during the meeting 5:30 PM to 6:40 PM on July 30, 2024.



**Proposed Silver Cloud Lodge/PUD, near Highway 550 at Chattanooga, San Juan County, CO.**

**Abbreviated Notes from July 30, 2024 Meeting with SILVERTON MEDICAL RESCUE (Ambulance, EMS, Search & Rescue).**

Location: Carriage House in Silverton CO.

Present: Silverton Medical Rescue Director Tyler George, Project Applicant Colby Barrett, Project Consultant Lisa Adair.

Tyler George (TG) was shown where to locate the latest application for the project, posted online on the San Juan County Colorado website. He had already received a link to that and had reviewed it in part.

TG was shown the printed copies of the draft Emergency Operations Plan, and the April 2024 Avalanche Safety Plan, which we brought to the meeting.

TG noted that he has concerns about avalanches, ingress, and egress, and he reminded Colby Barrett (CB) and LA that there is no guarantee of emergency services, and that TG might need to have avalanche hazards mitigated before Search & Rescue (SAR)/Ambulance/EMS will enter the site.

CB mentioned that the plan is that the use of the site/structures would be shut down if hazards were too high or Highway is going to close due to avalanches (if hazard/closure is known in advance, as opposed to a plan to just continue occupying the site and sheltering in place).

CB and TG discussed the self-sufficiency measures planned for the site.

CB is expecting an estimated 6-12 Helitrax trips per year, and guest site occupancy was discussed.

CB and TG discussed the expected types/qualifications of on-site staff, and that the site will be "guided-only" in the winter, with guiding for some activities in the summer.

TG and CB discussed that the project needs to be envisioned as if Search and Rescue, Ambulance, and EMS do not exist.

TG noted that lightning is also a hazard that could possibly be a no-response for SAR/EMS.

The proposed Silver Cloud Lodge/PUD project was compared/contrasted to the existing Opus Hut, the access to the Opus Hut, and the avalanche hazards on the way to the Opus Hut.

It was discussed that guides reduce risks but using guides does not eliminate all risks, and that people are already out there unguided at present.

Discussion occurred regarding CDOT, coordination with CDOT, recent coordination with Julie Constan, of CDOT, and that CDOT might end up deciding at times to utilize Helitrax to mitigate the avalanche hazards along Highway 550.

CB and TG looked over the Appendix D (page 33) of the Avalanche Safety Plan dated April 2024.

CB's on-site staff might be prevented from helping with an emergency, in the event of a SAR/EMS arrival on-site (because the staff would not be pre-certified by SAR training, insurance, etc.).

TG and CB discussed the staff joining Search and Rescue in advance, then they can probably be utilized in the event of an emergency.

TG mentioned an MOU that was offered to another local group, and that an MOU in advance might be helpful for this site.

Test runs for EMS (personnel practicing how to handle possible emergencies on-site) and possibly developing an MOU for this site/project were discussed.

A discussion occurred regarding proposed camping and the proposed buildings.

TG reminded CB that it would be recommended that staff should follow good protocol like travel in pairs, and using beacons etc.

TG noted if someone has a stroke etc. on-site, no EMS response is guaranteed.

Discussion occurred regarding Helitrax and MBR and their protocol/variable risk tolerance levels for deciding when to fly or not fly in blizzard conditions.



**Proposed Silver Cloud Lodge/PUD, Abbreviated Notes from July 30, 2024 Meeting with SILVERTON MEDICAL RESCUE (Continued).**

CB suggested writing a protocol for/with TG for who calls which helicopter company, chain of command/phone tree of incident protocol, who gets called first, etc.

CB brought up that any ATV use at this site is only ATVs for employee/utility use (to note that guest ATV use/accidents/emergencies are not anticipated).

TG noted that 2 people injured is his agency's threshold/limit for their maximum (maxed-out agency resources). CB and TG discussed the option that if Lodge staff were SAR trained, that might be able to extend SAR capacity to respond.

TG mentioned the other local-area mutually-responding agencies (like La Plata County).

Lisa Adair (LA) asked TG about the details of EMS communication/limitations in that Chattanooga area.

TG mentioned what equipment/parts/systems are being used in that area.

Starlink, satellite phones, and landline phone were discussed and that those 3 would probably work well.

It was discussed to look into installing a landline at the Bonanza Boy Mill Site (BBMS), and that the nearby Artist Cabin probably has a landline.

TG and CB discussed various telecommunications equipment and parts, and how SAR could use the communication infrastructure installed by CB as part of their operations in the area if desired.

TG has a pre-plan binder, for high-traffic areas in the County (which specifies a plan, written in advance, to follow, if there is an emergency at that location).

A discussion occurred of what various emergency incidents might occur in summer and in winter, and doing test runs in advance between SAR and Lodge staff.

The proposed via ferrata was discussed and the construction/operation of that has well-regulated ASTM safety requirements. TG noted no major concerns for the via ferrata.

A discussion occurred regarding closing the lodge during a highway closure as opposed to shelter-in-place. CB noted that they'll usually know a little time in advance and evacuate the lodge beforehand versus having guests shelter-in-place.

The 4:15 PM meeting concluded at approximately 5:15 PM.



## **Proposed Silver Cloud Lodge/PUD, near Highway 550 at Chattanooga, San Juan County, CO**

### **Abbreviated Notes from August 6, 2024 Meeting with SAN JUAN COUNTY SHERIFF and San Juan County Building Inspector.**

Location: San Juan County Courthouse in Silverton, CO

Present: Sheriff Bruce Conrad, County Building Inspector Bevan Harris, Applicant Colby Barrett, Project Consultant Lisa Adair, Avalanche Consultant Dan Rohn (via zoom). County Administrator Willy Tookey also joined our meeting in person near the end of the meeting.

Sheriff Bruce Conrad (BC) received a copy of Rebecca Hodgett's report, which summarized a local peer review of the project Avalanche Safety Plan.

BC asked about why the avalanche experts are international, and CB noted that these experts were chosen based on their qualifications, and that they met and/or discussed the project with local experts as well as CDOT and CAIC and made multiple site visits over 2 years as part of their work.

BC mentioned he likes the project concept, and was previously part of the local Avalanche/Search and Rescue team, and the Silverton Avalanche School and his current concern is Public Safety.

Rebecca Hodgett's peer review of the project Avalanche Safety Plan was discussed, and BC appreciated a local expert familiar with the area providing feedback and review.

Sheriff (BC) asked about Bec's report mentioning avalanche (hazard level) ratings, if they are CAIC levels versus site-specific.

Dan Rohn (DR) clarified there will be a site forecaster on-site who will be rating certain parts of the site for certain uses whereas CAIC is more general and geared towards recreation.

BC asked about plowing versus grooming of the access road to the proposed lodge.

Colby Barrett (CB) explained about utilizing enclosed travel/snowcats, with safety gear.

Sheriff (BC) asked how many people (occupancy of site/lodge). CB estimated a maximum of 1 on-site resident forecaster + 11 rooms x up to 4 people per room = approximately 44 guests (max), but typically less.

Sheriff (BC) asked about how limited power might limit occupancy, and CB noted there will be hydro and solar with backup. The Sheriff (BC) noted that it can be quite windy in the Mill Creek area. BC and CB discussed relatively windy conditions in that Mill Creek "cirque."

DR compared and contrasted this project to the Camp Bird Mine Road that Helitrax monitors and the different purposes of mitigation (guests and recreation, versus a business mining operation).

Sheriff (BC) asked about any proposed security that may be planned for the on-site. CB says he'd like to talk to the Sheriff (BC) about that, and is aiming for self-sufficiency, including food and water stored on-site, and should self-sufficiency also extend to additional security measures and staff training.

CB says that the current Emergency Response Plan is a working draft. CB noted that the goal is self-sufficiency, in regards to medical, security, and fire, and that the Emergency Response Plan will continue to be developed in conjunction with input with local agencies like the Sheriff's Office.

Sheriff (BC) asked about any gate that might be proposed at/on Mill Creek Road.

CB explained possible future winter gating of Mill Creek Road, TBD by USFS, Sheriff (BC) and CB discussed the pros and cons, but it would need to go through USFS Travel Management Plan process which is scheduled for a couple of years from now.

CB described that for the meantime, transport of guests in the winter would primarily be via snowcats.

**Proposed Silver Cloud Lodge/PUD, Abbreviated Notes from August 6, 2024 Meeting with SAN JUAN COUNTY SHERIFF and San Juan County Building Inspector (continued)**

CB discussed with the Sheriff (BC) the land ownership boundaries and access.

CB showed the proposed wetlands enhancement area and that over the snow travel (like backcountry skiers that currently ski the area) would not present any problems to the wetland work, as the snow would protect the wetland work. CB described the project work of MSI, and BC reviewed the proposed stream restoration/wetlands enhancement plans.

BC expressed support for the project.

LA mentioned the proposed employee building, and the proposed emergency services station area at the employee housing/garage building, to be constructed close to the existing Artist Cabin.

BC mentioned he is a bit concerned about wildfire in general, and CB discussed the plans to utilize various fire-resistant building materials, and wildfire prevention defensible space guidelines.

Building Inspector Bevan Harris (BH) asked about the employees in the employee housing, potentially being cut off from the lodge by an avalanche on the Highway. CB noted that the forecaster staff has to be up at lodge in the winter (with guests 24-7 and overnight) at all times. A brief discussion occurred regarding the potential of any mudslides in the Chattanooga area at/around near Highway 550.

Sheriff (BC) mentioned a nearby snow-bridge fatality, and to consider restricting access to that snow-bridge potential area during dangerous times of the year.

CB and DR said how the CDOT coordination (regarding the plans on how to coordinate avalanche mitigation) has been going well.

Willy Tookey (WT) arrived to sit in on the remainder of the meeting.

CB described how the mine site is being cleaned up, and it is capping (of the mine waste rock pile), not trucking it off-site (in response to Sheriff BC's question), and CB described that they (the project team) cannot build on any (environmental) "hot spots."

CB described that the VCUP (voluntary clean up of the existing Silver Crown Mine and mine waste rock pile at the site of the proposed future lodge) is ongoing.

Sheriff BC would like a site visit, but he's away during the Aug 14th BOCC site visit/meeting.

CB noted he could show the Sheriff the site and that the VCUP guys are typically on-site Monday through Thursday 8 to 4.

CB noted that the wall construction (the gabion walls which are capping the mine waste rock pile) is going well, and that those gabion walls are looking appropriate aesthetically.

BH asked about the (existing County/USFS/Mill Creek) road above (the proposed lodge area), and CB described that it is not going to be a part of the project. CB described the proposed road realignment (close to the lodge, providing an optional turn-around area for vehicles), that the USFS liked it, and that the public can decide to go up the (existing) steep County Road, or use the new turnaround (to return to Hwy 550 and the Muleshoe Curve).

It was discussed that the County Road and Bridge Department recently fixed the road at the Muleshoe Curve after a rainstorm, and the dual/shared jurisdiction of the road (County and/or USFS) was briefly discussed. LA asked the Sheriff (BC) about any history of crimes/law enforcement issues in that general area, such as speeding, etc. Sheriff (BC) noted some instances of vandalism (rocks thrown at windows of historic buildings), "smash and grab" (a laptop stolen from a parked vehicle), speeding, avalanche incidents (winter outdoor recreation persons in the Telescope avalanche area).

The upcoming tentative Board of County Commissioners (BOCC) meeting schedule was briefly discussed, primarily by LA and WT, as follows: there is a public hearing at 9:30 AM on 8/14/24, followed by a BOCC site visit to this (Proposed Silver Cloud Lodge/PUD) site at/around 10:30 AM



**Proposed Silver Cloud Lodge/PUD, Abbreviated Notes from August 6, 2024 Meeting with SAN JUAN COUNTY SHERIFF and San Juan County Building Inspector (continued)**

(and the Commissioners will probably carpool up to site, and will probably view the VCUP area as well).

The Building Inspector BH was asked if he has any additional questions, and he noted that the staff on-site is doing well, and BH (as part of the Fire Dept. in addition to the Building Dept.) is suggesting the use of fire-resistant cladding, fire mitigation, and that the project team should plan on fire (emergency/suppression) self-sufficiency.

CB noted that specific avalanche loads will dictate glass (window placement) versus concrete (wall construction) such as the lodge wall(s) which may be currently drawn as proposed glass on the Architects' plans.

The "dugout" proposed hydro house (to be built into the sloped ground between the lodge and the camping area) was discussed briefly, and its (design/construction will be somewhat) similar to a garage recently built on Ophir Pass, according to the Building Inspector (BH).

CB described the proposed avalanche mitigation/design at/around the lodge, the existing berms, avalanche fence, and coordinating the engineering design of those features versus aesthetics.

Building Inspector BH asked if the plan is to use only daytime avalanche explosives.

CB/BH briefly discussed related details including CDOT mitigation, the Howitzer, possible future CDOT Gazex, now versus the future, currently it'll be all helicopter, with a possible future avalauncher. The slide path across (the Mill Creek gulch) from the lodge was briefly discussed, as well as the proposed type of transport tracked vehicle (military-type snowcat).

The 3:30 PM meeting concluded at approximately 4:45 PM

R.Hodgetts  
1044 Mineral Street,  
PO box 465  
Silverton,  
CO. 81211

To Whom It May Concern,

My name is Rebecca Hodgetts. As an avalanche professional who is very familiar with the area, I was asked to review the Avalanche Safety Plan (*Rev B, dated April 4, 2024*) prepared by Dynamic Avalanche Consulting for the proposed Silver Cloud Resort in Mill Creek, approximately 8 highway miles north of Silverton.

The following is a summary of my avalanche experience: I worked for the Colorado Avalanche Information Center (CAIC) as the lead forecaster for the Southern Mountains until May of 2024, owning a home and spending winters in Silverton since 2016. During this time, I managed the CAIC highway forecasting group that supports the CDOT section overseeing the avalanche areas described in the ASP as MC-N-04,06 and 08 (Muleshoe, Eagle, and Telescope). Recreationally, I have skied in the Mill Creek drainage and am very familiar with the terrain and backcountry use in the area. Before my role in the Southern Mountains, I worked as a backcountry public avalanche forecaster and highway avalanche forecaster supporting the Colorado Department of Transportation. Before beginning work for the CAIC in 2013, I was an avalanche technician and assistant Ski Patrol Director at Arapahoe Basin in Summit County, Colorado, for 12 years. Throughout the 90s and early 2000s, I ski patrolled in Canada and New Zealand. I will begin my new position as an Avalanche Specialist at the National Avalanche Center in August.

The Avalanche Safety Plan for the proposed Silver Cloud Resort meets industry standards. It achieves an appropriate risk target to manage the avalanche challenges presented by the terrain surrounding the proposed resort. It accurately describes the avalanche areas and reasonably assesses the frequency of avalanche activity and the risk to various elements exposed to the avalanche hazard. It outlines a practical, comprehensive action plan for minimizing risk to the infrastructure and persons working and recreating at the proposed Silver Cloud Resort.

The following are minor points and questions that SCR could consider adjusting in the ASP:

- Section 3.3 -Project Stakeholders: CDOT makes all road closure decisions and communicates this information. The CAIC supports and makes avalanche mitigation recommendations to CDOT, but the final decision, communication, and mitigation planning come from CDOT (as described in 1.2.2).
- Section 4.2 - FSR 821: From local anecdotal experience, the return period for a D3-sized avalanche from the MC-N-10 Bullion King path is closer to 3 years than 1. However, a conservative approach is a reasonable risk management practice for a new



forecasting operation. As the ASP outlines, the forecasters will update the plan as the operation builds accurate avalanche occurrence records.

- Section 6.4.1 - Operational Restrictions:
  - When operating under a LOW danger rating, how does SCR plan to manage vendors (such as food, cleaners, or tradespeople) who need access to the lodge and surrounding structures but will not have PPE or the specified training? The current requirement for PPE and training may be too onerous to be practical. To address this issue, some organizations allow the avalanche forecaster or operations manager to escort external personnel to and from the facility.
  - Are 30-minute check-ins practical at LOW danger? As mentioned above, this is a good practice but can be challenging when working on a large or complex task. Additionally, defining who is responsible for checking in with whom here would be good. A dispatcher is recommended later in the document. However, the typical action table should clarify this (or subscript/linked).
  - 6.4.2 - Evacuation of the Resort due to rising avalanche danger. Where do guests and personnel go? An evacuation plan should be developed (either to complement the ASP or in a Resort Operational Plan) to account for all evacuated people.

Mill Creek is a narrow, near-treeline valley with significant avalanche terrain extending over 2,000 feet above it. The proposed Silver Cloud Resort will be located at the valley's base and exposed to considerable avalanche risk through the winter. After a thorough professional review, the prepared Avalanche Safety Plan outlines a comprehensive set of procedures to appropriately manage avalanche risk for Silver Cloud Resort clients and workers in Mill Creek.

Please don't hesitate to reach out with comments or questions.

Best,

Rebecca Hodgetts



Lisa Adair <engineermountaininc@gmail.com>

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**RE: SCR ASP Updates**

1 message

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**Dan Rohn** <dan.rohn@dynamicavalanche.com>  
To: Colby Barrett <cbarrett17@gmail.com>  
Cc: Lisa Adair <engineermountaininc@gmail.com>

Thu, Aug 8, 2024 at 5:28 PM

Hi Colby,

Changes are highlighted on pages 6, 8, 18, 20, 21, 25, 26, and 30 in the following document:

[https://www.dropbox.com/scl/fi/lt7einmug5kteuv8peooz/SCR\\_Avalanche-Safety-Plan\\_Rev-C\\_20240807\\_trackchanges.pdf?rlkey=uolil2asohi6t4gl02hzub3ql&dl=0](https://www.dropbox.com/scl/fi/lt7einmug5kteuv8peooz/SCR_Avalanche-Safety-Plan_Rev-C_20240807_trackchanges.pdf?rlkey=uolil2asohi6t4gl02hzub3ql&dl=0)

Cheers,

Dan

**From:** Dan Rohn <dan.rohn@dynamicavalanche.com>  
**Sent:** Wednesday, August 7, 2024 4:32 PM  
**To:** 'Colby Barrett' <cbarrett17@gmail.com>  
**Cc:** 'Grant Statham' <grant@alpinespecialists.com>; 'Lisa Adair' <engineermountaininc@gmail.com>; 'Kevin Fogolin' <Kevin.Fogolin@dynamicavalanche.com>  
**Subject:** RE: SCR ASP Updates

Hi Colby,

We updated the ASP (Rev C) based on Rebecca's review as discussed. You can find it available for download here:

[https://www.dropbox.com/scl/fi/bi0iurbr6rsjkzqqfe1w/SCR\\_Avalanche-Safety-Plan\\_Rev-C\\_20240807.pdf?rlkey=6ezlt6twydyufuum3zl5rzocz&dl=0](https://www.dropbox.com/scl/fi/bi0iurbr6rsjkzqqfe1w/SCR_Avalanche-Safety-Plan_Rev-C_20240807.pdf?rlkey=6ezlt6twydyufuum3zl5rzocz&dl=0)

Let me know when you have the meeting details for next Wednesday.

Cheers,

Dan





# Silver Cloud Resort

## Avalanche Safety Plan

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August 7, 2024 | Rev C | 23-0032-COL-02



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### 3.3 Project Stakeholders

Avalanche safety for the SCR involves several stakeholders. While the SCR only manages avalanche safety for FSR 821 (and not Highway 550), successful winter operations require significant coordination with CDOT for lodge access via the highway and explosive avalanche control. CDOT receives support from the Colorado Avalanche Information Center (CAIC). Therefore, the local CAIC avalanche forecasters are also indirectly stakeholders associated with winter operations at the SCR.

Similarly, while the SCR is not responsible for the avalanche safety of public backcountry users, appropriate notification will be required to inform the public of operational measures such as avalanche control within the Mill Creek drainage.

Finally, while the SCR is responsible for avalanche forecasting, it may contract explosive avalanche control (AC) from nearby ski operations (referred to as "AC contractor" in this ASP). The roles and responsibilities from an avalanche safety perspective for the various stakeholders are outlined later in this ASP.

### 3.4 Project Infrastructure

This ASP includes the following SCR infrastructure which will be occupied or accessed during the avalanche season:

- **Lodge buildings:** Located at ~10,800 ft ASL in Mill Creek, the lodge area includes a number of buildings as well as facilities within the underground mine workings. This is where SCR guests will be sleeping and dining. The lodge has capacity for 36 guests as well as an Avalanche Forecaster.
- **Garage buildings:** Located downstream from the lodge area at ~10,300 ft ASL near the confluence of Mill Creek and Mineral Creek. Staff and client vehicles will be parked here, and SCR equipment and vehicles will be stored here. Staff accommodation will also be here.
- **FSR 821:** This is the ~0.6-mile-long access road between Highway 550 and the lodge area and is located on the north side of Mill Creek. During winter operations, SCR will clear the road with heavy equipment. Staff and clients will travel to the lodge in standard passenger vehicles. If snow clearing operations cannot keep up with snowfall, snowmobiles and enclosed snow vehicles may be used.
- **Hydroelectric facility:** The main power source for the SCR lodge buildings will be hydroelectric generation. This structure will be located ~1000 ft downstream from the lodge on the north side of Mill Creek at ~10,600 ft ASL, below FSR 821. Staff access (on foot or snowmobile) may be required for maintenance purposes during the avalanche season.



## 4.2 FSR 821

Two large avalanche paths, two small avalanche paths, and one short-slope path on the north side of Mill Creek affect FSR 821. Path MC-N-10 (Bullion King) is similar in character to the paths above Highway 550, with Size D3 avalanches reaching the road frequently (every 1-3 years). Path MC-N-13 (Silver Cloud) is the largest in the valley, with annual Size D3 avalanches and the potential for Size D4 avalanches with a frequency of 10- to 30-years. Both paths can produce large fast moving dry avalanches with dense flow reaching the other side of the valley and a powder component which can run up the opposite slope.

Path MC-N-09 is lower frequency, with 30-year Size D2's estimated. Path MC-N-11 is expected to produce 3-year Size D2's. Path MC-N-12 (Hydro Hill) is a steep short slope that will routinely slough onto the road, with the potential for Size D2 avalanches during large snowfall events. See Figure 5 below.



**Figure 5.** Avalanche terrain on the north side of Mill Creek affecting FSR 821. MC-N-10 (Bullion King) and MC-N-13 (Silver Cloud) frequently produce large destructive avalanches which reach the access road. The other three paths (MC-N-09, -11, and -12) are much smaller in scale.

The access road is also exposed to potential powder avalanche impacts from the south side of Mill Creek. Eight paths (MC-S-05 through -12) have been identified along the gullied north-facing terrain capable of producing Size D3 avalanches (Figure 6). These are also backcountry ski runs, locally known as the Chattanooga North zone. While dense flow is not expected to reach the access road, it is possible for powder flow to run up the north side of the valley, reaching the access road. After gaining experience operating in Mill Creek during the winter months it may be determined that only a subset of these paths present a hazard to the road.

**Table 6.** Avalanche hazard definitions and typical actions to mitigate avalanche risk to staff and clients.

Hazard Levels	Hazard Definition	Status of SCR Paths	Typical Action FSR 821 <sup>2</sup>	Typical Action Lodge Area <sup>2</sup>	
No hazard	There is insufficient snow for avalanche hazard to exist.	No hazard	No avalanche safety measures required.	No avalanche safety measures required.	Normal operations
Low	Avalanches are unlikely. <b>OR</b> Small avalanches are possible but are expected to terminate far above the road, lodge, or worksite.	SCR paths are generally cleaned out and minimal residual volume exists.	No avalanche PPE <sup>1</sup> required on the road.  Stationary road maintenance permitted with 1-hour check-ins <sup>3</sup> and avalanche PPE <sup>1</sup> required.	No avalanche PPE <sup>1</sup> required in designated lodge area.  Avalanche PPE <sup>1</sup> required outside of lodge area.	
Moderate	Small avalanches are likely but are expected to terminate above the road, lodge, or worksite. <b>AND/OR</b> Large avalanches are possible but are expected to terminate far above the road, lodge, or worksite.	Hazard remains in specific SCR paths, but none are expected to release naturally.	No avalanche PPE <sup>1</sup> required on the road.  Stationary road maintenance permitted with 30-minute check-ins <sup>3</sup> and avalanche PPE <sup>1</sup> required.  No travel on foot. No snowmobile travel without first contacting the Avalanche Forecaster.	No avalanche PPE <sup>1</sup> required in designated lodge area.  Avalanche PPE <sup>1</sup> required outside of lodge area.  No access outside of lodge area without first contacting the Avalanche Forecaster.	
Considerable	Small avalanches are very likely and may reach the road, lodge, or worksite. <b>AND/OR</b> Large avalanches are likely but are expected to terminate above the road, lodge, or worksite.	Hazard is building or residual in numerous SCR paths and natural releases may occur.	Avalanche PPE <sup>1</sup> required.  No stationary road maintenance.  Through-travel in enclosed vehicles only.	Avalanche PPE <sup>1</sup> required.  Outdoor activity limited to egress from lodge.	Evacuation and closure
High	Numerous small avalanches are expected to affect the road, lodge, or worksite. <b>AND/OR</b> One or more large avalanches are expected to affect the road, lodge, or worksite.	Avalanche cycle in progress and many SCR paths can release naturally.	Road closed.	Lodge area closed.	

<sup>1</sup>Avalanche PPE: Avalanche transceivers are worn, and there is immediate access to shovels and probes.

<sup>2</sup>SCR avalanche briefing is required for all clients/vendors, and pre-season training is required for all staff prior to being exposed to any avalanche hazard. See Section 6.2.

<sup>3</sup>Check-ins are completed with another SCR staff assigned dispatch duty. This could often be the Avalanche Forecaster; however, other SCR staff should be trained to be able to complete this role. See Section 6.7.



**Table 7.** Avalanche training outline for SCR staff.

Location	Avalanche Training Topics	Approximate Time
Indoor Presentation	Avalanche theory	30 min
	Overview of SCR avalanche terrain	30 min
	Overview of SCR avalanche program	30 min
Outdoor Practical	Introduce avalanche safety equipment	30 min
	Avalanche rescue scenarios	60 min

### 6.2.2 Client and Vendor Briefing

All SCR clients must be made aware of avalanche risk prior to booking their trip, and then require an avalanche briefing at the start of their stay, prior to exposure to avalanche hazards. For this reason, briefings should take place at the garage before travelling to the lodge and this should be explained in any pre-trip information sent to clients. Client briefings are much less comprehensive than staff training with the main purpose of making them aware of the avalanche areas, avalanche safety equipment, and safety protocols along FSR 821 and the around the lodge. The briefing could take the form of a short video, or in-person by the avalanche forecaster. This training is not intended to prepare clients who will participate in guided backcountry trips (this should be provided by the contracted guides). It is intended for access and lodging at SCR. Vendors travelling to the lodge when there is avalanche hazard must also receive this training once annually. Exceptions may be granted at the discretion of the avalanche forecaster for infrequent vendors during low hazard. This exception could come in the form of escorted travel with an SCR staff member. See Table 8 for a brief outline of client/vendor training.

**Table 8.** Avalanche training outline for clients and vendors.

Location	Avalanche Training Topics	Approximate Time
Indoor Presentation	Awareness of hazard areas and safety protocols	15 min

## 6.3 Avalanche Safety Equipment

Avalanche safety equipment (also referred to as Avalanche PPE) is a requirement of this ASP. The three key pieces of equipment for avalanche rescue are avalanche transceivers, shovels, and probes. Table 6 identifies when transceivers must be worn by clients and staff. Probes and shovels are found in rescue caches located in strategic locations. This equipment must be inspected annually as per the pre-season checklist. One important duty of the Avalanche Forecaster is to maintain, inventory, and regularly inspect SCR avalanche safety equipment.

### 6.3.1 Avalanche Transceivers

SCR needs to maintain a fleet of avalanche transceivers sufficient in quantity such that all staff and clients exposed to avalanche hazards can be equipped (e.g., approximately 40 units). Transceivers need to be modern three-antenna units that are maintained in excellent working condition. The Avalanche Forecaster should routinely check and document the battery level of all transceivers. Care and maintenance of avalanche transceivers are per the manufacturer's

recommendations, including regular software updates. Batteries should be removed from the transceivers outside of the avalanche season to prevent corrosion.

### 6.3.2 Avalanche Rescue Caches

Comprehensive rescue caches should be established in easily accessible locations in the event of an avalanche involvement. There should be one cache at the lodge and another at the garage. These rescue caches will contain avalanche probes and shovels as well as first aid and survival equipment, all within large backpacks. Rescue cache contents are listed in Appendix G. It is recommended that all SCR vehicles which regularly travel FSR 821 carry some rescue equipment as well (also listed in Appendix G).

## 6.4 Operational Restrictions

To manage the avalanche risk to SCR staff and clients, various restrictions should be implemented. These have already been introduced in Table 6.

Restrictions at one hazard level include all restrictions from the previous (lower) hazard level. Note that High hazard is not discussed in this section as it implies operational closure.

### 6.4.1 Access Road

#### Low Hazard

Once an avalanche hazard develops along FSR 821 (Low hazard or higher), baseline avalanche safety measures require all travellers to have received the SCR avalanche training (staff or client). No stopping of passenger vehicles along FSR 821. Travel on foot along the access road needs consultation with the Avalanche Forecaster. Road maintenance permitted with **1-hour** check-ins, and avalanche PPE is required.

#### Moderate Hazard

When the hazard increases to Moderate, no travel on foot is permitted along the access road, and travel on snowmobiles (or other open vehicles) needs consultation with the Avalanche Forecaster. Road maintenance is still permitted, however **30-minute** check-ins with the operator should be completed.

#### Considerable Hazard

When the hazard increases to Considerable, travel along FSR 821 is limited to through-travel in enclosed vehicles only. Road maintenance is not permitted. An increase to Considerable hazard will often precede High hazard, so evacuating the lodge area in anticipation of a closure is recommended. No travel at night during periods of Considerable hazard unless necessary due to an emergency (i.e., medical condition requiring urgent, off-site care). Both staff and clients require avalanche PPE when travelling along the road.



### 6.6.2 Shelter in Place

In some circumstances, the avalanche hazard could increase unexpectedly over a short period of time. In this scenario, staff and clients will need to shelter in place at the lodge as it may be unsafe to travel along FSR 821 (or not possible if a large avalanche deposit blocks the road). They may also have to shelter in place due to last-minute highway closure. While people are safe inside the buildings, it may not be safe outside. This scenario should be avoided as much as possible. Evacuation via helicopter should be completed at the earliest opportunity, however it may not be possible immediately due to weather or the elevated avalanche hazard at the lodge.

AC in Mill Creek should be avoided while people are occupying the lodge buildings. The priority when people are sheltering in place at the lodge should be to evacuate them when the weather allows helicopter access. Once evacuation is complete, AC can commence. In rare and undesirable circumstances, AC may be required while people are sheltering in place. While the engineered mitigation is designed to protect the buildings from damaging avalanche impacts, it is recommended to shelter within the mine portal if AC is taking place.

During a shelter in place scenario, the consequences of other emergencies (e.g., fire, medical) are increased. Closures could be extended, which means the lodge buildings need to be equipped with up to one week's food and water rations. Heating and electrical systems need redundancy in case of this situation.

### 6.6.3 Minimizing Operational Pressure

It is important that closures are respected and that operational pressures do not cause the re-opening of SCR operations prematurely. To minimize operational pressures, clients should be made aware prior to booking that last-minute closures of the lodge due to elevated avalanche hazard are possible. There should be thorough contingency plans in place to house clients elsewhere during closure periods. During active avalanche winters, lodge closures (and therefore client booking cancellations) must be anticipated with greater frequency. It is the responsibility of SCR management to support the Avalanche Forecaster in their decision for closure.

## 6.7 Communications and Check-ins

It is important that personnel travelling or working in avalanche areas are equipped with at least one reliable means of communicating with other personnel and with outside resources. VHF radios are the standard communication tool. Satellite phones or satellite communication devices (i.e., SPOT, InReach) should be used as backup communication.

A check-in system is required for work and travel in avalanche areas. Vehicles should announce over the radio when they are beginning to travel along FSR 821, and they should again announce when they have reached the other end of the road. Maintenance equipment should check-in every hour during periods of Low hazard, and every 30 minutes during Moderate hazard (and for through-travel at Considerable hazard).

For the check-in procedure to be effective, one SCR staff should be assigned dispatch duty. This duty could often be taken by the Avalanche Forecaster; however, other staff members should be

trained in this role. In addition to checking in with other staff, the dispatcher would contact outside resources during emergencies, and should therefore be familiar with the Avalanche Rescue Plan (Appendix H). The dispatcher could be located at the Lodge or the Garage.

The frequency of check-ins for other tasks will depend on the level of risk. More frequent check-ins are recommended when staff are more vulnerable (i.e., work on foot), are more exposed (i.e., stationary work in avalanche terrain), or when the avalanche hazard is elevated.

## 6.8 Avalanche Gate and Signage

The entrance to FSR 821 from Highway 550 will be gated during the avalanche season. This is to ensure that public vehicles do not access the plowed FSR 821, thereby unknowingly exposing themselves to avalanche hazard. This will not stop ski tourers from accessing Mill Creek but will simply prevent public road traffic.

Avalanche signage will be installed on the gate notifying the public of the avalanche hazard along FSR 821 (and therefore the reason that access is closed). On days when avalanche control is planned, a notice will be posted on the gate and at the Columbine Lake Trailhead (and other common parking areas which access Mill Creek).

Signage should identify each avalanche path along FSR 821 such that avalanche observations can easily be reported by road traffic (e.g., road maintenance personnel) to the SCR dispatch and Avalanche Forecaster. These signs should be positioned at the boundaries between paths.

While clients will be informed of avalanche restrictions at the Lodge Area during their training, signage will also be installed to clearly mark the boundaries of the Lodge Area.

## 6.9 Working Alone in Avalanche Hazard Areas

For the purposes of this ASP, working alone means when one person (or multiple people in one vehicle) are working in an avalanche area. In general, working alone in avalanche areas should be avoided. If required, a check-in procedure should be implemented at intervals that increase with in frequency with the avalanche hazard, for example a 15-, 30- or 60-minute mandatory check-in (plan to be approved by the Avalanche Forecaster).

## 6.10 Procedures for Roads Blocked by Avalanche Deposit

In the scenario in which an avalanche deposit is encountered by SCR personnel on Highway 550 while it is open, CDOT will coordinate traffic control. Immediately turn on 4-way flashers and do not get out of the vehicle. Try to safely reverse back out of the avalanche path and into a safe area. Be aware of other highway traffic.

If an unexpected avalanche deposit is blocking FSR 821, staff and clients should stay in the vehicle and back out to a safe area. If a vehicle is struck by an avalanche and becomes stuck, do not exit the vehicle. Contact the Avalanche Forecaster and await direction. If avalanche deposits are on the road after a closure or explosive avalanche control, advice on deposit removal will be provided to equipment operators by the Avalanche Forecaster.



## Appendix B – Magnitude Frequency Tables

### Mill Creek North:

Path ID (Name)	Avalanche Return Period to Element(s) at Risk (years)				Avalanche Type	Element(s) at Risk	Comments
	Size 2	Size 3	Size 4	Size 5			
MC-N-04 (Eagle)	1	3	N/A	N/A	Mixed	Highway 550	Managed by CDOT. Powder cloud from extreme event may dust the garage area; however, with no impact forces.
MC-N-06 (Telescope)	1	3	N/A	N/A	Mixed	Highway 550	Managed by CDOT.
MC-N-08 (Muleshoe)	1	3	N/A	N/A	Mixed	Highway 550	Managed by CDOT.
MC-N-09	10	30	N/A	N/A	Dense	FSR 821	Small sparsely forested rocky start zones, shallow gully in runoff. Infrequently effects access road switchback.
MC-N-10 (Bullion King)	1	3	N/A	N/A	Mixec	FSR 821	Large gully with broad start zone, runs out onto debris fan, across the access road, and can cross the valley.
MC-N-11	3	10	N/A	N/A	Mixec	FSR 821	Sparsely forested starting zone, steep open slope below. Access road crosses through lower track.
MC-N-12 (Hydro Hill)	3	N/A	N/A	N/A	Dense	FSR 821	Short, open slope immediately upslope of the road near the hydroelectric facility.
MC-N-13 (Silver Cloud)	N/A N/A N/A	3 10 N/A	10 10 100	N/A	Mixed Powder Mixed	FSR 821 Lodge Area Hydroelectric	Very large, broad alpine bowl converges into narrow gully at the access road. Avalanches turn in valley bottom and runoff towards the hydroelectric facility.
MC-N-17	30	100	N/A	N/A	Dense	Lodge Area	Short slope with avalanches starting at upper end of talus slope. Avalanche wall and fence will protect buildings from impacts. Potential for design event to run-up and over the buildings with deposits in the lodge area.
MC-N-19	N/A	100	N/A	N/A	Dense	Lodge Area	Short slope with small avalanches starting at upper end of talus slope. Theoretical design event could impact the Lodge area similarly to MC-N-17.
MC-N-20	N/A	100	N/A	N/A	Powder	Lodge Area	Dense flow will be diverted by topography from lodge buildings. Potential for powder impacts from design event.