WORK SESSION – Silverton Board of Trustees
Silverton Town Hall – Monday, July 21, 2025
Call to Order & Roll Call –Work Session @5:30pm

ATTENTION: The Town of Silverton Trustee meetings are being conducted in a hybrid virtual/in-person. Instructions for public participation in Town Trustee meetings are as follows:

- Zoom Webinar Link: https://us02web.zoom.us/j/88637487127
- By Telephone: Dial 669-900-6833 and enter Webinar ID 886 3748 7127 when prompted.
- YouTube (live and recorded for later viewing, does not support public comment): www.youtube.com/channel/UCmJgal9lUXK5TZahHugprpQ

MEETING PROTOCOLS: Please turn off cell phones; be respectful and take personal conversations into the lobby. The public is invited to attend all regular meetings and work sessions of the Board of Trustees. Regular Meeting Closing Public Comment must be related to an agenda item.

Work Session @ 5:30pm

1) Brownfields Prioritization

Adjourn

Up-coming Meeting Dates:

7/22 @4pm Personnel and Ordinance Committee Meeting
7/23 @5pm Utility Committee Meeting
7/28 @5:30pm Regular Meeting of the Board of Trustees

End of Agenda

SILVERTON HOUSING AUTHORITY
Silverton Town Hall – Monday, July 21, 2025
Call to Order & Roll Call – @5:00pm

ATTENTION: The Town of Silverton Housing Authority meetings are being conducted in a hybrid virtual/in-person. Instructions for public participation in Town Trustee meetings are as follows:

Zoom Webinar Link: https://us02web.zoom.us/j/88637487127
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If you would like to make a public comment during a specific Agenda Item, please submit a request to the SHA Director, Anne Chase achase@silverton.co.us

MEETING PROTOCOLS: Please turn off cell phones; be respectful and take personal conversations into the lobby. The public is invited to attend all regular meetings and work sessions of the Board of Trustees. Regular Meeting Closing Public Comment must be related to an agenda item.

AGENDA:

1. Staff / Board Revisions to Agenda
2. Public Comment
3. Approval of 6/2/2025 Meeting Minutes
4. Presentation: Silverton Critical MASS – Jordan Bierma
5. Director's Report

Upcoming meetings:

- August 4th, 2025 @ 5:30pm

SILVERTON HOUSING AUTHORITY MEETING MINUTES
Silverton Town Hall – Monday, June 2, 2025
Call to Order & Roll Call – @5:30pm

ATTENTION: The Town of Silverton Housing Authority meetings are being conducted in a hybrid virtual/in-person. Instructions for public participation in Town Trustee meetings are as follows:

Zoom Webinar Link: https://us02web.zoom.us/j/88637487127
By Telephone: Dial 669-900-6833 and enter Webinar ID 886 3748 7127 when prompted.
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MEETING PROTOCOLS: Please turn off cell phones; be respectful and take personal conversations into the lobby. The public is invited to attend all regular meetings and work sessions of the Board of Trustees. Regular Meeting Closing Public Comment must be related to an agenda item.

Present: Trustee Schnitker, Trustee Wakefield, Trustee Gardiner, Trustee Halvorson, Trustee George, Mayor Pro Tem Harper, Mayor Kranker
Absent:
Staff: Administrator Kaasch-Buerger, Clerk Melina Marks, Housing Director Anne Chase

Silverton Housing Authority Meeting @5:30pm

AGENDA:

1. Staff / Board Revisions to Agenda
2. Public Comment
3. Approval of 5.12.25 Meeting Minutes

Trustee Gardiner moved, and Trustee George seconded to approve the 5.12.25 meeting minutes. Passed unanimously with roll call.

4. Resolution 2025-06 A Resolution of the Housing authority of the Town of Silverton Authorizing Anvil Townhomes LLC to Enter into a Construction Loan Agreement for the Anvil Townhomes Development.
    - Director Anne Chase provided background regarding the proposed Resolution 2025-06.
    - Anne explained how this Resolution relates to the Silverton Compass Master Plan.
    - Anne explained the 2 different scenarios presented in the SHA packet.
    - Trustee Schnitker asked about the $70,000 savings in construction cost.

- Bleeker Seaman with Tributary spoke about the cost-saving options.
- Jack Jones spoke about their communications with Fading West.
- Trustee George asked about option B where the cost of the houses go up, are they still actually affordable?
- Director Anne Chase explained the scale of AMI (area mean income) and the risks of option B.
- Mayor Kranker asked how confident staff feels they units will still sell.
- Anne said she still feels confident the units will sell, though it may take a little longer.
- Jack Jones noted that the 9 units would still be well below market rate, even if we had to go with option B.

5. Development Services Agreement - Anvil Townhomes.
    - Director Anne Chase provided context regarding this development service agreement.

Trustee George moved, and Trustee Gardiner seconded to authorize Anvil Townhomes LLC to enter into a draft Development Services Agreement with Tributary Development LLC. Passed unanimously with roll call.

6/2/2025 Meeting Minutes Approved on 7/21/2025

_____ **_____**

Melina Marks, SHA Appointed Secretary **Dayna Kranker, Chairperson**

AGENDA MEMO

SUBJECT: **AMI Presentation Silverton Critical MASS**
MEETING DATE: **7/21/25**
STAFF CONTACT: Anne Chase, Director

Overview of Area Median Income (AMI) and Rental Rate Calculation in San Juan County:
Each year, the U.S. Department of Housing and Urban Development (HUD) calculates Area Median Income (AMI) levels to establish eligibility thresholds for affordable housing programs. In Colorado, the Colorado Housing and Finance Authority (CHFA) uses these calculations to set Maximum Rental Rates for properties supported by CHFA funding by calculating a maximum 30% of a household's income going to housing costs, including utilities. These rates are further adopted by the Colorado Department of Local Affairs (DOLA) to guide regulatory enforcement of state-funded housing.

HUD calculates AMI using data from the American Community Survey, which is adjusted for inflation and other economic factors. The result reflects the estimated median income of a four-person household in each area. Income limits are then scaled for different household sizes and income levels relative to the median. Over the past three years, AMI in San Juan County has increased by approximately 7% annually. While HUD limits annual increases to 10%, the combination of data lags, regional averaging, and small sample sizes may mean the published AMI does not fully reflect current income realities in Silverton.

Silverton Critical MASS (Mutual Aid and Solidarity of Silverton), is proposing an alternative method of calculating Maximum Rental Rates to be adopted in the Silverton Affordable Housing Guidelines.

Applicability of Maximum Rental Rates in Silverton:

- The Silverton Housing Authority adopts the Colorado Housing and Finance Authority Maximum Rental Rates in the Silverton Affordable Housing Guidelines for regulatory purposes. These rates apply solely to properties encumbered by SHA Affordability Covenants or those directly owned and managed by the SHA (of which none currently exist).
- The purpose of adopting CHFA's rental rates is to meet compliance requirements of state-funded programs. It is not the intention of the SHA to influence the broader private rental market in Silverton by way of the Affordable Housing Guidelines.
- CHFA's rental rates include a utility allowance to be set by the property owner when the property is funded by a CHFA program and calculate rental rates to be no more than 30% of a household's income at each AMI level.

Considerations for Amending Maximum Rental Rates in the Silverton Affordable Housing Guidelines:

- When a jurisdiction has a funding source for housing development that does not have an AMI limit dictated, they can set different AMI levels in their Guidelines and/or Deed Restriction for a particular development.

However, the Silverton Housing Authority does not have any developments to date, or in the project pipeline, that has not already used State funding.

- The Maximum Rental Rate is a cap, not a mandate. Property owners and SHA may choose to set lower rents based on local needs or project feasibility. For example, San Juan County, sets the rental rates for the Anvil Apartments to be significantly lower than CHFA's published maximums.
- Lowering the rental rate cap in SHA Guidelines could limit the financial viability of future projects. Reduced income from a property increases the funding gap which may prevent the project from being financially feasible either at the beginning of the project, or once it is operational. While the goal of the Housing Authority and the funders (CHFA, State, Foundations, San Juan County, Town of Silverton) is to have the project be as affordable as possible for the future tenants, if the maximum funding award doesn't cover the revenue gap, the project will not work. Having the flexibility to strike a balance between affordability and financial feasibility is essential.
- Small scale rental housing developments are notoriously difficult to fund. Most rental developments targeting households earning below 60% AMI require Low-Income Housing Tax Credit (LIHTC) financing, which typically favors projects of 20 or more units. SHA's current concepts for the Zanoni Parcel and Boxcar Site are below this threshold, making financing options more challenging, which is incentive to minimize the funding gap as much as possible without compromising quality or intention.
- SHA does not currently have an operating revenue stream to offset rental deficits. While San Juan County has been able to subsidize Anvil Apartments in years with operational losses, SHA lacks comparable reserves.
- New programs, such as CHFA's Tenant Equity Vehicle and CHFA Rent Reporting offer tools for helping tenants build wealth and credit. These could be applied to future SHA rental properties if our projects are awarded CHFA funds.

Staff Identified Options:

1. Support Community-Led Metrics: SHA could acknowledge local organizations such as Silverton Critical MASS, which may publish alternate rental benchmarks. SHA can share or reference these resources, but does not adopt the rates in the Guidelines due to potential conflicts with future project feasibility.
2. Add Covenant-Based Restrictions: SHA could revise the Guidelines to prohibit owners of SHA-regulated properties from charging rents above their monthly mortgage payment, where the Maximum Rental Rate would otherwise allow for a higher amount.
3. Formalize a Best Practice Standard: SHA could add language encouraging rents in SHA-owned properties to be set as low as financially feasible, balancing affordability with the need for long-term sustainability.

Adjusted Rental Guidelines for Silverton, CO

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Created By: Critical MASS (Mutual Aid and Solidarity in Silverton)
Presented by: Jordan Bierma

Why adjust rental guidelines?

How AMI is used when purchasing a deed restricted affordable house:

(for this example assume 100% AMI)

- AMI is the entry measurement of determination.
- Mortgage broker, lenders, home assistance organizations, etc. gather info on dozens of other metrics. For example, income, savings, employment history, debts, and more.
- Example scenario of a 100% AMI family purchasing a 3br house will have a mortgage between $1,300-1,500 a month.

—

Versus...

How AMI is used in current rental guidelines:

(for this example assume 100% AMI)

- AMI is the end measurement of guidelines and no other metric is used.
- Assumes every bedroom in a house is occupied by an employed working individual.
- Disadvantages families, elderly, or disabled renters even though these groups tend to on average be more stable renters.
- Example scenario of what is classified as an "affordable" rental for 100% AMI 3br unit is $2,450 a month.

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There is $1,000 a month difference between what is classified as "affordable" by using AMI as the only measuring stick of affordability.

What is the outcome of creating better rental guidelines?

- Aligns better with CHFA and HUD income to housing costs ratio.
- Provide opportunities for renters to actually save to purchase homes.
- Provides better tools for both landlords and renters to negotiate fair rental rates.
- Renters generally are lower income than homeowners and accounting for that skew is important in determining affordability.

Silverton, CO Rental Housing Guidelines: Side-by-Side Comparison

Category	Current Rental Guidelines (AMI-Based) 100% AMI based on the 02/10/25 Silverton Affordable Housing Guidelines	Proposed Rental Guidelines (Blended Income-Based)
Basis for Income	San Juan County Area Median Income (AMI), updated annually	Average of: MIT Living Wage (San Juan County), Colorado State Minimum Wage, Local Average Renter Income, and San Juan County AMI
AMI (Example 2024)	**100% AMI for 1 person: $66,000/year** (~$5,500/month) — calculated as: $66,000 ÷ 12 months = $5,500/month	Blended Hourly Wage: $21.15/hour 1. **MIT Living Wage for San Juan County** (2024 estimate): ~$18.02/hour 2. **Colorado State Minimum Wage** (2024): $14.42/hour 3. **Local Average Renter Income Equivalent** (Estimate from housing study): ~$17.60/hour 4. **San Juan County AMI Equivalent Hourly Wage**: ~$31.73/hour ○ ($66,000/year ÷ 2,080 work hours/year) *****Calculation:**  Monthly Gross Income (40 hrs/week): $3,785.50

Affordability Threshold	30% of AMI monthly income	30% of blended monthly income
Max Housing Cost (incl. utilities)	~$1,650/month (30% of $5,500)	$1,135.50/month (30% of $3,785.50)
Average Monthly Utility Cost	Not explicitly factored in	Estimated at $250/month (based on local averages and included based on HUD affordability guidelines to include utilities in the 30%) Local averages factored in include: -**Electricity (San Miguel Power)**: ~$100–$120/month average for small households -**Heating (propane or electric)**: ~$80–$100/month depending on season -Water/Sewer/Trash (Town of Silverton flat rate) -**Internet (local provider average)**: ~$60–$80/month for basic broadband

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Calculation:

$$\text{Blended Hourly Wage} = \frac{18.02 + 14.42 + 17.60 + 31.73}{4} = \frac{81.77}{4} = 20.4425 \approx 21.15$$

Unit-Specific Rent Guidelines

*prices exclude utilities

Category	*Current Rental Guidelines (AMI-Based) 100% AMI based on the 02/10/25 Silverton Affordable Housing Guidelines	*Proposed Rental Guidelines (Blended Income-Based)
Studio / Micro	$1,650/month	One earner: $850/month maximum rent
1br	$1,767/month	One earner: $850/month maximum rent
2br	$2,120/month	One earner: $850/month maximum rent Two earners: 1950/month maximum rent
3br	$2,450/month	One earner: $850/month maximum rent Two or *more earners: $1950/month maximum rent *adjustment to rent cost based upon earners would account for their monthly gross income minus the fractional utility cost not to exceed $3,450 if all renters are maximum earners.
4br	$2,732/month	One earner: $850/month maximum rent Two or *more earners: $1950/month maximum rent *adjustment to rent cost based upon earners would account for their monthly gross income minus the fractional utility cost not to exceed $4,150 if all renters are maximum earners.

Goals:

- Discussion, questions and direction from the board.
- Approval and adoption of the amended rental guidelines by the board.

Silverton Housing Authority
Director's Report

Department: Housing
Head of Department: Anne Chase
Date of SHA Board meeting: 7/21/2025

For immediate Trustee consideration:

- Boxcar Site Brownfields prioritization (during TOS Work Session 7/21/25).

Regular Meetings & Communication:

- Weekly Region 9 Housing Leads Check In.
- Weekly Housing Check-In w/ Gloria.
- Tributary Development project coordination meetings x 4.
- Meeting with Colorado Department of Local Affairs concerning AHOP Grant (Anvil Townhomes) 6/10.
- Meetings with First Southwest Bank concerning construction loan 6/11, 6/26.
- Meeting with Town of Breckenridge Construction Manager to discuss RFP best practices 6/16.
- Meeting with DOLA about becoming an ADU supportive jurisdiction under HB24-1152 6/18.
- Development Agreement legal review 6/20.
- Region 9 loan pay off meeting 6/30.
- Community Development Director meeting for Brownfields and Boxcar site discussion.
- Planning Commission for Fast-Track ordinance 7/15.
- Public Works meeting with Tributary Development 7/15.
- Housing Strategies Peer Exchange 7/17.
- DOH meeting AHOP Grant 7/17.

Top on the TO DO list:

- Draft Anvil Townhomes Ownership Program for Silverton Affordable Housing Guidelines to be reviewed during SHA meeting August 4th.
- Finalize the remaining required actions to close on construction loan by early next month.
- Continued coordination with Tributary, Fading West, and CDOT on project timeline.
- Amend code for fast-track requirements of Prop 123 to earn Local Planning Capacity Grant bonus $50,000 to support Director's salary next year.
- Reviewing Town's LUC for HB24-1152 compliance & work towards becoming an ADU Supportive Jurisdiction to increase grant opportunities for the ADU pattern book.

Upcoming Issues:

- Short Term Rental Regulatory Fee research and proposal to Town of Silverton Finance Committee.

Notable completed tasks:

- Earned the University of Denver's Executive Certificate in Affordable Housing.
- Completed final grant reporting for State end of fiscal year (LPC and EIAF More Housing Now grants).
- Awarded $450,000 from the Colorado Health Foundation for the Anvil Townhomes Development.
- Anvil Townhomes LLC received tax exemption status from the State of Colorado.
- Paid off loan with Region 9 Economic Development for Fading West factory deposit.

Grants (applications, updates, awards):

- EIAF More Housing Now: On Pause for Boxcar Apartment Site until Board direction is given 7/21. Received Avalanche Study and the site is not in an avalanche zone.
- DOH Prop 123 – AHOP: Grant agreement has been signed by SHA – awaiting executed agreement from DOH.
- Colorado Health Foundation: $450,000 awarded for the Anvil Townhomes Development.
- LPC: Weekly Personal Activity Reports and monthly reimbursement requests for Town's Housing Coordinator position (i.e. Director, Silverton Housing Authority).
- CHFA ADU Pattern Book: Working towards becoming an ADU Supportive Jurisdiction according to HB24-1152 to be eligible for more grant funding. Estimated RFP release for ADU Stock Plans: Q4 of 2025.

Ongoing Project Updates:

- Anvil Townhomes funding gap is filled. Delay on construction loan closing – estimated early August. Assessing CDOT width restrictions in Pagosa Springs and Coal Bank Pass impact on project timeline. Executed Development Agreement with Tributary Development.
- Boxcar Apartment Avalanche Study completed.
- Homebuyer Education Coordinating a Spanish Homebuyer Education Class for this fall.
- ADU Pattern Book Beginning to assess compliance with HB24-1152 to access additional grant funding.
- Zanoni Parcel materials management plan completed, IHOI grant expended & expired. On pause until Staff has more capacity to explore project timeline.
- Multijurisdictional Housing Authority research underway – should be an agenda item at an upcoming Town/County meeting if Board agrees.

Learning/ Professional Development:

- Earned Executive Certificate in Affordable Housing from the University of Denver 6/7/25.
- Housing Peer Exchange monthly webinar.

AGENDA MEMO

SUBJECT: Brownfield's Grant Project Prioritization
STAFF CONTACT: Lucy Mulvihill & Anne Chase
MEETING DATE: 7.21.2025

Overview:
The Town of Silverton received a Brownfields Grant from the Environmental Protection Agency (EPA) for environmental assessment and cleanup of Brownfields sites in Silverton. A *Brownfield* is a property where the presence or potential presence of a hazardous substance, pollutant, or contaminant may inhibit future use or redevelopment. The goal of this grant is to revitalize environmentally impacted lands to support the re-use of the property. Our grant work plan highlights Recreation, Community Use and affordable housing as key priorities in future reuse.

The initial work plan identified the following sites as priority areas:

- Boxcar Apartment Site – for the future development of 12 units of affordable housing
- Lackawanna Mill Site – for potential reuse as a community space
- Animas River Corridor – for accessible outdoor recreation and a trail system
- Cement Creek Corridor – for future outdoor recreation use

Progress to Date
Since receiving the grant in 2023, the Town has completed the following activities:

- Boxcar Site
  - Phase I & Phase II Environmental Site Assessments (ESA)
- Lackawanna Mill
  - Phase I & II Environmental Site Assessments
  - Structural assessment (report pending)
  - Renderings and preliminary cost estimates (provided at no cost by EPA Land Revitalization Planning Program)
- Grant Spending
  - $178,156 spent to date
  - $621,844 in grant funds remain
  - All funds must be obligated or spent by 2028

Staff is seeking Board direction on how to prioritize next steps and allocate remaining grant funds, given updated site information. Some cost estimates are still pending, so this memo focuses on identifying which project(s) to move forward with.

<u>Boxcar Site Update</u>
The avalanche hazard assessment and mapping completed by Wilbur Engineering concluded that the Boxcar Site is outside of the Red (High) and the Blue (Moderate) avalanche hazard zones. SGM has paused work until Staff receives direction to proceed from the Board of Trustees.

<u>Boxcar Next Steps</u>

1. **Remedial Action Plan: $**30,000 via Brownfields Grant

AGENDA MEMO

SUBJECT: Brownfield's Grant Project Prioritization
STAFF CONTACT: Lucy Mulvihill & Anne Chase
MEETING DATE: 7.21.2025

The Remedial Action Plan (RAP) lays out the remediation or clean-up plan for the property based on the Phase II results, including cost estimates.

2. **Finalizing site engineering plans:** $79,281 through EIAF More Housing Now Grant. SGM Engineering completes site grading and infrastructure plans using the remaining funds from the More Housing Now Grant. $40,700 spent to date on engineering plans, surveys, geotechnical analysis, and an avalanche study through the grant.

3. **Site Remediation:** Cost TBD via Brownfields Grant
   The Site remediation is the actual clean-up activities of the site. This can potentially include some predevelopment work. The scope and cost estimate will be outlined in the RAP.

4. **Site Preparation:** $473,139 - $696,117 depending on site plan. Funding Source TBD, likely DOLA.
   Scope includes slope stabilization, drainage work, utilities, contingencies, etc.). Slope stabilization along NW property boundary has major cost implications for the project, which may be remedied by site remediation efforts.

5. **Apartment development**: (~$4,300,000 funding source TBD)
   Small-scale affordable rental projects are notoriously difficult to fund. RFP for the project would likely go out to bid in 2026.

Lackawanna Update

The Lackawanna Mill site was discussed during the Kendall Mountain Master Planning process. The community identified the site as a potential location for a future community center, makerspace, or recreation facility. Additional community input would take place during any future re-use planning.

The EPA has provided the Town with free renderings and cost estimates to support future visioning sessions. Initial findings from a recent structural assessment show that the building is in good condition. While significant renovations will be needed, the required structural work is expected to be minimal.

The Lackawanna Mill also has the potential to tie into the Animas River Corridor project. It could serve as a facility that is rented out to generate income for the Town.

Lackawanna Next Steps

1. **Remedial Action Plan: Cost TBD** via Brownfields Grant
   The Remedial Action Plan (RAP) lays out the remediation or clean-up plan for the property based on the Phase II results, including cost estimates.

2. **Site Remediation:** Cost TBD via Brownfields Grant
   The Site remediation is the actual clean-up activities of the site. This can potentially include some predevelopment work. The scope and cost estimate will be outlined in the RAP.

SUBJECT: Brownfield's Grant Project Prioritization
STAFF CONTACT: Lucy Mulvihill & Anne Chase
MEETING DATE: 7.21.2025

3. **Community Visioning Session for future reuse**

4. **Building Renovations:** Cost TBD, Funding Source TBD

5. **Access Improvements**: Cost TBD, Funding Source TBD

Animas River Corridor Update

The Town has submitted a Natural Resource Damages (NRD) request for $3.3 million to revitalize the Animas River Corridor. This plan includes the conveyance of the Recreation and Public Purposes (R&PP) lands along the river corridor. The conveyance may make these lands eligible for brownfield funding to support environmental cleanup, if contamination is identified through an initial Phase I Environmental Assessment, which will be completed prior to the conveyance.

Animas River Corridor Next Steps

1. **Eligibility Form**
   The form has been submitted, and we are awaiting a response from the EPA.

2. **Phase I ESA**

Budget:

The decision on which sites to proceed with will impact the allocation of Brownfields grant funds and future funding strategies for each project.

Staff Recommendations:

The purpose of the Brownfields Grant is to support the revitalization of environmentally impacted properties for community benefit. Staff recommends prioritizing the sites that the Town is most committed to advancing.

Master Plan:

Create and Preserve Affordable Housing
Animas River Corridor

Trustee Priorities 2025-2028:

1.2 OBJECTIVE: Prioritize the following projects in the next two years
   e. Brownfields Grant
   f. Perimeter Trail
3. Support Affordable Workforce Housing

Attachments:

1. Avalanche Hazard Assessment and Mapping for Silverton Boxcar Apartments Development Lots 1 and 32 Anvil Mountain Subdivision.

AGENDA MEMO

SUBJECT: Brownfield's Grant Project Prioritization
STAFF CONTACT: Lucy Mulvihill & Anne Chase
MEETING DATE: 7.21.2025

Direction:
Staff seeks direction on
which projects to prioritize for the next steps using Brownfields Grant funds. Options include:

1. Proceed with RAP for Boxcar Site
2. Proceed with RAP for Lackawanna Mill.
3. Proceed with RAPs for Both Sites.
4. Explore Other Brownfields-Eligible sites such as the Animas River Corridor.

AVALANCHE HAZARD ASSESSMENT & MAPPING

for

SILVERTON BOXCAR HOUSING DEVELOPMENT LOTS 1 AND 32 ANVIL MOUNTAIN SUBDIVISION SILVERTON, COLORADO

Prepared for:

Silverton Housing Authority
Anne Chase, Director
Town of Silverton

Prepared by:

Wilbur Engineering, Inc.
Durango, Colorado

June 9, 2025

WILBUR ENGINEERING, INC.

150 East 9 St., Suite 201 • Durango CO 81301
(970) 247-1488 • chris@mearsandwilbur.com

June 9, 2025

Anne Chase, Director
Silverton Housing Authority
Town of Silverton
via email

RE: Avalanche Hazard Assessment & Mapping
Silverton Boxcar Housing Development
Lots 1 and 32, Anvil Mountain Subdivision
Silverton, San Juan County, Colorado

Dear Ms. Chase:

At your request, we have completed our avalanche hazard assessment. We have concluded that both lots are outside of the Red (High) and Blue (Moderate) avalanche hazard zones.

If you have any questions, please contact me at (970) 247-1488.

Sincerely,
Wilbur Engineering, Inc.

Chris Wilbur, P.E.

Contents

Figures

Appendix

1. Introduction

This report describes snow avalanche hazards for a planned multi-family residential development on Lots 1 and 32, Anvil Mountain Subdivision, Silverton, Colorado. Figure 1 shows the site location on a CalTopo slope angle topographic map. The site is north of Highway 550 and south of Shrine Road with access from 6th Street. Figure 2 shows the site on a Google Earth image.

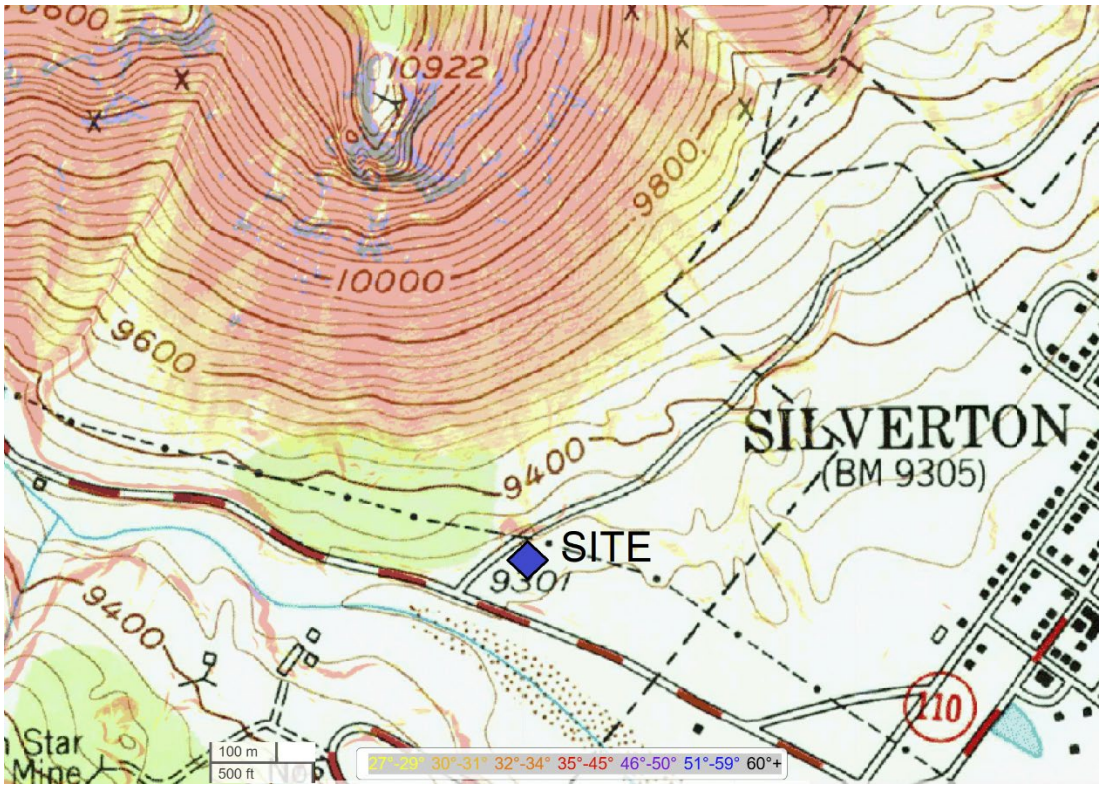

Figure 1 – Site Location Map

Figure 2 – Site on 2019 Google Earth Image

Two Concept Site Plans dated January 14, 2025 prepared by SGM are shown in Figure 3 and Figure 4. Both concept plans show retaining walls along the property lines behind each building.

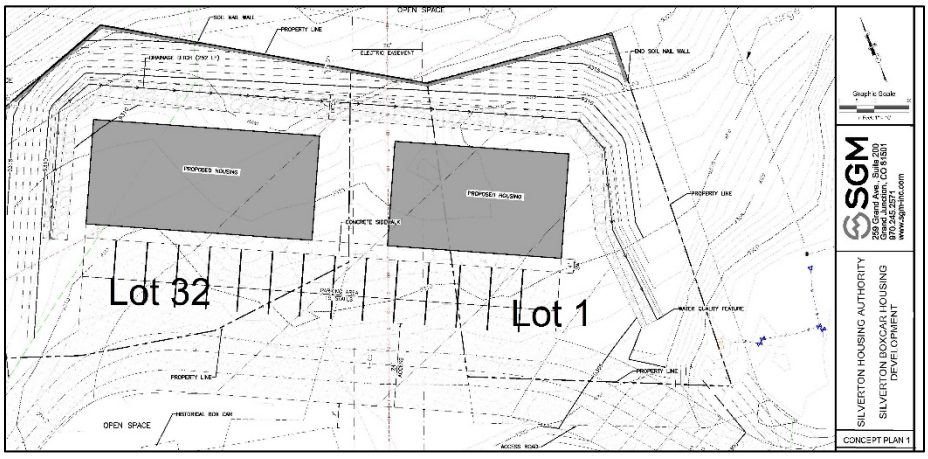

Figure 3 – Excerpt from Concept Plan 1

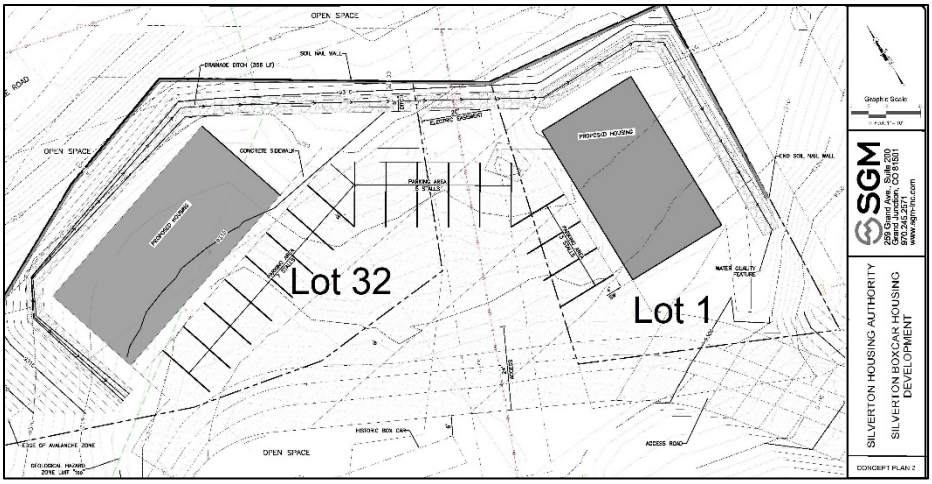

Figure 4 – Excerpt from Concept Plan 2

2. Objectives

This report has the following **objectives**:

1. Describe the regional snow and avalanche climate.
2. Delineate "Red" (high-hazard)[1] and "Blue" (low-hazard)[2] Avalanche.
3. Describe methods used to develop the Avalanche Hazard Map.
4. Describe avalanche risks in relation to the planned multi-family residential land use.
5. Provide recommendations to avoid or reduce exposure to avalanche hazards for the planned site development.
6. Provide general recommendations for the locations and orientations of the proposed structures along with conceptual mitigation measures, if warranted.

3. Limitations

This report also has the following **limitations**, which must be understood by all those relying on the results, conclusions, and recommendations:

[1] The *Blue Zone* is defined as an area where avalanches have a return period ranging from 30 to 300 years (3% to 0.3% annual probability) *and* where avalanches produce impact pressures of less than 600 lbs/ft^2 on a flat surface normal to flow.

[2] The *Red Zone* is an area where avalanches have a return period of 30 years or less *or* produce impact pressures of 600 lbs/ft^2 *or* greater on a flat surface normal to flow.

1. Avalanches larger than the 300-year average return period avalanche are possible, will travel farther, spread wider, and possess greater impact pressures.
2. This study is site and time specific; it should not be applied to adjacent lands, nor should it be used without updating in the future when additional data and improved methods become available.
3. The avalanche hazard assessment is based on current forest and climatic conditions. Changes in forest cover and/or climatic conditions could increase or decrease the avalanche hazard.

4. Methods

The avalanche hazard assessment, mapping and recommendations presented in this report are based on:

1. Review of reference documents listed in Section 12 of this report.
2. Terrain analyses using a 3-meter topographic map derived from LiDAR data downloaded from the USGS 3D Elevation Program (3DEP);
3. Site observations of vegetation and ground conditions made by Chris Wilbur on April 10, 2025 and June 4, 2025 during snow-free conditions.
4. Analysis of various sources of aerial imagery, including Google Earth, Bing, USGS, USDA, and San Juan County GIS Department.
5. Review of historic weather data, including SNOTEL, Coop Weather Stations, Colorado Avalanche Information Center (CAIC) and the Center for Snow and Avalanche Studies (CSAS).
6. Avalanche dynamic modeling with the Swiss program, RAMMS, Version 1.8.0.
7. Our local and regional knowledge of terrain, climate and avalanche hazards.

5. Avalanche History

Avalanche history is documented in *Century of Struggle Against Snow: A History of Avalanche Hazard in San Juan County, Colorado* (Ref. 1). The nearest historic avalanche described was the Idaho Gulch path that destroyed bleachers in the town ball park and covered the highway in 1913-14. A historic photo by William Henry Jackson taken in 1901 Shows the location of the bleachers about 2300 feet east of the site. Table 9 in Ref. 1 lists no avalanche occurrences for or near the site.

Figure 5 shows the site location on the San Juan County Avalanche Atlas (Ref. 2). Path #14 named the “Blue Ribbon” shown on this map does not show the avalanche runout limits. The Atlas does not list any historic avalanche occurrences in this path. Figure 6 shows the site on the 1976 INSTAAR avalanche map. The site is located at the boundary of the avalanche path. The large scale of the INSTAAR map (1:24,000) was intended for planning purposes and is not suitable for evaluating individual parcels.

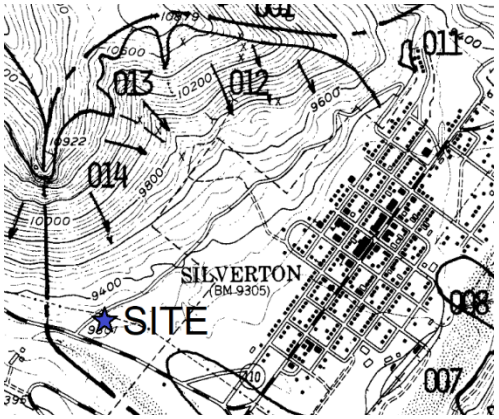

Figure 5 – San Juan County Avalanche Map

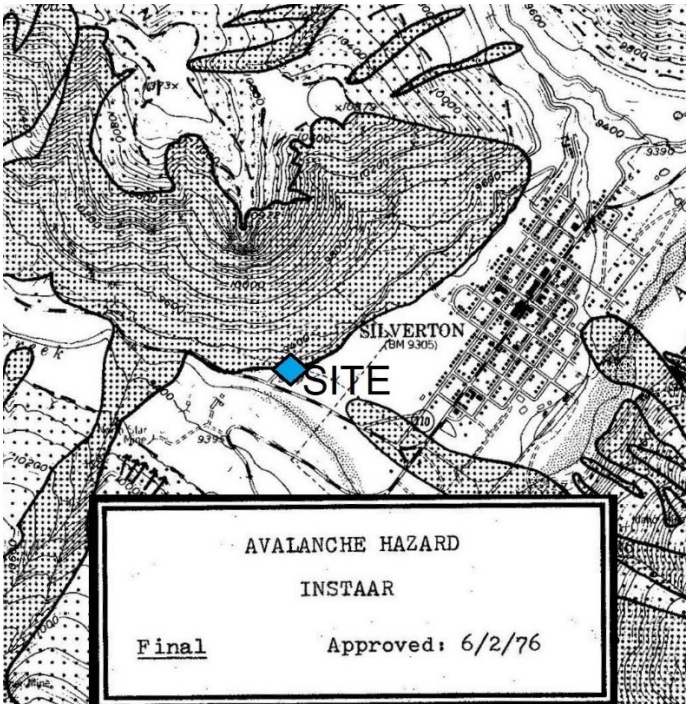

Figure 6 – 1976 INSTAAR Avalanche Map

According to long-time San Juan County resident and 48-year Road and Bridge worker, Louis Girodo, no avalanches have reached the Shrine road near the site during his career. Mr. Girodo recalled an avalanche in 1975 that ran 150 to 200-yards past the Shrine Road northeast of the Shrine.

6. Snow Climate

The site is located in the northern San Juan Mountains. The region is characterized by a high elevation, cold, high solar radiation, relatively low snowfall continental snow climate. This typical snowpack is widely known for its characteristic structure with a shallow cold snowpack and development of early season persistent weak layers that can last throughout the winter and spring. The weak layers can become overloaded by snow slabs that form during large storms and wind events, resulting in widespread avalanche activity. Spring warm-up periods often produce wet avalanches. Snowfall is affected by orographic precipitation, resulting in variable precipitation based on terrain, elevations and wind directions.

Long-term weather records are available from a COOP weather station in Silverton and SNOTEL stations on Red Mountain Pass, Mineral and Molas Pass. In addition, the Center for Snow and Avalanche Studies has weather instrumentation at three sites near Red Mountain Pass, including a ridgetop anemometer at the Putney weather station. Selected weather and climate data are presented in Appendix A.

7. Terrain

Figure 7 shows a slope angle and topographic map of the avalanche terrain derived from LiDAR data. The planned building sites are located near elevation 9310 feet below steep slopes on the south side of Anvil Mountain. The San Juan Avalanche Atlas (Ref. 2) identifies the avalanche path as the Blue Ribbon. The path has a broad convex 38-degree SSE-facing starting zone[3] between elevations 10,000 and 10,300 feet. Rock outcrops, subtle ridges and vegetation create several separate release areas totaling about ?-acres, all below treeline. All starting zones can release during the design-magnitude avalanche. Prevailing winds can cause minor cross-loading in starting zones. However, there is a very limited source (fetch) area due to terrain steepness upwind.

The avalanche track[4] is also convex with an average slope of about 30-degrees favorable for entrainment of additional snow and debris. There are subtle ridges that will cause some concentration of flows in the track, resulting in variations in flow thicknesses above the site.

The runout zone[5] begins on steep uneven terrain near elevation 9500 feet. The runout zone has much more variable terrain including channels and ridges that will deflect and concentrate avalanche flows as they decelerate. A distinctive ridge north of Lot 32 has channels on either site that will concentrate flows towards the west side of Lot 32 and between Lots 1 and 32.

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[3] The *Starting Zone* of an avalanche is the area where snow releases, accelerates and increases in mass.
[4] The *Track* of an avalanche is the area where maximum velocity and mass are attained.
[5] The *Runout Zone* of an avalanche is the area where deceleration occurs and the avalanche stops.

The total vertical elevation drop of the path is about 1000 feet and the average slope angle from the starting zone to the site (alpha angle) is 30-degrees.

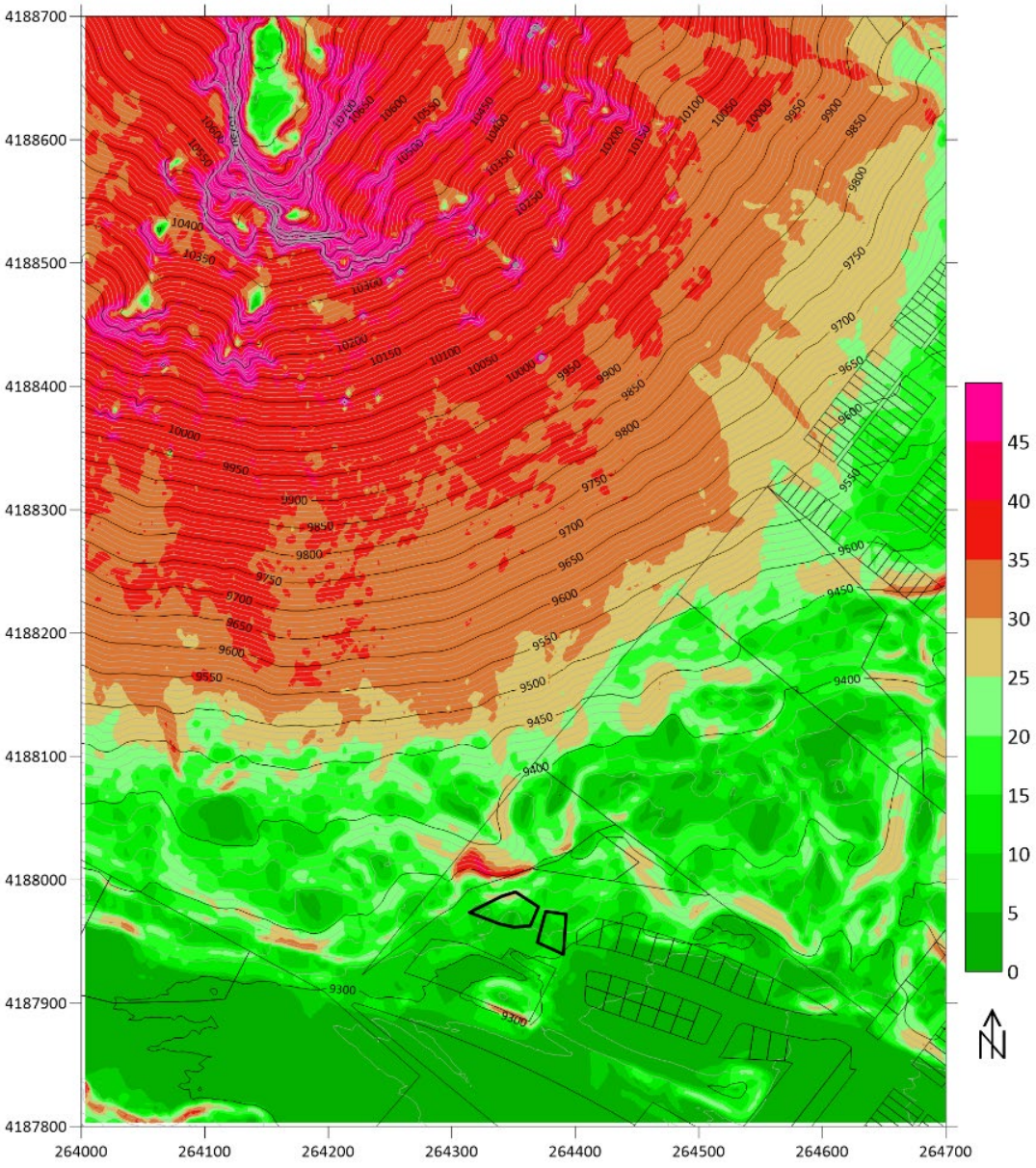


Figure 7 – LiDAR Slope Angle Map

Figure 8 shows a slope aspect map from LiDAR data. The south-facing aspect of the terrain will reduce snowpack depths compared to northerly aspects and result in less faceting. The combined effects of slope aspect, terrain convexity and shallow snow

depths reduce the frequency and magnitudes of avalanches compared to avalanche paths in this climate with similar fall heights and slope angles.

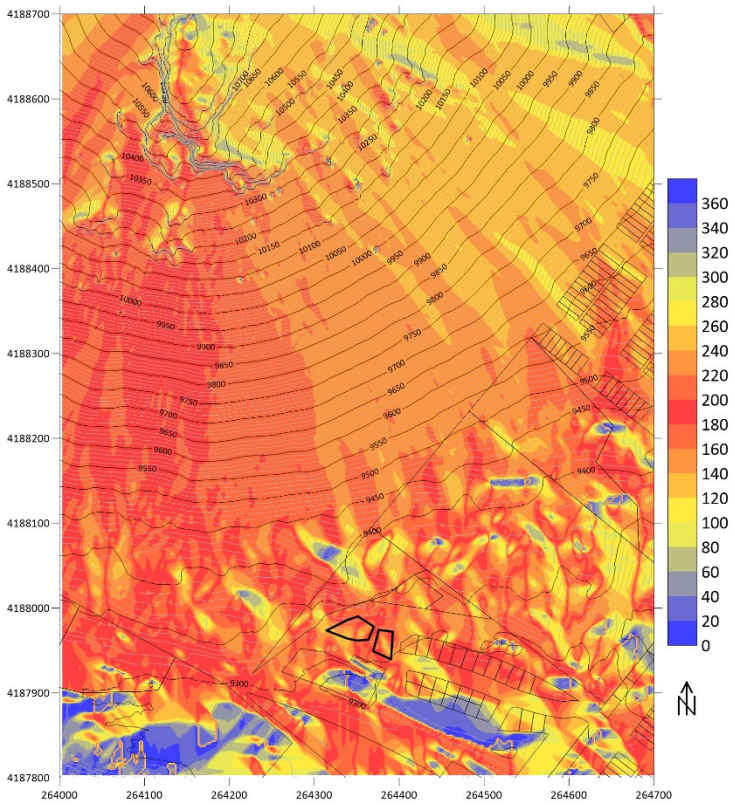


Figure 8 – LiDAR Slope Aspect Map

8. Vegetative Indicators

The spruce, fir and aspen forests at the site provide vegetative indicators for historic and undocumented avalanches, including lateral and vertical extents. Figure 9 shows a 1998 Google Earth image of the site. Figure 10 shows a LiDAR map that indicates approximate canopy height. This map was derived by subtracting ground reflections from unclassified reflections. Much of the forest near the site has been disturbed by historic and recent development. Aspens are the dominant tree species near and above the site. Aspens are a pioneer species with typical life-span of 100-years, so they are of limited use in evaluating long return period avalanches. The largest spruce trees near the site are about 15-inches in diameters and estimated to be about 100-years old, based on tree rings from nearby sawn stumps. None of the trees observed below Shrine Road exhibited obvious signs of avalanche damage. Tree damage above Shrine Road was relatively minor and limited to heights of less than 7-feet. Photos of trees and vegetation are presented in Appendix C.

Figure 9 – Site on 1998 Google Earth Image

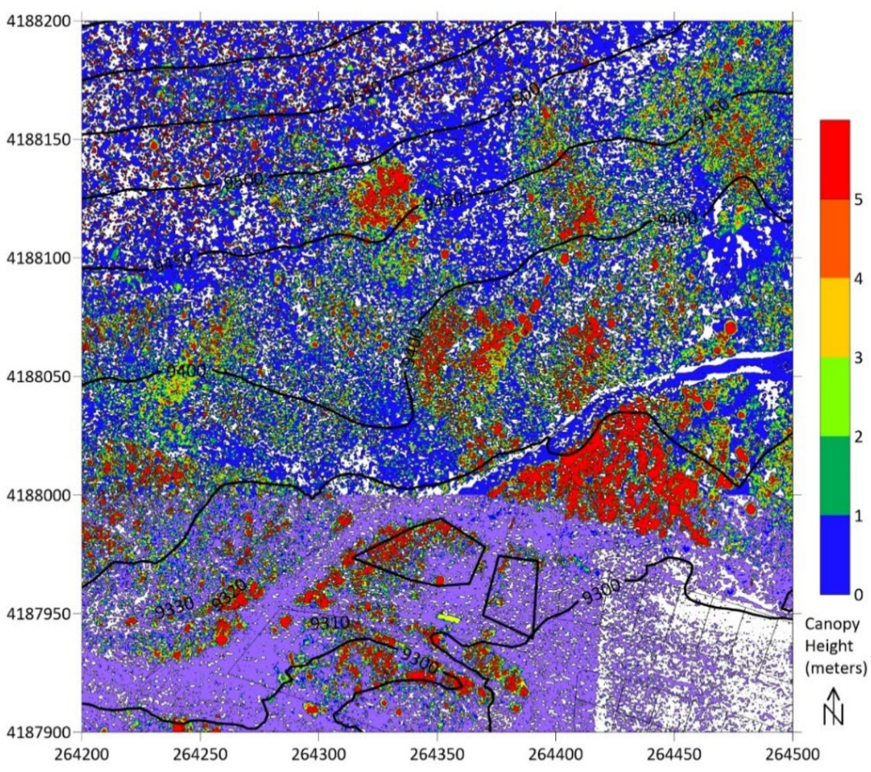


Figure 10 – LiDAR Canopy Height Map
(heavy contour lines 50-ft. intervals)

9. Avalanche Dynamics Modeling

We used the Swiss avalanche dynamics program RAMMS Release 1.8.0 to evaluate flow directions, thickness and velocities for the dense-flowing core of the design-magnitude avalanche in 3-dimensional terrain. Figure 11 shows representative model results for the maximum flow heights for an approximate 100-year average return period avalanche. The design-magnitude 100-year avalanche is highly unlikely to reach either building site. Figure 12 shows the approximate runout limits of a 300-year avalanche. The model is not calibrated or intended for off-site evaluations.

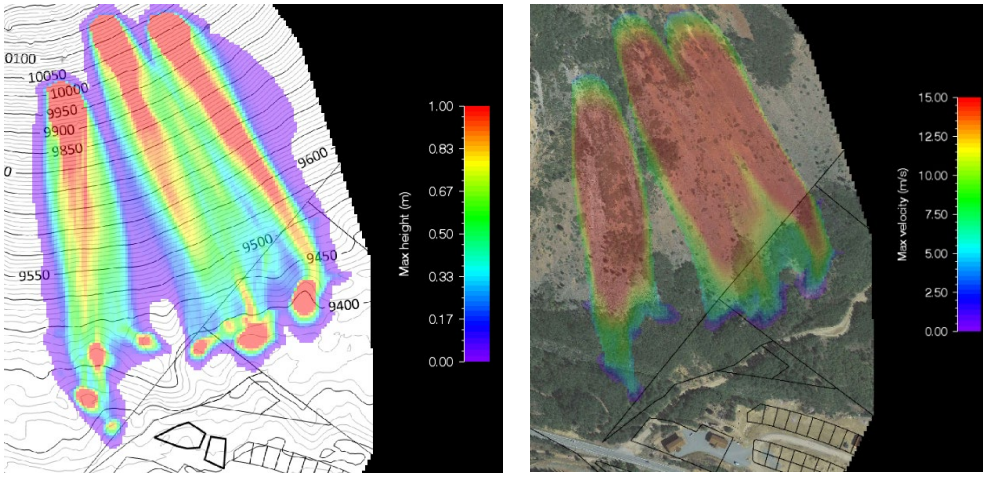


Figure 11 – RAMMS Approximate 100-year Avalanche Flow Heights and Velocities

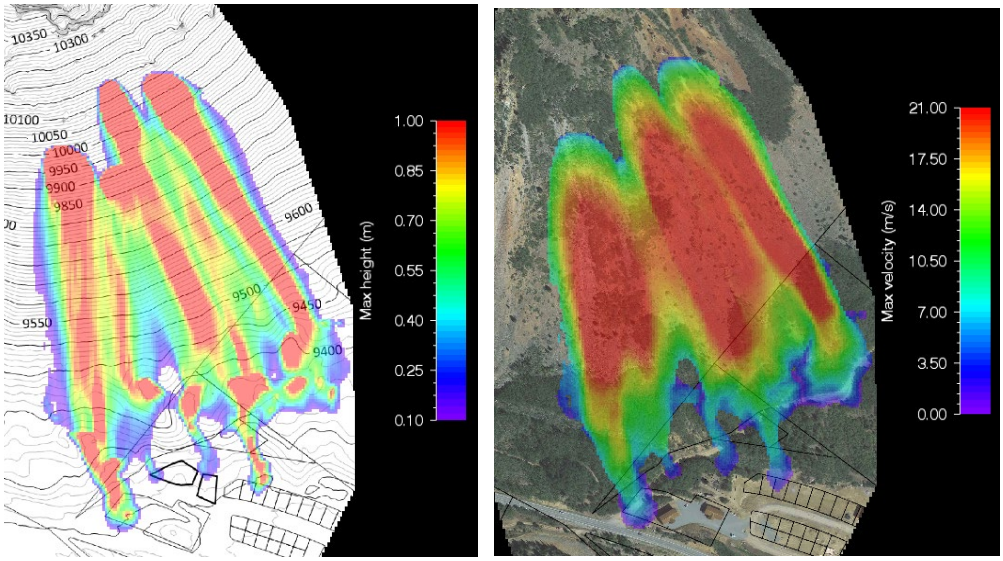


Figure 12 – RAMMS Approximate 300-year Avalanche Flow Heights and Velocities

Calibration for the RAMMS model was based on historic runouts, vegetation trim lines, and our experience with other avalanches in Colorado, including well-documented historic avalanches. Model assumptions, parameters and results are presented in Appendix B.

10. Findings

Based on the methods described in this report, we developed an Avalanche Hazard Map of the site (Figure 13). Each method was weighted based on our relative confidence in the method. The both Lots 1 and 32 lie outside of the Red (High) and Blue (Moderate) Avalanche Hazard Zones as defined in the Legend. Based on the Silverton Avalanche Ordinance 2005-02, no avalanche mitigation is required.

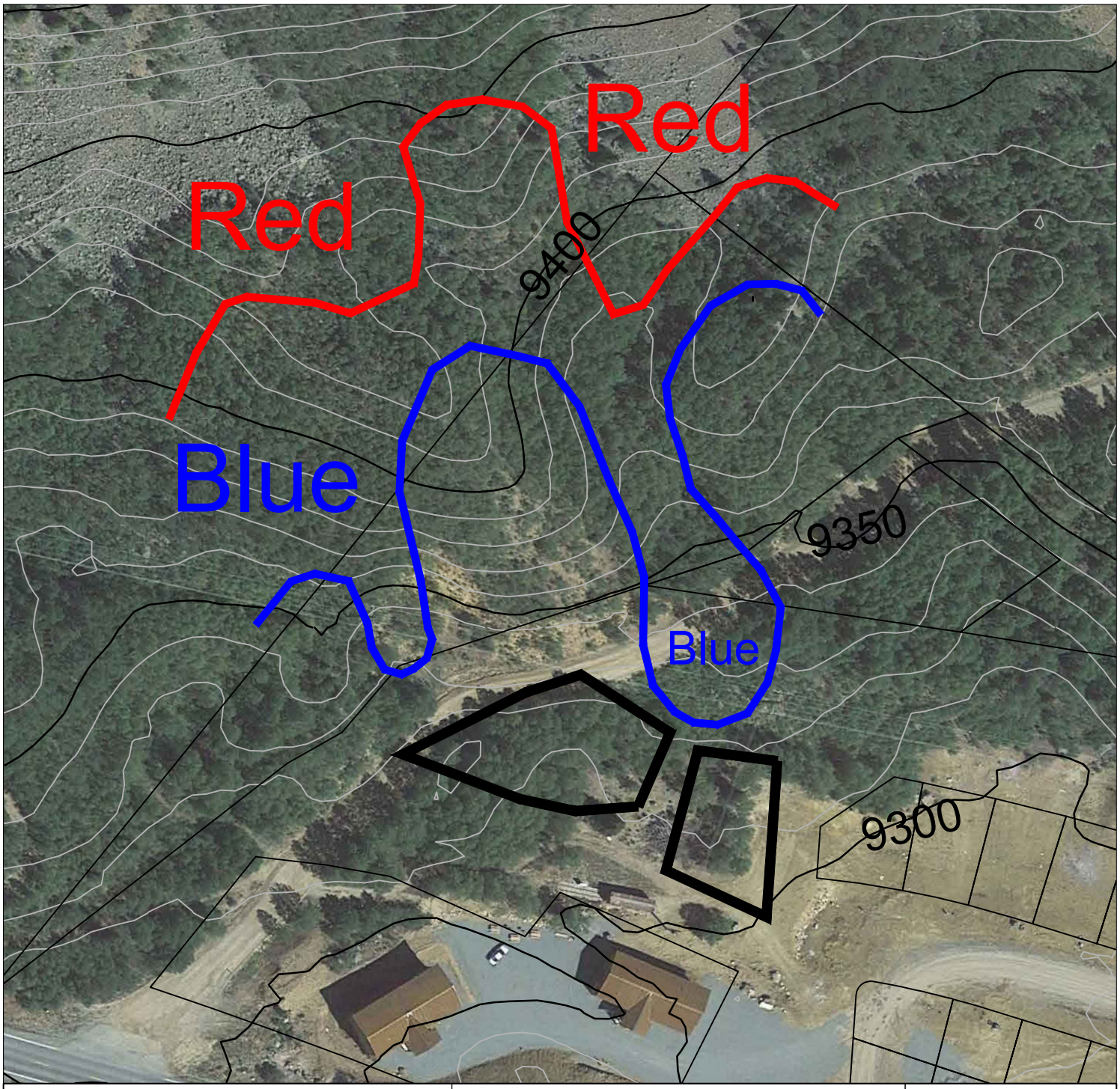
11. Recommendations

While the entire site lies outside of the 300-year avalanche runout limits, lower probability avalanches are possible. Due to the potential for large numbers of people to be exposed in a multi-family development, we recommend the following:

1. The planned buildings should be located as far from the Blue Zone as practical.
2. Windows and doors on walls facing the avalanche (north side) should be minimized.
3. Outdoor living spaces, especially hot tubs and heated outdoor spaces, should be placed in protected areas away from the avalanche-facing side of the building.

12. References

1. *Century of Struggle Against Snow: A History of Avalanche Hazard in San Juan County, Colorado*, prepared by Betsy R. Armstrong, Institute of Arctic and Alpine Research, for San Juan County in 1976, published as Occasional Paper No. 18 by INSTAAR "Overall Hazard Map", prepared by INSTAAR for San Juan County in 1976.
2. *Avalanche Hazard Map, San Juan County*, prepared by Rebecca Summer and Margaret Squier, INSTAAR (Institute of Arctic and Alpine Research), Boulder, Colorado, for San Juan County in 1976.
3. *Avalanche Atlas, San Juan County, Colorado*, prepared by Len Miller, Betsy R. Armstrong and Richard L. Armstrong, Institute of Arctic and Alpine Research, for San Juan County in 1976, published as Occasional Paper No. 17 by INSTAAR.
4. *Phone Interview with Louis Girodo,* June 9, 2025.



NOTES:

1. Site boundary based on Site Plan by SGM dated January 22, 2025.
2. Topography based on USGS National Map LiDAR flown in 2018. Elevations in feet.
3. 2019 Image from Google Earth.
4. Mapping subject to limitations described in accompanying report.

LEGEND

Red Zone (High potential hazard).
The Red zone is an area reached by either frequent or powerful avalanches. It is an area reached by an avalanche with a 30- year or less avalanche return period, OR, if it produces an impact pressure on a large, flat, rigid surface normal to the flow direction of 30 kPa (630 psf) or more.

Blue Zone (Moderate potential hazard).
The Blue zone is an area reached avalanches with 30-300 year return periods and in which the design avalanche produces impact pressures of less than 30 kPa (630 psf). Both the return period and the impact conditions must be satisfied in order to qualify as a Blue zone.

0 (IN FEET) 100'
Contour Interval 10 ft.

Avalanche Hazard Map

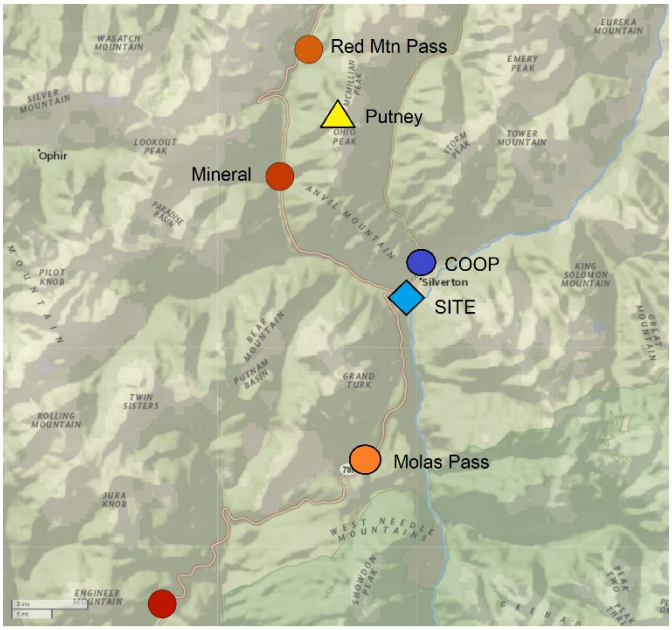
Lots 1 & 31, Anvil Subdivision

Silverton, Colorado

Wilbur Engineering, Inc.
June 9, 2025

Figure
13

Appendix A
Weather and Climate



Regional Map with Weather Stations

SILVERTON, COLORADO (057656)

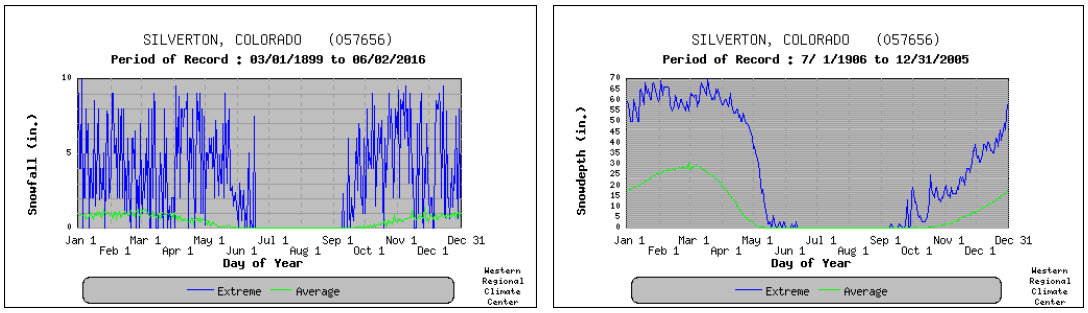
Period of Record Monthly Climate Summary

Period of Record : 7/ 1/1906 to 12/31/2005

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	34.0	36.6	40.6	47.3	57.6	67.9	73.1	70.5	64.7	55.1	43.2	35.1	52.2
Average Min. Temperature (F)	-1.9	1.0	8.1	18.5	26.4	31.9	37.9	37.2	30.3	22.0	9.5	0.2	18.4
Average Total Precipitation (in.)	1.68	1.75	2.30	1.72	1.46	1.39	2.72	3.10	2.81	2.34	1.49	1.73	24.50
Average Total SnowFall (in.)	25.8	25.3	28.4	17.3	4.3	0.3	0.0	0.0	0.9	8.5	20.0	24.0	154.8
Average Snow Depth (in.)	21	27	26	11	0	0	0	0	0	1	4	12	9

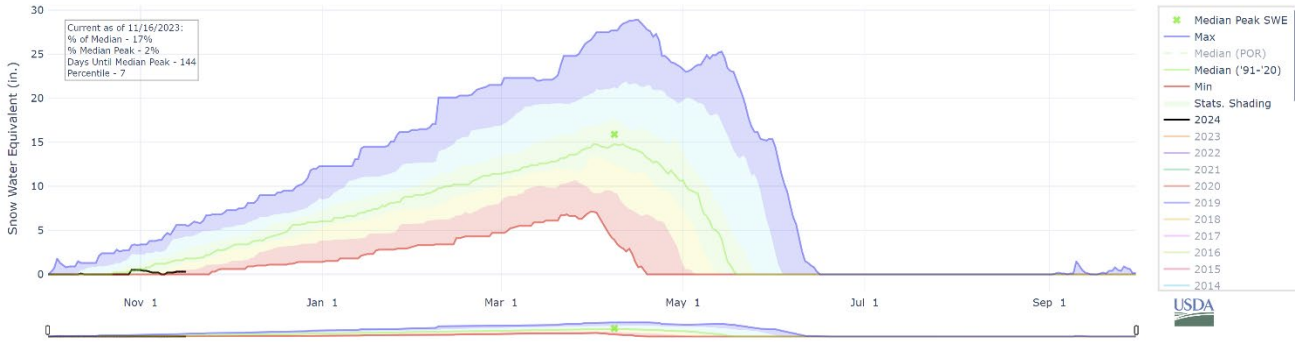
Percent of possible observations for period of record.
Max. Temp.: 94.1% Min. Temp.: 93.9% Precipitation: 95% Snowfall: 95.2% Snow Depth: 85.8%
Check Station Metadata or Metadata graphics for more detail about data completeness.

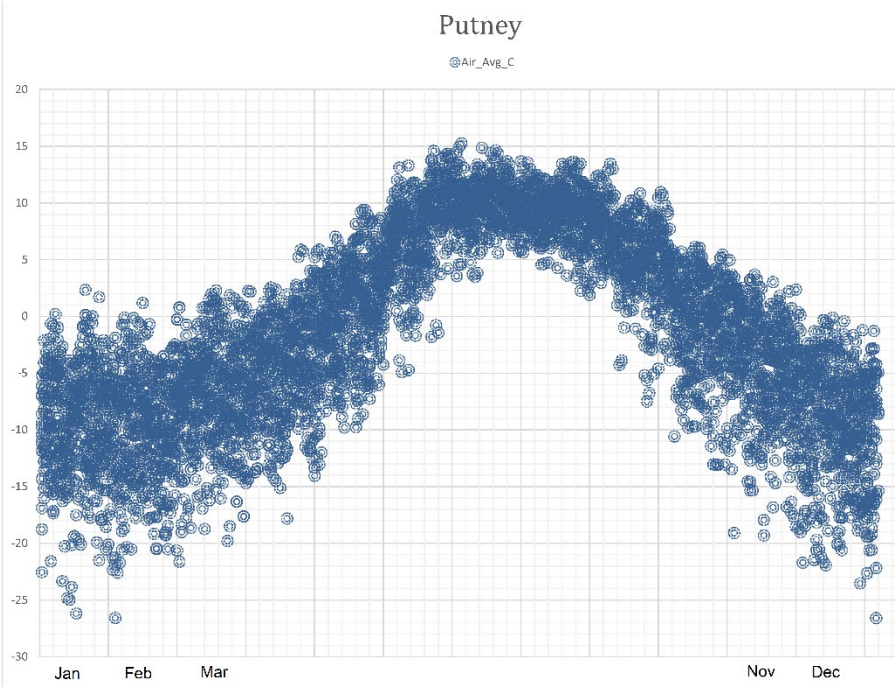
Western Regional Climate Center, wrcc@dri.edu



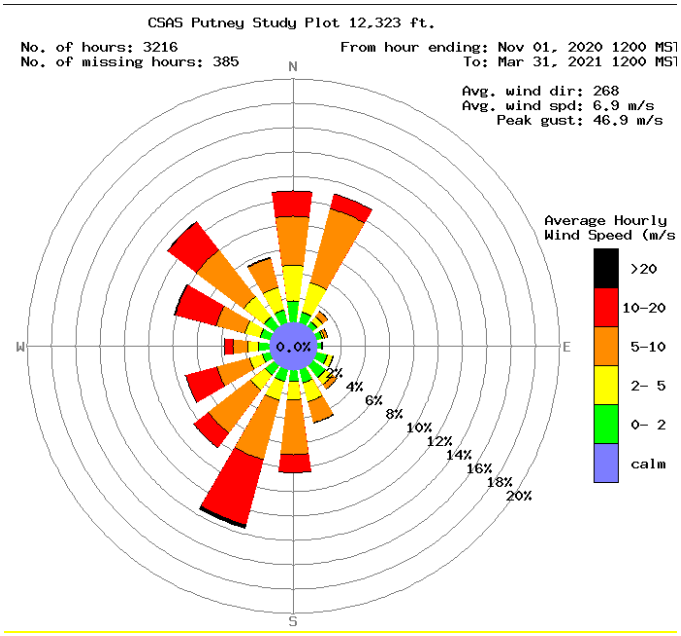
Silverton Coop Snow Height and 24-hour Snowfall Data

Mineral SNOTEL

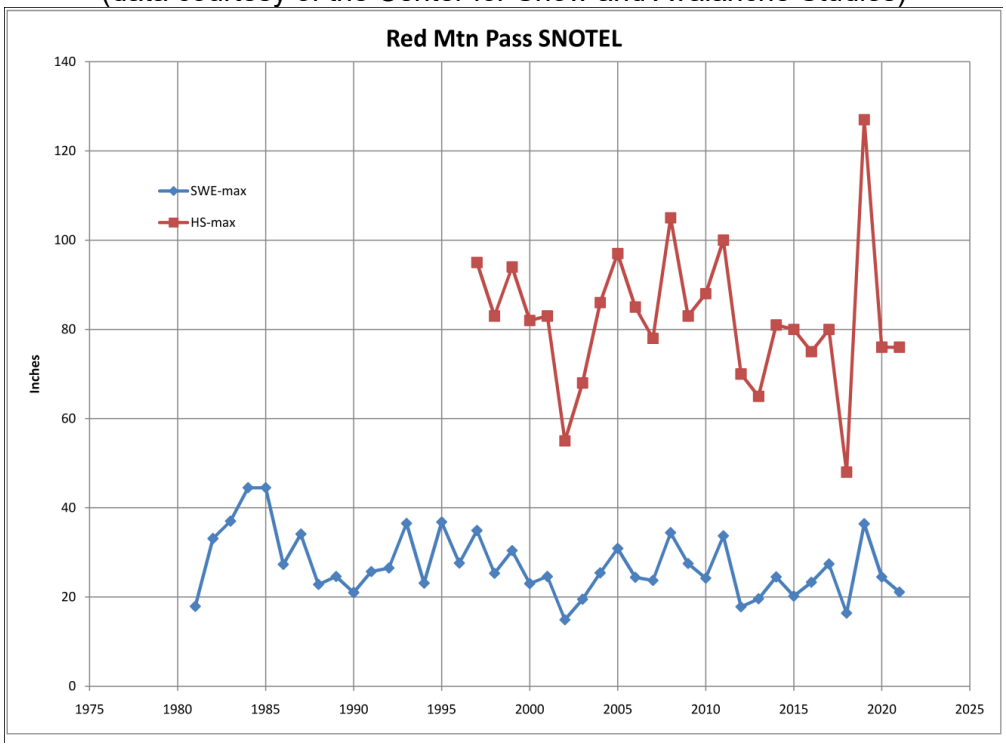


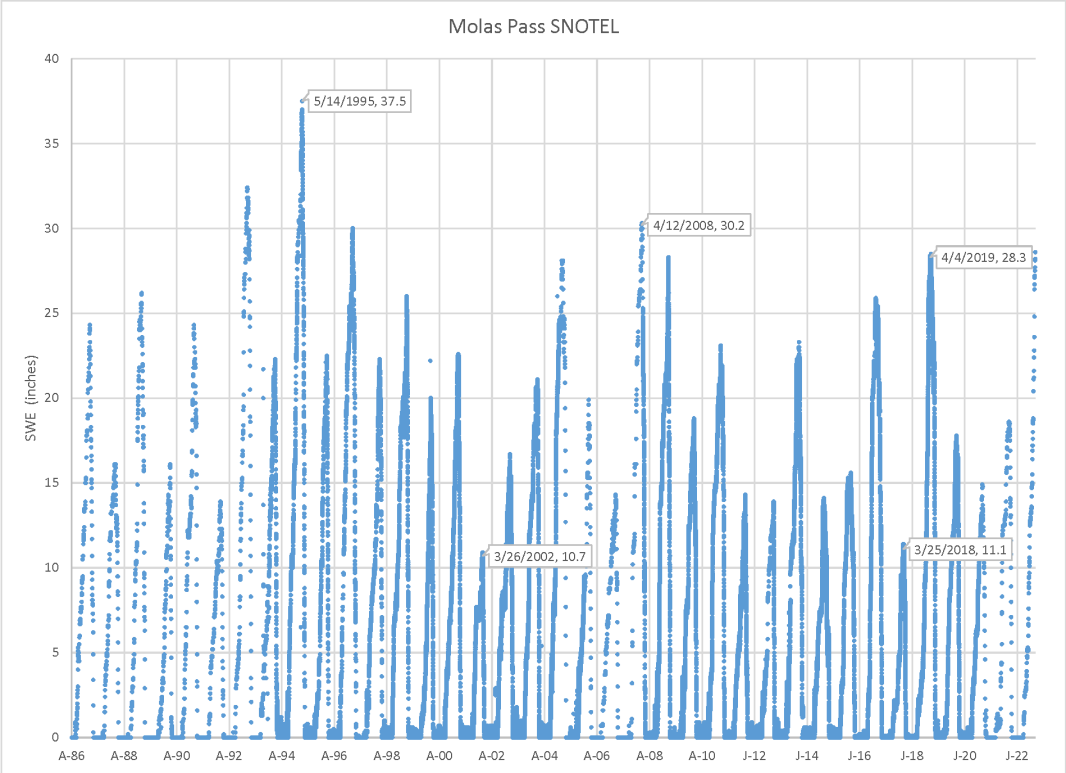


Putney Air Temperatures
(data courtesy of the Center for Snow and Avalanche Studies)



Putney Wind Rose
(data courtesy of the Center for Snow and Avalanche Studies)





Molas SNOTEL Snow Water Equivalent
(El. 3200 meters)

Appendix B

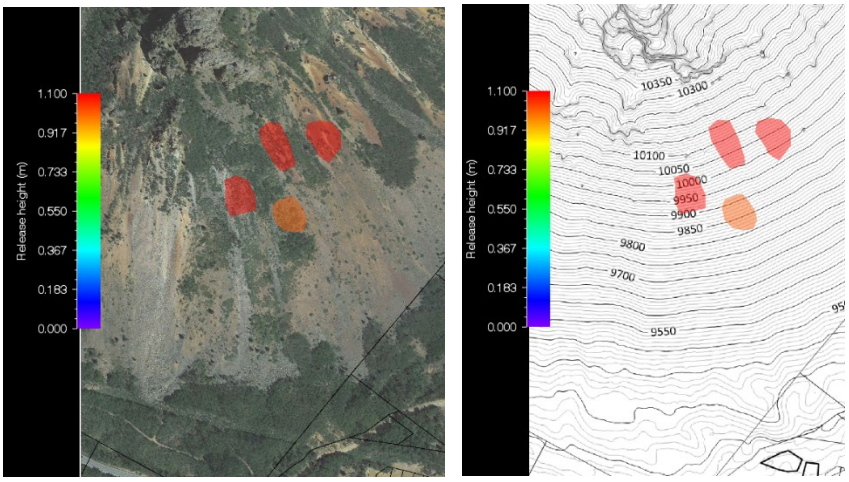
RAMMS Parameters & Results

*** Important Note: ***

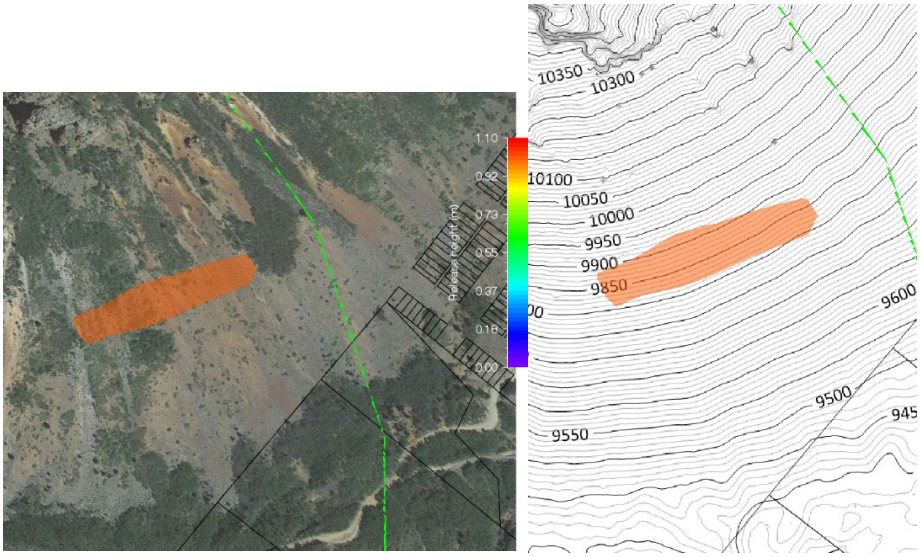
Interpretation of avalanche dynamics model results requires an understanding of the model assumptions, simplifications and limitations of the underlying equations of motion. The models do not accurately show wet avalanche runouts, flow heights or impact pressures, nor the variations in avalanche properties with depth, including density and velocity. Model results should be interpreted with other methods of assessment.

		Release			Friction			C	Comments
	res.	name	ht. (m)	vol. (m3)	name	mu	xi	(Pa)	
run1	3	R1	0.8	31,600	M100	0.20	2500	0	slope-based rel
run2	3	R2	0.8	15,600	S100	0.25	2000	0	2-part rel, incr frict
run3	3	R3	0.8	4,600	T100	0.28	1500	0	7-part veg-based rel, incr frict
run4	3	R4	1.0	7,200	T100	0.28	1500	0	3-part veg-slope based rel
run5	3	R4	1.3	9,400	T100	0.28	1500	0	incr rel ht
run6	3	R4,a	1.0-1.3	11,500	T100	0.28	1500	0	add rel 4a
run6a	3	R4,a	1.0-1.1	11,500	S100	0.25	2000	0	decr frict, rel ht
run7	3	R4,a	1.0-1.3	11,500	S300	0.3	2000	0	300-yr friction
run8	3	R5	1.1-1.3	15,400	S300	0.3	2000	0	larger rel, 300-yr friction
run9	3	R6	1.0	10,200	T100	0.28	1500	0	lwr conn rel

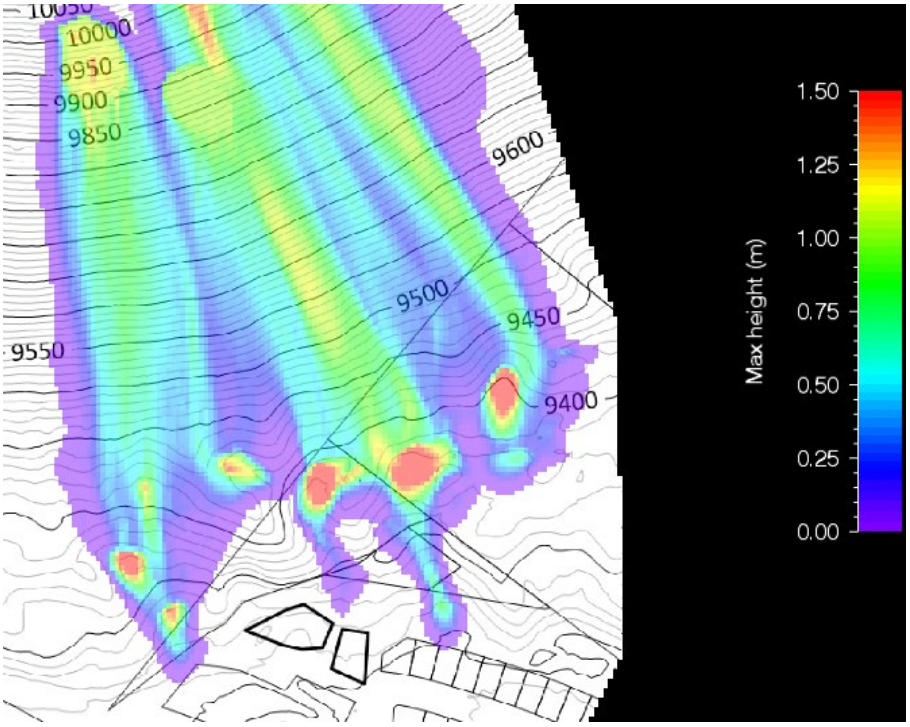
Release area 5



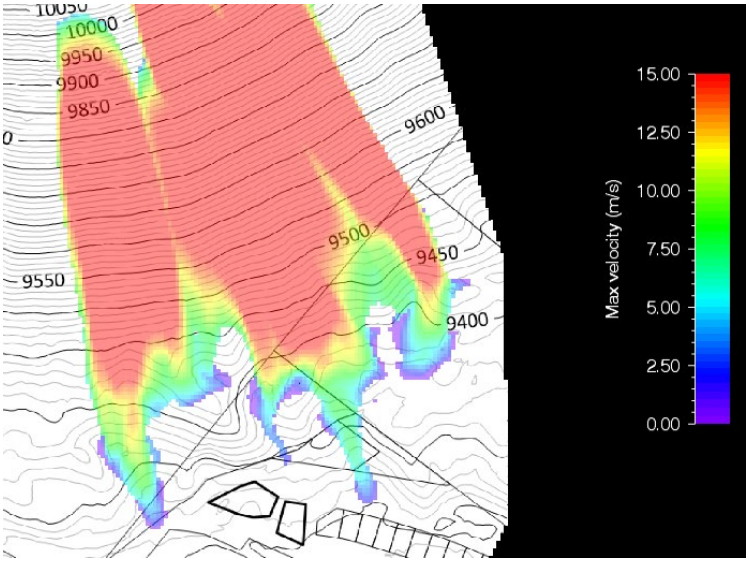
Release areas 4, 4a



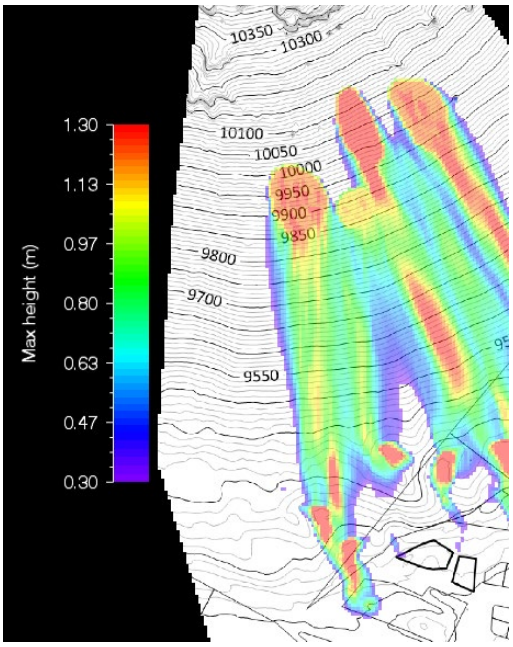
Release area 6



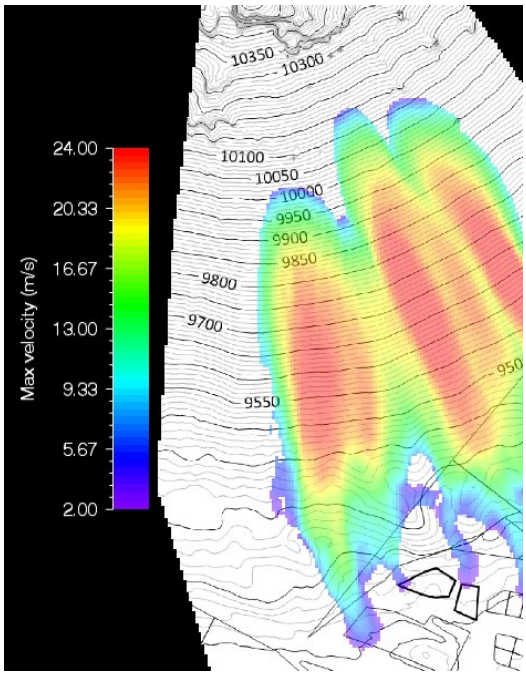
Run 6a – Maximum core heights



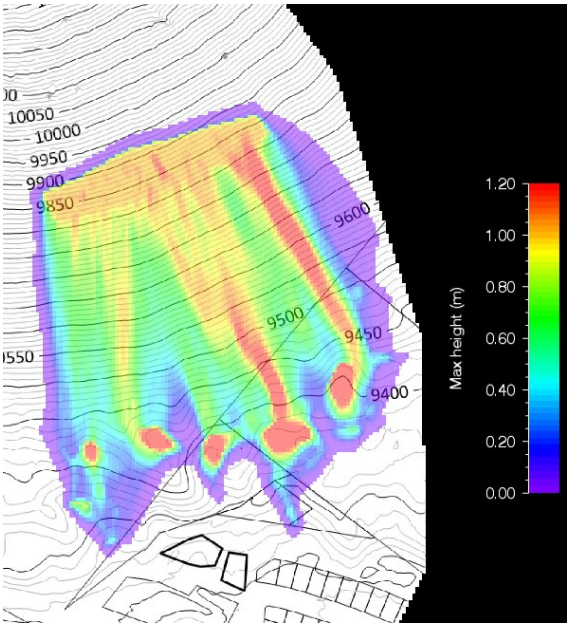
Run 6a – Maximum Core Velocities



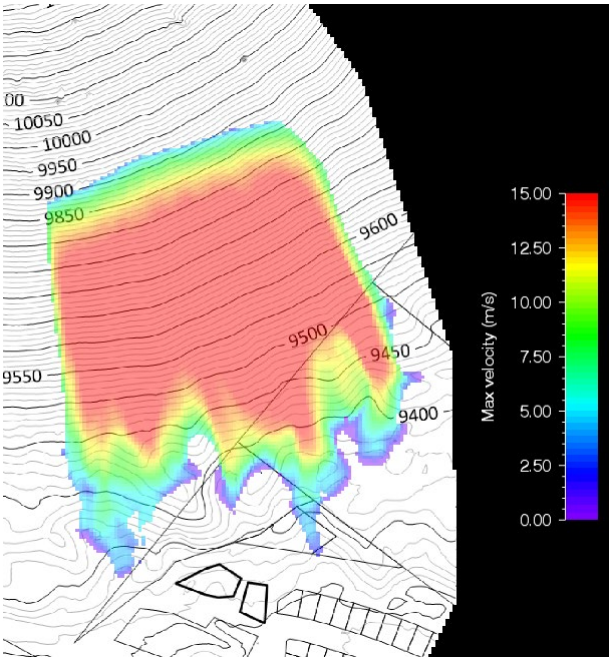
Run 8 – Maximum Core Flow Height



Run 8 – Maximum Core velocities

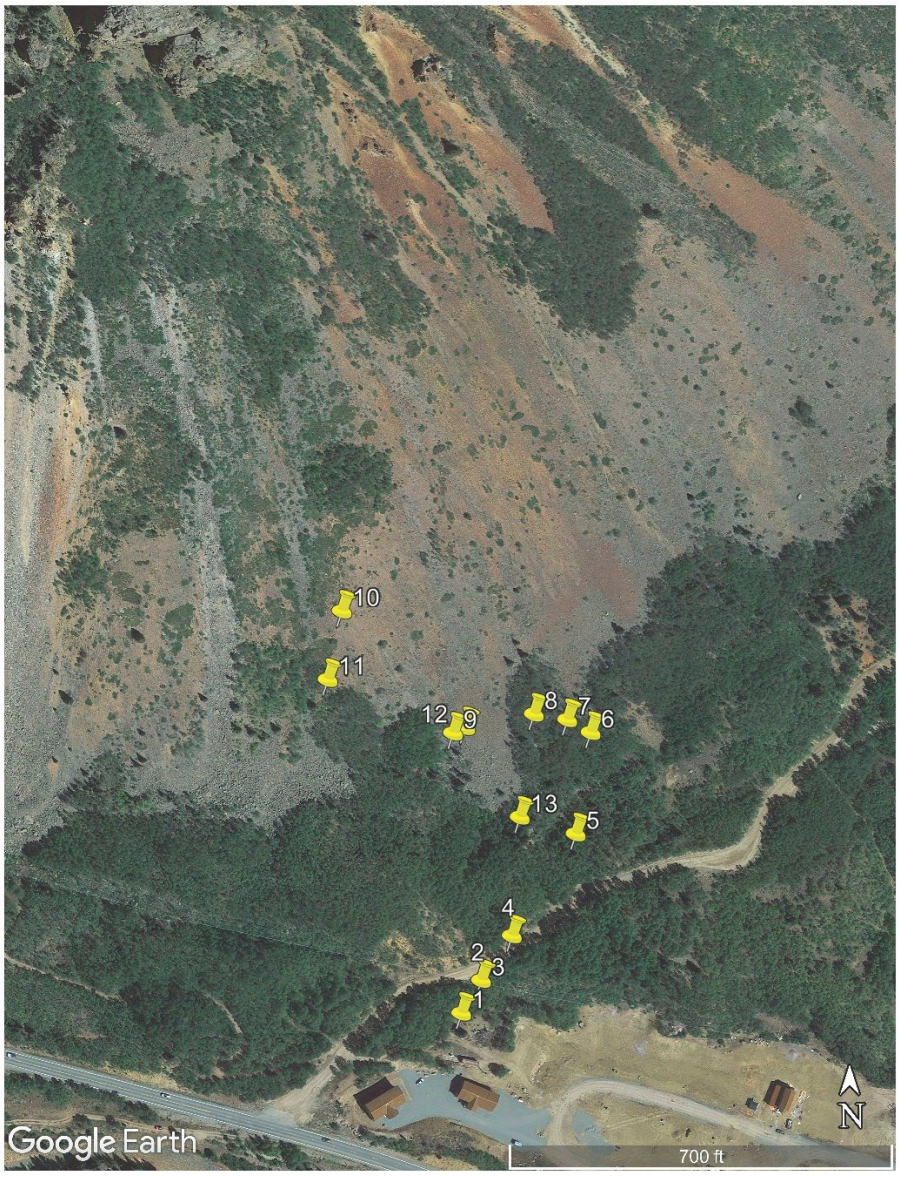


Run 9 – Maximum Core Flow Height



Run 9 – Maximum Core Velocities

Appendix C – Site Photos



All photos by C. Wilbur, June 5, 2025

Appendix C – Site Photos

All photos by C. Wilbur, June 4, 2025

		lat	lon	dbh	descr
no.	species	37 48	107 40	(in)	
1	spruce	31.34	36.74	9.2	no dmg; steel bar
2	spruce	31.93	36.29	8	sawn; tight concentric rings; no dmg; age: 65
3	aspen	32.02	36.17	14	sawn; twin;age 60-80
4	spruce	32.73	35.59	10	sawn; tight concentric rings; no dmg; age: 65
5	spruce	34.56	34.14	8.6	split near base; rock adj, RF?
6	spruce	36.38	33.8	15.6	thin branches 2'-4'
7	spruce	36.61	34.33	9.6	split 4' up; pistol
8	fir	36.71	35.09	13.1	no dmg
9	spruce	36.37	36.93	7.0	2 spruce; no dmg
10	aspen	38.56	39.46	n/a	100-yr old down, align
11	spruce	37.33	39.78	13.1	no dmg or minor low branch dmg
12	spruce	36.47	36.65	6.7	branch dmg 0-7'
13	spruce	34.86	35.41	11.5	2 w/ bldr; no dmg; knoll/moraine

1

2

4

5

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13