



NOTICE OF THE REGULAR MEETING OF THE GENERAL ASSEMBLY

TOWN OF OPHIR, CO 81426

TUESDAY 7:00 PM, January 17th, 2022

OPHIR TOWN HALL 36 PORPHYRY ST.

[Join Zoom Meeting](#)

Meeting ID: 867 0143 8435 Passcode: 373146

AGENDA

1. CALL TO ORDER
2. ADOPTION & SIGNATURE OF DECEMBER 21, 2022 MEETING MINUTES
3. APPROVAL OF AGENDA
4. BUSINESS ITEMS
 - a. Public Hearing-Rezoning Application
 - i. Project Name: Cornwall Property, Applicant: Joseph Waller
 - ii. Project Summary: The evaluation of avalanche hazard and mapping within lots 1-10, block two, Article 804 overlay adjustment, Appendix C Town of Ophir Hazards Map.
 - iii. Action Sought: Removal of lots 1-10, block two from the high hazard area designation on the Town of Ophir Hazards Map and retaining underlying residential zoning.
 - b. Introduction and First Reading of Ordinance 2023-01 Amending Town of Ophir Land Use Code Appendix C- Town of Ophir Hazards Map To Remove Lots 1-10, Block 2 From the Hazard Area
 - c. Executive Session (if needed) for conference with Town Attorney for the local public body for the purpose of receiving legal advice on specific legal questions, as authorized by C.R.S. 24-6-402(4)(b).
 - d. Election of Town Staff
 - i. Nominations
 1. Mayor-Mason Osgood
 2. Clerk-Lisa Rutledge
 3. Mayor Pro-Tem-Jacey DePriest
 4. Treasurer-Cindy Wyszynski
5. STAFF REPORTS
 - a. Red Cross Shelter Designation
6. NEW BUSINESS

WWW.TOWN-OPHIR.CO.GOV

7. ADJOURN

MINUTES OF THE REGULAR MEETING OF THE GENERAL ASSEMBLY

TOWN OF OPHIR, CO 81426

WEDNESDAY, December 21st, 2022 7:00 PM

REMOTE MEETING VIA ZOOM PLATFORM

CALL TO ORDER

(TIME: 7:08 PM)

Voting Members: Mason Osgood, Judah Kuper, Lisa Rutledge, Eric Beermann, Phil Hayden, Leigh Sullivan, Emma Christensen, Chris Dickson, Kim Wheels, John Humphries, Jacey Depriest, Janice Gerona, Elias Bahou

Non-Voting Members: John Wontrobski, Cindy Wyszynski, Jonathan Cooper, Joseph Waller

ADOPTION & SIGNATURE OF November 15th, 2022 MEETING MINUTES

Judah Kuper motions to approve and adopt the November 15th, 2022 Ophir GA meeting minutes, Mason Osgood seconds.

In Favor (Aye): Mason Osgood, Judah Kuper, Eric Beermann, Phil Hayden, Leigh Sullivan, Emma Christensen, Chris Dickson, Kim Wheels, John Humphries, Jacey Depriest, Janice Gerona, Elias Bahou

Not in Favor (Nay): None

Abstain: Lisa Rutledge

Motion to approve November 15th 2022 meeting minutes passes unanimously

APPROVAL OF AGENDA

Judah Kuper motions to approve the December 21st, 2022 Ophir GA Agenda, Mason Osgood seconds.

In Favor (Aye): Mason Osgood, Judah Kuper, Lisa Rutledge, Eric Beermann, Phil Hayden, Leigh Sullivan, Emma Christensen, Chris Dickson, Kim Wheels, John Humphries, Jacey Depriest, Janice Gerona, Elias Bahou

Not in Favor (Nay): None

Motion to approve the agenda passes unanimously

BUSINESS ITEMS

4a Consideration of Request by Joseph Waller to Review Attorney Invoices In Connection with the Cost Pass Through Agreement Entered Into with the Cornwall-Whittaker Application to Remove Lots 1-10, Block 2, Ophir Townsite from the High Hazard Avalanche Zone District, and Determination of Whether or Not to Partially-Waive Attorney-Client Privilege for Such Review

John Wontrobski introduces the item, discussing the history of the pass-through agreement with the Cornwall Whitaker rezone application. John also discusses how the Town of Ophir agreed to

apply the application fee of the Cornwall Whitaker lots to the pass-through agreement, which significantly reduced the cost to the applicant.

Steven Johnson (Town of Ophir Attorney) discusses specifics of the request by the applicant to review the invoices from the pass-through bill. He does not believe the applicant can argue the reasonableness of the fees, as a courtesy this item has been brought to the GA to discuss this item. Allowing the applicant to review the invoices would potentially waive attorney-client privilege. We have discussed the possibility of allowing the applicant to view and not copy the invoices, though no agreement yet. He advises against any reviewing of the invoices unless the applicants would not constitute a waiver of attorney client privileges, they could potentially cause issues for liability etc. Mr. Johnson hints to the threat of litigation from the applicant on this matter as well.

Judah Kuper comments on the reasonableness of the pass-through agreement bill speaking to how many hours P&Z has put in for this application. He thinks it is reasonable to apply the application fee to the pass through bill, and that it is reasonable for Joe Waller to want to see the unredacted bill.

Phil Hayden motions to authorize the town manager to provide Joe Waller to view but not copy unredacted invoices from the town attorney provided that the applicant agrees the viewing does not waive attorney-client privilege and does not constitute overall attorney client privilege for the Cornwall-Whitaker rezone application, Judah Kuper seconds

In Favor (Aye): Mason Osgood, Judah Kuper, Lisa Rutledge, Eric Beermann, Phil Hayden, Leigh Sullivan, Emma Christensen, Chris Dickson, Kim Wheels, John Humphries, Jacey Depriest

Not in Favor (Nay): None

Motion to authorize partial waiver of attorney-client privilege for the Cornwall Whitaker application pass through agreement passes.

4b First Reading of Resolution 2022-05 establishing the 2023 Town of Ophir Budget

Mason Osgood motions to approve Resolution 2022-05 establishing the 2023 Town of Ophir Budget, Judah Kuper seconds.

In Favor (Aye): Mason Osgood, Judah Kuper, Lisa Rutledge, Eric Beermann, Phil Hayden, Leigh Sullivan, Emma Christensen, Chris Dickson, Kim Wheels, John Humphries, Jacey Depriest, Janice Gerona, Elias Bahou

Not in Favor (Nay): None

Motion to approve Resolution 2022-05 establishing the 2023 Town of Ophir Budget passes

4c Second Reading of Ordinance 2022-04 John Wontrobski Town Manager 2023-2024 Contract

Judah Kuper motions to approve Ordinance 2022-04 John Wontrobski Town Manager 2023-2024 Contract, Mason Osgood seconds

In Favor (Aye): Mason Osgood, Judah Kuper, Lisa Rutledge, Eric Beermann, Phil Hayden, Leigh Sullivan, Emma Christensen, Chris Dickson, Kim Wheels, John Humphries, Jacey Depriest, Janice Gerona, Elias Bahou

Not in Favor (Nay): None

Motion to approve Ordinance 2022-04 John Wontrobski Town Manager 2023-2024 contract passes

4d FAMILI paid medical leave program-join or decline?

Phil Hayden motions to opt out of the FAMILI paid medical leave program, Mason Osgood seconds

In Favor (Aye): Mason Osgood, Lisa Rutledge, Eric Beermann, Phil Hayden, Leigh Sullivan, Emma Christensen, Chris Dickson, Kim Wheels, John Humphries, Jacey Depriest, Janice Gerona, Elias Bahou

Not in Favor (Nay): None

Abstain: Judah Kuper

Motion to opt out of the FAMILI paid medical leave program passes

4e Notice of 2023 Ophir General Assembly Meeting Dates

Judah Kuper motions to approve the 2023 Ophir General Assembly Meeting Dates, Mason Osgood seconds

In Favor (Aye): Mason Osgood, Judah Kuper, Lisa Rutledge, Eric Beermann, Phil Hayden, Leigh Sullivan, Emma Christensen, Chris Dickson, Kim Wheels, John Humphries, Jacey Depriest, Janice Gerona, Elias Bahou

Not in Favor (Nay): None

Motion to approve the 2023 Ophir General Assembly Meeting Dates passes

4f Nominations for town staff and committee positions elections

i. Mayor

a. Kim Wheels motions to nominate Mason Osgood as Mayor, Janice Gerona seconds

ii. Mayor Pro Tem

a. Judah Kuper motions to nominate Jacey Depriest as Mayor Pro Tem, Lisa Rutledge seconds

iii. Treasurer

a. Mason Osgood motions to nominate Cindy Wyszynski as Treasurer, Lisa Rutledge seconds

iv. Clerk

a. Mason Osgood motions to nominate Lisa Rutledge as Clerk, Judah Kuper seconds

STAFF UPDATES

Mason Osgood (Mayor)-Participating in the ongoing SMC East End Master Plan, hopefully some upcoming ways to participate as a town. SMC approved to pave the Ophir county road to the exit of the highway to the post office.

Mason Osgood (Clerk)-Looking for a new clerk!

Cindy Wyszynski (Treasurer)- Working with our new CPA on our long-form audit.

Jacey Depriest (OEC)- Chapman Burn piles have started. We had little notice on that from the USFS. We reached out afterwards and inquired how long the burning would be, this could potentially be for months. We've been working with Judah and P&Z to update our lighting language to be in line with Dark Sky Communities. We are also preparing a couple presentations to the GA in 2023.

Kim Wheels comments on the ongoing burn piles and the disappointing response so far from the USFS. Eric Beermann also comments on how bad the smoke has been and its affects on his health. Mason Osgood agrees to draft letter expressing the Town of Ophir's disappointment with the burn pile process.

Judah Kuper (P&Z)- We are continuing to move forward with LUC revisions with the building code and energy code. First application for a building permit from Marsh/Crowell which have already been approved but we are going to review the one more time. No new project or anything else on our plate.

John Wontrobski (Manager)-There will be a Mtn Trip Avalanche rescue training class on Thursday December 29th, it is \$50 a person. It's mostly beacon practice, team search techniques etc. They offer this in return for using Ophir town hall.

NEW BUSINESS

None

ADJOURN

Having reached the end of the agenda, and with no new business presented, Mason Osgood declared the meeting adjourned at 8:54pm

Town Clerk, Mason Osgood

Date

Minutes prepared by Mason Osgood, Town Clerk

Audio recordings of all General Assembly Meetings are available to the public. Please contact the Town Clerk if you would like a copy of this month's audio of the meeting minutes.

To: Ophir General Assembly
From: John Wontrobski, Ophir Town Manager
RE: General Assembly Meeting- Tuesday, January 17, 2023
Date: December 19, 2023

2. Draft minutes of the December 21, 2022 General Assembly meeting are in the packet.

4a. At the September 14th Planning and Zoning Commission meeting, the Commission voted unanimously (4-0) to recommend to the General Assembly that a request by Joseph Waller, representing the Whitaker-Cornwall property owners of Lots 1-10, Block Two, to amend the Ophir Hazard Map to take those lots out of the high hazard Avalanche Zone, be denied. All the materials considered by P&Z are included in this month's GA packet, and the GA is also being asked to approve or deny the request, with the P&Z recommendation in mind. A reminder that this proceeding is considered quasi judicial in nature, meaning that all Town of Ophir Electors are required to weigh the request on the merits of the evidence presented at the GA public hearing (as a judge would), and not have any pre-judgements or biases that would taint the proceedings.

Staff Report. While updating Ophir's part in the 2023 San Miguel County All Hazards Mitigation Plan, TM discussed the possibility of Ophir's Maintenance Barn and/or Town Hall becoming an emergency shelter in the local Red Cross shelter inventory. The local Red Cross representative is Scott Pearson, who is available to do a survey of the Ophir facilities to see if they are suitable to be added to the local inventory list. If they are, the General Assembly will be asked to approve a Facility Use Agreement at a later date. At this point, the TM is requesting GA approval to continue working with the Red Cross to designate the Ophir facilities as Emergency Shelters.

Public Hearing Record

Town of Ophir

Application:

The evaluation of avalanche hazard and mapping within lots 1-10, block two, Article 804 overlay adjustment, Appendix C Town of Ophir Hazards Map. Seeking removal of lots 1-10, block two from the high hazard area designation on the Town of Ophir Hazards Map

Date: January 4, 2023

1. Motion of denial of Cornwall-Whittaker application to remove Lots 1-10, Block 2, Town of Ophir from the High Hazard Avalanche Zone District,
2. Contents of 7/7/22 Ophir Planning and Zoning Commission Public Hearing for Cornwall Whitaker request (includes original Land Use Code amendment application)
3. Additions to packet for 9/14/22 Ophir Planning and Zoning Commission continuation of Cornwall Whitaker Public hearing
4. 7/7/22 and 9/14/22 approved Ophir Planning and Zoning Commission meeting minutes
5. Additions from Applicant since 9/14/22 Ophir Planning and Zoning Commission meeting
6. Public Noticing for General Assembly Public Hearing-Cornwall Whitaker

PUBLIC COMMENT

7. Email from Mike Kuby with attachment, dated October 25, 2022
8. Presentation files from Joe Shults public comment during the 9/14/22 Ophir Planning and Zoning Commission meeting

I move that, based upon the application as amended and supplemented, testimony, evidence and public comments presented at public hearing on June 11, 2019, July 7, 2022, September 14, 2022 during the Ophir Planning and Zoning (P&Z) Commission as well as today's (January 17, 2023) Ophir General Assembly, that the Cornwall-Whittaker application to remove Lots 1-10, Block 2, Town of Ophir from the High Hazard Avalanche Zone District, be denied, for the following reasons:

Applicant has failed to demonstrate by the preponderance of the evidence compliance with at least three criteria for approval of a zone map amendment. Specifically, P&Z finds that Land Use Code subsection 1415.C, REVIEW STANDARDS FOR CODE AND MAP AMENDMENTS is not met, insofar as no material or substantial error in the existing zoning map has been substantiated by the Applicant. Figure 10 of the 1976 Natural Hazards in Mountain Colorado INSTAAR Report included at page 46 of the rezoning application, documented that two houses located downhill from the Owner's property were moved by wet snow avalanches. These two houses were depicted in a 1952 plat map. The Report referenced a 1959 wet slide avalanche, based on reports of local residents. Based on common sense that documentation justified the Town including applicants' vacant uphill property in the high hazard avalanche zone district overlay when adopted in 1979, regardless of whether the INSTAAR avalanche modeling included the Applicant's property. Applicant's suggestions that a 1959 wet slab avalanche over applicant's property did not occur, and that those two houses were not moved by an avalanche, were not persuasive to overcome the INSTAAR documentation. I would also add the Group B avalanches shown on the INSTARR report looked clearly to me as defined as Zone 1 for the lots in question. Applicant has failed to provide any written narrative explaining how the standards for rezoning approval are met, as required by LUC 1405. Applicant only cited verbatim LUC 1415 subsections C, D and E as in compliance criteria. Applicant has refused to provide supplemental information specifically requested by P&Z concerning potential avalanche deflection if the rezoning were to be approved and structures were built on the owner's property. Applicant has not submitted any depiction of the structures that could be built upon the Owners' property if rezoning were to be approved, as required by LUC section 1408.4. The Owner's consultant, Wilbur Engineering, Inc., stated at page 6 in a 2007 Avalanche Study and Avalanche Hazard Analysis for the Owner's property, that the property is entirely within a "moderate/blue" avalanche hazard classification, but applicant has declined to seek rezoning to such classification. The underlying zoning, which may be erroneous, is residential (despite open space being the only use permitted by right in an avalanche hazard zone). Ophir does not permit new residential construction in the moderate/blue zone. Accordingly, the application does not comply with LUC 1415.E. The application fails to comply with the 2021 Ophir Master Plan, Goal M, detailed objective 3, as required by LUC section 1415.D: Goal M: Prevent Damage Caused by Natural Hazards Ophir residents are susceptible to certain natural hazards given the town's location and Ophir aims to protect its residents through ongoing awareness and education. Promote land use patterns that eliminate or reduce potential development in natural hazard areas.

LAND USE CODE AMENDMENTS APPLICATION - TOWN OF OPHIR

Applicant Name: Whitaker/Cornwall Phone No. 480 639 7307
 Address: 3060 E Stella Ln, Phoenix AZ 85016 Fax No. _____
 E-Mail: joseph@josephwaller.com

Street Address and Legal Description of Subject Property:
TBD Aurum Street Lots 1-10, Block Two, Town of Ophir, Colorado

Zone District of Subject Property: Residential (R) Application Fee: \$500.00/lot, see §1404.6

Applicants should include the following:

- (1) *Narrative*
- (2) *Site Plan*
- (3) *Proof of Notification*
- (4) *Proof of Ownership by title commitment or attorney opinion*

(1) NARRATIVE: Description of the proposed amendment to the Ophir Land Use Code

(2) MAPS: Attach a map showing properties affected by the proposed zoning changes or changes to zoning, hazard or source water protection area maps which clearly demonstrate the nature of the proposed request (*Note:* Planning Commission may require more information to review the application).

(3) PROOF OF NOTIFICATION: The Applicant must provide notice in accordance with ARTICLE XIV of the Ophir Land Use Code.

I swear that the information provided in this application is true and correct and that I am the owner of the property or otherwise authorized to act on behalf of the owner of the property.

Signature: Joseph Waller Date: 6/4/2019

FOR TOWN USE ONLY:

Date Application Received: _____	Date of Hearing: _____
Application Fee Received: _____	Planning Commission Action: _____
Application Complete: _____	Approval Subject to Conditions: _____
Mailing Notice Complete: _____	Application Reviewed by: _____

Town of Ophir Official Hazard Map Amendment Request Whitaker / Cornwall Property Lots 1-10, Block Two Town Manager Review of Application June 5, 2019

1402.2 Changes to Official Mapping. - Joe Waller representing Owners of Lots 1-10, Block Two is requesting a change of the Ophir Official Hazards Map to remove these lots from High Hazard Avalanche Zone.

1403.1. Pre-Application Conference. – Mr. Waller met with Town Manger May 6, 2019.

1403.2. Submit Application. Page 1 – Mr. Waller in communication with Town Manger submitted application and support documents May 24-June-6. Town Manger requested deficiencies to be corrected by the applicants' representative prior to P&Z meeting. Representative fulfilled request June-4.

1403.3. Staff Review and Referral. Page 2 – Town Manger review of application is complete. Application has been submitted to P&Z for regular meeting June 11, 2019 7:00pm at Ophir Town Hall. Applicant has been notified of deficiencies and deficiencies have been submitted.

1404.1. Contact Information. Page 5 – Complete.

1404.2. Legal Description/Address. Page 7 – Legal description supplied by Land Title guarantee Company.

1404.3. Proof of Ownership. Page 17 – Henry E. Cornwall purchased by public sale from San Miguel County, Block Two lots:

- a) 1,2,5,6 - 8/4/42
- b) 3,4 – 3/22/46
- c) 7,8,9,10 – 4/27/42

Henry Cornwall deceased July 6,1958, heirs shares of:

- a) Wife Anna Bernice Cornwall ½
- b) Son David Thornton Cornwall ¼
- c) Daughter Joyce Ann Whitaker ¼

Wife Anna Bernice Cornwall deceased 5/25/93. Daughter Joyce Ann Whitaker appointed of the estate. 11/10/09 Joyce Anne Whitaker deeded property equally to Joyce Anne Whitaker & David Thornton Cornwall.

1404.4. Map. Page 24 – Vicinity Map verified to match Legal Description and Proof of Ownership.

1404.5. Written Description. Page 25 – The written description is a little hard to understand without being involved in the conversations and reviewing the multiple studies. Town Manager feels that it fulfills the application submittal requirements, Town Manager compiled the

information as attachments to the Application. Applicant Representative will be available for discussion.

1404.6. Fee. – Fee has not been submitted yet. The Fee is \$5,000 and withdrawal of the application prior to the Planning and Zoning Committee, the application fee may be refunded whole or in part less any administrative review costs incurred at the discretion of Town Manager. Applicant has obtained wire transfer information. (6/5)

1405. PASS-THROUGH REVIEW COST AGREEMENT. Page 26 – Pass through agreement has been submitted.

1406. CONSOLIDATION – The application includes lots 1-10, block two.

1408.1 Page 27 – Foley Survey Map

1408.2 Page 28 – Town of Ophir Official Hazard Zoning Map

1408.3 Page 25 – Same as 1404.5

1408.4 Page 29 – There is not any current intent to construct building, applicant intends to sell the properties.

1408.5 Page 29 - If the removal of lots 1-10, block two, from the high hazard designation on the Town of Ophir Hazards Map, the lots will be offered for sale allowing the construction of new single-family homes. There are no current intended buildings by the applicant.

1408.6 - There would be no adverse effect to the adjacent properties, and or to the neighborhood. Lots 1-10, block two will retain its Residential (R) zoning.

1409.1. Certification of Completeness and Compliance. – Town Manger has reviewed the application and determined the application is complete.

1409.2. Deficient Applications. – Application is complete.

1409.4. Reservation of Authority to Issue Completeness Determination. – The Town Manager reserves the right to during any subsequent review step, that the application is not complete, or does not comply with any other application requirement of this Article.

1409.5 Anticipatory Submission to Planning and Zoning Commission. – Town Manger has determined that the application is incomplete and has submitted to be included in the next P&Z scheduled meeting. Town Manager believes applicant will submit any deficiencies. Deficiencies have been completed (6/9)

1411. Provision of Public Notice. – Town manager has verified Provisions of Public Notice has been completed.

1411.7 Affidavit Page. Page 30

List of Attachments:

Request is to remove Lots 1-10, Block Two from High Hazard Avalanche Zone based on the following information.

- a) **1975 Mears Study Plate Page 31** classified the application area as below a low hazard area and in between the Badger & Spring Gulch Zones:

Group B:

These are small open-slope avalanches between Paths 5 and 6. They have small (less than 5 acres) starting zones, but steep tracks of 50 to 70 percent. They may cross the north town boundary of Ophir as either wet, dry, or powder avalanches.

- b) **1976 Natural Hazards in Mountain Colorado (INSTAAR) Page 35** This study placed the area in the application based on verbal communication with the Belisle Family due to memory and the statement of houses being moved from an avalanche. These houses were on the South Section of Lot P, located Southwest of the applicant's property. The study does represent that memory and dramatic inclination may make verbal reports inaccurate. 1904 Map of Old Ophir does not indicate there were any properties buildings located on Lot P in 1904.
- c) **2002 Mears Study prepared for Glen Pauls Page 50** This study does not include the applicant's block. The study indicates High Hazard (Red area) and Medium Hazard (Blue area). Not having a complete map of the town, I do not believe this can be utilized for a determination the applicants request. The current application supporting documents vary a little from a previous application considered for submittal in 2012. The report details specifics on how calculations are completed.
- d) **Mears Figure 3. Page 64** This is a map showing the specific property following the 2002 Mears Study.
- e) **Ophir Town Avalanche Map. Page 65** This Map is from the Mears Study for the Town of Ophir.
- f) **Ophir Avalanche Map. Page 66** This map is from the Mears Study for the Town of Ophir, Ophir Valley immediately to the East and West.
- g) **2007 Avalanche Study and Avalanche Hazard Analysis. Page 67** This study was completed specifically for the property within the application. It summarizes these previous studies and came to the conclusion that due to the 1976 Natural Hazards Study; Ophir included that applicants' property in the High Hazard zone. The study concludes:
- h) **History of Vera & Randy Belisle. Page 74** Applicant will explain relevance.
- i) **Spring Snow Slide Tiles. Page 73** Applicant will explain relevance.
- j) **1904 Map of Old Ophir. Page 78** Applicant will explain relevance.

1404.1

Property Owner Contact Information**Project Name:** Cornwall Property**Owner:** Joyce Ann Whitaker**Mailing and Physical Address:** 2186 Brittany Colony Dr. League City, TX 77573**Email:** garyandjoycewhitaker@gmail.com**Telephone:** 281 786 5502**Owner:** David Cornwall**Mailing and Physical Address:** 1050 N Portland Ave. Gilbert, AZ 85234**Email:** david.t.cornwall@gmail.com**Telephone:** 602 980 6136

Joyce Ann Whitaker

Date

Joyce Ann Whitaker6/4/2019

David Cornwall

Date

David Cornwall6/4/2019

We hereby authorize Joseph Waller to act as our agent to apply for, sign, and file the documents necessary to obtain a change to the avalanche risk designation and/or the rights to build on our Property with the following legal description: Lots 1-10, Block 2, Ophir.

Authorized Agent:

Address: 3060 E Stella Ln Phoenix AZ 85016 Phone: 480 639 7307

Signature: Joseph Waller Date: 5/21/2019
Joseph Waller

Property Owners:

Signature: Joyce Whitaker Date: 5/21/2019
Joyce Ann Whitaker

Signature: David Cornwall Date: 5/21/2019
David Cornwall



**Land Title Guarantee Company
Customer Distribution**



PREVENT FRAUD - Please remember to call a member of our closing team when initiating a wire transfer or providing wiring instructions.

Order Number: **TLR86008251-2**

Date: **05/23/2019**

Property Address: **(VACANT) AURUM STREET, OPHIR, CO 81426**

PLEASE CONTACT YOUR CLOSER OR CLOSER'S ASSISTANT FOR WIRE TRANSFER INSTRUCTIONS

For Closing Assistance

Gaylene Anderson
191 S PINE ST #1C
TELLURIDE, CO 81435
(970) 728-1023 (Work)
(970) 728-5079 (Work Fax)
ganderson@ltgc.com
Contact License: CO380183
Company License: CO44565

Closer's Assistant

Jody Metcalf
191 S PINE ST #1C
TELLURIDE, CO 81435
(970) 728-1023 (Work)
(877) 348-5414 (Work Fax)
jmetcalf@ltgc.com
Company License: CO44565

For Title Assistance

San Miguel County Title Team
191 S PINE ST #1C
TELLURIDE, CO 81435
(970) 728-8673 (Work)
(877) 261-1730 (Work Fax)
tresponse@ltgc.com

Buyer/Borrower

Seller/Owner

ALTA COMMITMENT
Old Republic National Title Insurance Company
Schedule A

Order Number: TLR86008251-2**Property Address:**(VACANT) AURUM STREET, OPHIR, CO 81426**1. Effective Date:**

07/12/2018 at 5:00 P.M.

2. Policy to be Issued and Proposed Insured:

"ALTA" Owner's Policy 06-17-06

\$0.00

Proposed Insured:

3. The estate or interest in the land described or referred to in this Commitment and covered herein is:

A FEE SIMPLE

4. Title to the estate or interest covered herein is at the effective date hereof vested in:

JOYCE ANN WHITAKER AND DAVID T. CORNWALL, ALSO KNOWN AS DAVID THORNTON CORNWALL

5. The Land referred to in this Commitment is described as follows:LOTS 1, 2, 3, 4, 5, 6, 7, 8, 9 AND 10, BLOCK 2, OPHIR TOWNSITE, ACCORDING TO THE PLAT RECORDED
JUNE 16, 1898 IN PLAT BOOK 28 AT PAGE 12, COUNTY OF SAN MIGUEL, STATE OF COLORADO.

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AMERICAN
LAND TITLE
ASSOCIATION



ALTA COMMITMENT
Old Republic National Title Insurance Company
Schedule B, Part I
(Requirements)

Order Number: TLR86008251-2

All of the following Requirements must be met:

This proposed Insured must notify the Company in writing of the name of any party not referred to in this Commitment who will obtain an interest in the Land or who will make a loan on the Land. The Company may then make additional Requirements or Exceptions.

Pay the agreed amount for the estate or interest to be insured.

Pay the premiums, fees, and charges for the Policy to the Company.

Documents satisfactory to the Company that convey the Title or create the Mortgage to be insured, or both, must be properly authorized, executed, delivered, and recorded in the Public Records.

1. PROVIDE LAND TITLE GUARANTEE COMPANY WITH A CURRENT IMPROVEMENT LOCATION CERTIFICATE OF SUBJECT PROPERTY. THIS REQUIREMENT IS NECESSARY TO DELETE STANDARD EXCEPTIONS 1 THROUGH 3. UPON REVIEW, ADDITIONAL REQUIREMENTS AND/OR EXCEPTIONS MAY BE NECESSARY.

NOTE: ANY MATTERS DISCLOSED BY SAID IMPROVEMENT LOCATION CERTIFICATE WILL BE REFLECTED ON SAID POLICY(S) TO BE ISSUED HEREUNDER.

NOTE: LAND TITLE IS NOT RESPONSIBLE FOR ORDERING SAID IMPROVEMENT LOCATION CERTIFICATE.

2. EVIDENCE SATISFACTORY TO THE COMPANY THAT THE TERMS, CONDITIONS AND PROVISIONS OF THE TOWN OF OPHIR TRANSFER TAX HAVE BEEN SATISFIED FOR PERSONAL REPRESENTATIVE'S DEED RECORDED NOVEMBER 18, 2009 UNDER RECEPTION NO. 409885.
3. WARRANTY DEED FROM JOYCE ANN WHITAKER AND DAVID T. CORNWALL, ALSO KNOWN AS DAVID THORNTON CORNWALL TO
4. EVIDENCE SATISFACTORY TO THE COMPANY THAT THE TERMS, CONDITIONS AND PROVISIONS OF THE TOWN OF OPHIR TRANSFER TAX HAVE BEEN SATISFIED.

REQUIREMENTS TO DELETE THE PRE-PRINTED EXCEPTIONS IN THE OWNER'S POLICY TO BE ISSUED

A. UPON RECEIPT BY THE COMPANY OF A SATISFACTORY FINAL AFFIDAVIT AND AGREEMENT FROM THE SELLER AND PROPOSED INSURED, AND A SURVEY OF THE LAND, EXCEPTIONS 1 THROUGH 4 OF THE STANDARD EXCEPTIONS WILL BE DELETED. ANY ADVERSE MATTERS DISCLOSED BY THE FINAL AFFIDAVIT AND AGREEMENT AND SURVEY WILL BE ADDED AS EXCEPTIONS.

B. IF LAND TITLE GUARANTEE COMPANY CONDUCTS THE CLOSING OF THE CONTEMPLATED TRANSACTIONS AND RECORDS THE DOCUMENTS IN CONNECTION THEREWITH, EXCEPTION NO. 5 OF THE STANDARD EXCEPTIONS WILL BE DELETED.

C. UPON RECEIPT OF PROOF OF PAYMENT OF ALL PRIOR YEARS' TAXES AND ASSESSMENTS, EXCEPTION NO. 6 OF THE STANDARD EXCEPTIONS WILL BE AMENDED TO READ:

TAXES AND ASSESSMENTS FOR THE YEAR 2018 AND SUBSEQUENT YEARS.

ALTA COMMITMENT
Old Republic National Title Insurance Company
Schedule B, Part II
(Exceptions)

Order Number: TLR86008251-2

This commitment does not republish any covenants, condition, restriction, or limitation contained in any document referred to in this commitment to the extent that the specific covenant, conditions, restriction, or limitation violates state or federal law based on race, color, religion, sex, sexual orientation, gender identity, handicap, familial status, or national origin.

1. Any facts, rights, interests, or claims thereof, not shown by the Public Records but that could be ascertained by an inspection of the Land or that may be asserted by persons in possession of the Land.
2. Easements, liens or encumbrances, or claims thereof, not shown by the Public Records.
3. Any encroachment, encumbrance, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land and not shown by the Public Records.
4. Any lien, or right to a lien, for services, labor or material heretofore or hereafter furnished, imposed by law and not shown by the Public Records.
5. Defects, liens, encumbrances, adverse claims or other matters, if any, created, first appearing in the public records or attaching subsequent to the effective date hereof but prior to the date of the proposed insured acquires of record for value the estate or interest or mortgage thereon covered by this Commitment.
6. (a) Taxes or assessments that are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the Public Records; (b) proceedings by a public agency that may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the Public Records.
7. (a) Unpatented mining claims; (b) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (c) water rights, claims or title to water.
8. RESERVATION OF ANY MINE OF GOLD, SILVER, CINNABAR OR COPPER, OR TO ANY VALID MINING CLAIM OR POSSESSION HELD UNDER EXISTING LAWS, AND SUBJECT TO ALL CONDITIONS, LIMITATIONS AND RESTRICTIONS CONTAINED IN SECTION 2386 OF THE REVISED STATUTES OF THE UNITED STATES AS CONTAINED IN UNITED STATES PATENT RECORDED JULY 20, 1887 IN BOOK 50 AT PAGE 6.
9. EASEMENTS, CONDITIONS, COVENANTS, RESTRICTIONS, RESERVATIONS AND NOTES ON THE PLAT OF OPHIR TOWNSITE RECORDED JANUARY 13, 1896 IN PLAT BOOK 28 AT PAGE 9 AND THE REVISED PLAT OF OPHIR TOWNSITE RECORDED JUNE 16, 1898 IN PLAT BOOK 28 AT PAGE 12.
10. TERMS, CONDITIONS, PROVISIONS, BURDENS AND OBLIGATIONS AS SET FORTH IN TOWN ZONING ORDINANCE RECORDED JUNE 28, 1977 IN BOOK 365 AT PAGE 975 AND AS AMENDED IN INSTRUMENT RECORDED OCTOBER 7, 1992 IN BOOK 499 AT PAGE 408.
11. EASEMENT GRANTED TO MOUNTAIN STATES TELEPHONE AND TELEGRAPH COMPANY, FOR COMMUNICATION AND OTHER FACILITIES, AND INCIDENTAL PURPOSES, BY INSTRUMENT RECORDED AUGUST 24, 1982, IN BOOK 400 AT PAGE 651.
12. TERMS, CONDITIONS, PROVISIONS, BURDENS AND OBLIGATIONS AS SET FORTH IN DOG CONTROL & LICENSING ORDINANCE RECORDED NOVEMBER 22, 1991 IN BOOK 485 AT PAGE 54.

ALTA COMMITMENT
Old Republic National Title Insurance Company
Schedule B, Part II
(Exceptions)

Order Number: TLR86008251-2

13. TERMS, CONDITIONS AND PROVISIONS OF INTERGOVERNMENTAL AGREEMENT RECORDED APRIL 21, 1993 IN BOOK 509 AT PAGE 884 AND RE-RECORDED APRIL 23, 1993 IN BOOK 509 AT PAGE 1005.
14. TERMS, CONDITIONS, PROVISIONS, BURDENS AND OBLIGATIONS AS SET FORTH IN SERVICE PLAN FOR THE OPHIR VALLEY WILDLIFE AND CONSERVATION DISTRICT RECORDED MAY 29, 1996 IN BOOK 562 AT PAGE 442.
15. TERMS, CONDITIONS, PROVISIONS, BURDENS AND OBLIGATIONS AS SET FORTH IN RESOLUTION #1996-5 AMENDING THE SAN MIGUEL COUNTY LAND USE CODE RECORDED JUNE 19, 1996 IN BOOK 563 AT PAGE 562.
16. TERMS, CONDITIONS, PROVISIONS, BURDENS AND OBLIGATIONS AS SET FORTH IN ORDINANCE #2010-7 RECORDED DECEMBER 23, 2010 UNDER RECEPTION NO. 415529.
17. MATTERS DISCLOSED ON LAND SURVEY PLAT ISSUED BY FOLEY ASSOCIATES, INC., JOB NO. 10014, RECORDED JUNE 21, 2011 IN SURVEYORS PLAT BOOK S1 AT PAGE 730.



LAND TITLE GUARANTEE COMPANY DISCLOSURE STATEMENTS

Note: Pursuant to CRS 10-11-122, notice is hereby given that:

- (A) The Subject real property may be located in a special taxing district.
- (B) A certificate of taxes due listing each taxing jurisdiction will be obtained from the county treasurer of the county in which the real property is located or that county treasurer's authorized agent unless the proposed insured provides written instructions to the contrary. (for an Owner's Policy of Title Insurance pertaining to a sale of residential real property).
- (C) The information regarding special districts and the boundaries of such districts may be obtained from the Board of County Commissioners, the County Clerk and Recorder, or the County Assessor.

Note: Effective September 1, 1997, CRS 30-10-406 requires that all documents received for recording or filing in the clerk and recorder's office shall contain a top margin of at least one inch and a left, right and bottom margin of at least one half of an inch. The clerk and recorder may refuse to record or file any document that does not conform, except that, the requirement for the top margin shall not apply to documents using forms on which space is provided for recording or filing information at the top margin of the document.

Note: Colorado Division of Insurance Regulations 8-1-2 requires that "Every title entity shall be responsible for all matters which appear of record prior to the time of recording whenever the title entity conducts the closing and is responsible for recording or filing of legal documents resulting from the transaction which was closed". Provided that Land Title Guarantee Company conducts the closing of the insured transaction and is responsible for recording the legal documents from the transaction, exception number 5 will not appear on the Owner's Title Policy and the Lenders Policy when issued.

Note: Affirmative mechanic's lien protection for the Owner may be available (typically by deletion of Exception no. 4 of Schedule B, Section 2 of the Commitment from the Owner's Policy to be issued) upon compliance with the following conditions:

- (A) The land described in Schedule A of this commitment must be a single family residence which includes a condominium or townhouse unit.
- (B) No labor or materials have been furnished by mechanics or material-men for purposes of construction on the land described in Schedule A of this Commitment within the past 6 months.
- (C) The Company must receive an appropriate affidavit indemnifying the Company against un-filed mechanic's and material-men's liens.
- (D) The Company must receive payment of the appropriate premium.
- (E) If there has been construction, improvements or major repairs undertaken on the property to be purchased within six months prior to the Date of Commitment, the requirements to obtain coverage for unrecorded liens will include: disclosure of certain construction information; financial information as to the seller, the builder and or the contractor; payment of the appropriate premium fully executed Indemnity Agreements satisfactory to the company, and, any additional requirements as may be necessary after an examination of the aforesaid information by the Company.

No coverage will be given under any circumstances for labor or material for which the insured has contracted for or agreed to pay.

Note: Pursuant to CRS 10-11-123, notice is hereby given:

This notice applies to owner's policy commitments disclosing that a mineral estate has been severed from the surface estate, in Schedule B-2.

- (A) That there is recorded evidence that a mineral estate has been severed, leased, or otherwise conveyed from the surface estate and that there is substantial likelihood that a third party holds some or all interest in oil, gas, other minerals, or geothermal energy in the property; and
- (B) That such mineral estate may include the right to enter and use the property without the surface owner's permission.

Note: Pursuant to CRS 10-1-128(6)(a), It is unlawful to knowingly provide false, incomplete, or misleading facts or information to an insurance company for the purpose of defrauding or attempting to defraud the company. Penalties may include imprisonment, fines, denial of insurance, and civil damages. Any insurance company or agent of an insurance company who knowingly provides false, incomplete, or misleading facts or information to a policyholder or claimant for the purpose of defrauding or attempting to defraud the policyholder or claimant with regard to a settlement or award payable from insurance proceeds shall be reported to the Colorado Division of Insurance within the Department of Regulatory Agencies.

Note: Pursuant to Colorado Division of Insurance Regulations 8-1-3, notice is hereby given of the availability of a closing protection letter for the lender, purchaser, lessee or seller in connection with this transaction.



**JOINT NOTICE OF PRIVACY POLICY OF
LAND TITLE GUARANTEE COMPANY,
LAND TITLE GUARANTEE COMPANY OF SUMMIT COUNTY
LAND TITLE INSURANCE CORPORATION AND
OLD REPUBLIC NATIONAL TITLE INSURANCE COMPANY**

This Statement is provided to you as a customer of Land Title Guarantee Company as agent for Land Title Insurance Corporation and Old Republic National Title Insurance Company.

We want you to know that we recognize and respect your privacy expectations and the requirements of federal and state privacy laws. Information security is one of our highest priorities. We recognize that maintaining your trust and confidence is the bedrock of our business. We maintain and regularly review internal and external safeguards against unauthorized access to non-public personal information ("Personal Information").

In the course of our business, we may collect Personal Information about you from:

- applications or other forms we receive from you, including communications sent through TMX, our web-based transaction management system;
 - your transactions with, or from the services being performed by us, our affiliates, or others;
 - a consumer reporting agency, if such information is provided to us in connection with your transaction;
- and
- The public records maintained by governmental entities that we either obtain directly from those entities, or from our affiliates and non-affiliates.

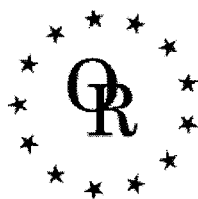
Our policies regarding the protection of the confidentiality and security of your Personal Information are as follows:

- We restrict access to all Personal Information about you to those employees who need to know that information in order to provide products and services to you.
- We maintain physical, electronic and procedural safeguards that comply with federal standards to protect your Personal Information from unauthorized access or intrusion.
- Employees who violate our strict policies and procedures regarding privacy are subject to disciplinary action.
- We regularly assess security standards and procedures to protect against unauthorized access to Personal Information.

WE DO NOT DISCLOSE ANY PERSONAL INFORMATION ABOUT YOU WITH ANYONE FOR ANY PURPOSE THAT IS NOT PERMITTED BY LAW.

Consistent with applicable privacy laws, there are some situations in which Personal Information may be disclosed. We may disclose your Personal Information when you direct or give us permission; when we are required by law to do so, for example, if we are served a subpoena; or when we suspect fraudulent or criminal activities. We also may disclose your Personal Information when otherwise permitted by applicable privacy laws such as, for example, when disclosure is needed to enforce our rights arising out of any agreement, transaction or relationship with you.

Our policy regarding dispute resolution is as follows: Any controversy or claim arising out of or relating to our privacy policy, or the breach thereof, shall be settled by arbitration in accordance with the rules of the American Arbitration Association, and judgment upon the award rendered by the arbitrator(s) may be entered in any court having jurisdiction thereof.



Commitment For Title Insurance

Issued by Old Republic National Title Insurance Corporation

NOTICE

IMPORTANT—READ CAREFULLY: THIS COMMITMENT IS AN OFFER TO ISSUE ONE OR MORE TITLE INSURANCE POLICIES. ALL CLAIMS OR REMEDIES SOUGHT AGAINST THE COMPANY INVOLVING THE CONTENT OF THIS COMMITMENT OR THE POLICY MUST BE BASED SOLELY IN CONTRACT.

THIS COMMITMENT IS NOT AN ABSTRACT OF TITLE, REPORT OF THE CONDITION OF TITLE, LEGAL OPINION, OPINION OF TITLE, OR OTHER REPRESENTATION OF THE STATUS OF TITLE. THE PROCEDURES USED BY THE COMPANY TO DETERMINE INSURABILITY OF THE TITLE, INCLUDING ANY SEARCH AND EXAMINATION, ARE PROPRIETARY TO THE COMPANY, WERE PERFORMED SOLELY FOR THE BENEFIT OF THE COMPANY, AND CREATE NO EXTRACONTRACTUAL LIABILITY TO ANY PERSON, INCLUDING A PROPOSED INSURED.

THE COMPANY'S OBLIGATION UNDER THIS COMMITMENT IS TO ISSUE A POLICY TO A PROPOSED INSURED IDENTIFIED IN SCHEDULE A IN ACCORDANCE WITH THE TERMS AND PROVISIONS OF THIS COMMITMENT. THE COMPANY HAS NO LIABILITY OR OBLIGATION INVOLVING THE CONTENT OF THIS COMMITMENT TO ANY OTHER PERSON.

COMMITMENT TO ISSUE POLICY

Subject to the Notice; Schedule B, Part I—Requirements; Schedule B, Part II—Exceptions; and the Commitment Conditions, Old Republic National Title Insurance Company, a Minnesota corporation (the "Company"), commits to issue the Policy according to the terms and provisions of this Commitment. This Commitment is effective as of the Commitment Date shown in Schedule A for each Policy described in Schedule A, only when the Company has entered in Schedule A both the specified dollar amount as the Proposed Policy Amount and the name of the Proposed Insured. If all of the Schedule B, Part I—Requirements have not been met within 6 months after the Commitment Date, this Commitment terminates and the Company's liability and obligation end.

COMMITMENT CONDITIONS

1. DEFINITIONS

- (a) "Knowledge" or "Known": Actual or imputed knowledge, but not constructive notice imparted by the Public Records.
- (b) "Land": The land described in Schedule A and affixed improvements that by law constitute real property. The term "Land" does not include any property beyond the lines of the area described in Schedule A, nor any right, title, interest, estate, or easement in abutting streets, roads, avenues, alleys, lanes, ways, or waterways, but this does not modify or limit the extent that a right of access to and from the Land is to be insured by the Policy.
- (c) "Mortgage": A mortgage, deed of trust, or other security instrument, including one evidenced by electronic means authorized by law.
- (d) "Policy": Each contract of title insurance, in a form adopted by the American Land Title Association, issued or to be issued by the Company pursuant to this Commitment.
- (e) "Proposed Insured": Each person identified in Schedule A as the Proposed Insured of each Policy to be issued pursuant to this Commitment.
- (f) "Proposed Policy Amount": Each dollar amount specified in Schedule A as the Proposed Policy Amount of each Policy to be issued pursuant to this Commitment.
- (g) "Public Records": Records established under state statutes at the Commitment Date for the purpose of imparting constructive notice of matters relating to real property to purchasers for value and without Knowledge.
- (h) "Title": The estate or interest described in Schedule A.

2. If all of the Schedule B, Part I—Requirements have not been met within the time period specified in the Commitment to Issue Policy, Commitment terminates and the Company's liability and obligation end.

3. The Company's liability and obligation is limited by and this Commitment is not valid without:

- (a) the Notice;
- (b) the Commitment to Issue Policy;
- (c) the Commitment Conditions;
- (d) Schedule A;
- (e) Schedule B, Part I—Requirements; and
- (f) Schedule B, Part II—Exceptions; and
- (g) a counter-signature by the Company or its issuing agent that may be in electronic form.

4. COMPANY'S RIGHT TO AMEND

The Company may amend this Commitment at any time. If the Company amends this Commitment to add a defect, lien, encumbrance, adverse claim, or other matter recorded in the Public Records prior to the Commitment Date, any liability of the Company is limited by Commitment Condition 5. The Company shall not be liable for any other amendment to this Commitment.

5. LIMITATIONS OF LIABILITY

- (a) The Company's liability under Commitment Condition 4 is limited to the Proposed Insured's actual expense incurred in the interval between the Company's delivery to the Proposed Insured of the Commitment and the delivery of the amended Commitment, resulting from the Proposed Insured's good faith reliance to:
 - i. comply with the Schedule B, Part I—Requirements;
 - ii. eliminate, with the Company's written consent, any Schedule B, Part II—Exceptions; or
 - iii. acquire the Title or create the Mortgage covered by this Commitment.
- (b) The Company shall not be liable under Commitment Condition 5(a) if the Proposed Insured requested the amendment or had Knowledge of the matter and did not notify the Company about it in writing.
- (c) The Company will only have liability under Commitment Condition 4 if the Proposed Insured would not have incurred the expense had the Commitment included the added matter when the Commitment was first delivered to the Proposed Insured.
- (d) The Company's liability shall not exceed the lesser of the Proposed Insured's actual expense incurred in good faith and described in Commitment Conditions 5(a)(i) through 5(a)(iii) or the Proposed Policy Amount.

- (e) The Company shall not be liable for the content of the Transaction Identification Data, if any.
- (f) In no event shall the Company be obligated to issue the Policy referred to in this Commitment unless all of the Schedule B, Part I—Requirements have been met to the satisfaction of the Company.
- (g) In any event, the Company's liability is limited by the terms and provisions of the Policy.

6. LIABILITY OF THE COMPANY MUST BE BASED ON THIS COMMITMENT

- (a) Only a Proposed Insured identified in Schedule A, and no other person, may make a claim under this Commitment.
- (b) Any claim must be based in contract and must be restricted solely to the terms and provisions of this Commitment.
- (c) Until the Policy is issued, this Commitment, as last revised, is the exclusive and entire agreement between the parties with respect to the subject matter of this Commitment and supersedes all prior commitment negotiations, representations, and proposals of any kind, whether written or oral, express or implied, relating to the subject matter of this Commitment.
- (d) The deletion or modification of any Schedule B, Part II—Exception does not constitute an agreement or obligation to provide coverage beyond the terms and provisions of this Commitment or the Policy.
- (e) Any amendment or endorsement to this Commitment must be in writing and authenticated by a person authorized by the Company.
- (f) When the Policy is issued, all liability and obligation under this Commitment will end and the Company's only liability will be under the Policy.

7. IF THIS COMMITMENT HAS BEEN ISSUED BY AN ISSUING AGENT

The issuing agent is the Company's agent only for the limited purpose of issuing title insurance commitments and policies. The issuing agent is not the Company's agent for the purpose of providing closing or settlement services.

8. PRO-FORMA POLICY

The Company may provide, at the request of a Proposed Insured, a pro-forma policy illustrating the coverage that the Company may provide. A pro-forma policy neither reflects the status of Title at the time that the pro-forma policy is delivered to a Proposed Insured, nor is it a commitment to insure.

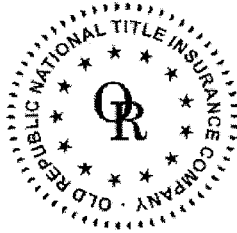
9. ARBITRATION

The Policy contains an arbitration clause. All arbitrable matters when the Proposed Policy Amount is \$2,000,000 or less shall be arbitrated at the option of either the Company or the Proposed Insured as the exclusive remedy of the parties. A Proposed Insured may review a copy of the arbitration rules at <http://www.alta.org/arbitration>.


IN WITNESS WHEREOF, Land Title Insurance Corporation has caused its corporate name and seal to be affixed by its duly authorized officers on the date shown in Schedule A to be valid when countersigned by a validating officer or other authorized signatory.

Issued by:
Land Title Guarantee
Company
3033 East First Avenue Suite
600
Denver, Colorado 80206
303-321-1880


President



Old Republic National Title Insurance Company, a Stock
Company
400 Second Avenue South
Minneapolis, Minnesota 55401
(612)371-1111



Mark Bilbrey, President



Rande Yeager, Secretary

This page is only a part of a 2016 ALTA® Commitment for Title Insurance issued by Land Title Insurance Corporation. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I—Requirements; and Schedule B, Part II—Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

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No. 5084-P—Revised 1941

DEED FROM COUNTY—Out West Printing and Stationery Co., Colorado Springs, Colo. G5990

Know all Men by these Presents, That Whereas, a Treasurer's Deed dated the 22nd day of June, 1942, conveying the hereinafter described real estate, was delivered to the County of San Miguel, State of Colorado, and said Treasurer's Deed was duly recorded in Book 209 at Page 34 of the records of the County Clerk and Recorder of the County of San Miguel, State of Colorado;

And Whereas, Henry E. Cornwall made written application for the sale of the hereinafter described property and deposited with the County Commissioners the cost of advertising;

And Whereas the County Commissioners of the County of San Miguel did cause notice of sale at public sale of such real estate to be advertised and posted in the manner and for the time required by law and did offer such real estate for sale at public sale on the 4th day of August, 1942, at the time and place as stated in said notice;

And Whereas, Henry E. Cornwall of the County of San Miguel, State of Colorado, bid for said property the sum of Twenty DOLLARS and No CENTS which bid being the highest and best bid for cash and being more than the appraisal value made by the County Assessor of said property for this year, was accepted by the Board of County Commissioners of the said County of San Miguel;

And Whereas, the said Henry E. Cornwall has paid the sum of Twenty DOLLARS and No CENTS in full payment of said bid for said property;

Now Therefore, the County of San Miguel by and through the Board of County Commissioners of said county, for and in consideration of the sum of Twenty DOLLARS and No CENTS paid as aforesaid, and by virtue of the statutes in such case made and provided by these presents does grant, bargain and sell the following described real estate, to-wit:

Lots One (1), Two (2), Five (5) and Six (6), Block Two (2), Town of Ophir, Colorado,

situate, lying and being in the County of San Miguel, State of Colorado, unto the said Henry E. Cornwall his heirs and assigns, without any covenants of warranty whatsoever and subject to all the rights of redemption by minors, insane persons or idiots as provided by law and the lien of any special assessments against said real estate or the conveyance thereof by the county.

In Witness Whereof, I, Donald A. O'Rourke, County Treasurer of said County of San Miguel, State of Colorado, on behalf of said County and by virtue of the direction contained in the order made by said Board of County Commissioners on the 5th day of November, 1951, have hereunto set my hand and affixed the seal of said County this 9th day of November, 1951, for the uses and purposes therein set forth.
(Seal of the County Treasurer)
(San Miguel County, Colorado)

Donald A. O'Rourke
County Treasurer of the County of San Miguel, Colo.

STATE OF COLORADO, }
County of San Miguel, } ss. The foregoing instrument was acknowledged before me this 9th day of November, 1951, by Henry E. Cornwall, as County Treasurer of the County of San Miguel in the State of Colorado.

My commission expires
Witness my hand and official seal this day of , A. D. 19 .

Filed for record the 9th day of November, A. D. 1951, at 11:05 o'clock A.M.

No. 101411

Sally A. Clark RECORDER.
By Jennie Roush DEPUTY.

STATE OF COLORADO, COUNTY OF SAN MIGUEL, ss. I hereby certify that before me Jennie Roush Deputy County Clerk and Recorder in and for said County, personally appeared the above named Donald A. O'Rourke, Treasurer of said County, personally known to me to be the Treasurer of said County at the date of this execution of the above conveyance, and to be the identical person whose name is affixed to the foregoing deed, and who executed the above conveyance as Treasurer of the said County, and who acknowledged the execution of the same to be his voluntary act and deed as Treasurer of said County, for the purposes therein expressed. Given under my hand and official seal, this 9th day of November, A. D. 1951.
Jennie Roush, Deputy County Clerk and Recorder (Seal of County Clerk)

Book 210
page 77

same to be his voluntary act and deed as Treasurer of said County, for the purposes therein expressed

No. 6084-P—Revised 1941

DEED FROM COUNTY—Out West Printing and Stationery Co., Colorado Springs, Colo. C9990

Know all Men by these Presents, That Whereas, a Treasurer's Deed dated the 15th day of February, 1946, conveying the hereinafter described real estate, was delivered to the County of San Miguel, State of Colorado, and said Treasurer's Deed was duly recorded in Book 209 at Page 290 of the records of the County Clerk and Recorder of the County of San Miguel, State of Colorado;

And Whereas, Henry E. Cornwall made written application for the sale of the hereinafter described property and deposited with the County Commissioners the cost of advertising;

And Whereas the County Commissioners of the County of San Miguel did cause notice of sale at public sale of such real estate to be advertised and posted in the manner and for the time required by law and did offer such real estate for sale at public sale on the 22nd day of March, 1946, at the time and place as stated in said notice;

And Whereas, Henry E. Cornwall of the County of San Miguel, State of Colorado, bid for said property the sum of Ten DOLLARS and No CENTS which bid being the highest and best bid for cash and being more than the appraisal value made by the County Assessor of said property for this year, was accepted by the Board of County Commissioners of the said County of San Miguel;

And Whereas, the said Henry E. Cornwall has paid the sum of Ten DOLLARS and No CENTS full payment of said bid for said property;

Now Therefore, the County of San Miguel by and through the Board of County Commissioners of said county, for and in consideration of the sum of Ten DOLLARS and No CENTS paid as aforesaid, and by virtue of the statutes in such case made and provided by these presents does grant, bargain and sell the following described real estate, to-wit:

Lots Three (3) and Four (4), Block Two (2), Town of Ophir, Colorado

do hereby certify that before me Jennie Roush, Deputy County Clerk and Recorder in and for said County, personally appeared the above named Donald A. O'Rourke, and to be the identical person whose name is affixed to the foregoing deed, and who executed the above conveyance as Treasurer of the said County of San Miguel, State of Colorado, on this 9th day of November, A. D. 1951.

[County Seal]

In Witness Whereof, I, Donald A. O'Rourke, County Treasurer of said County of San Miguel, State of Colorado, on behalf of said County and by virtue of the direction contained in the order made by said Board of County Commissioners on the 5th day of November, 1951, have hereunto set my hand and affixed the seal of said County this 9th day of November, 1951 for the uses and purposes therein set forth.

(Seal of the County Treasurer)
(San Miguel County, Colorado)

Donald A. O'Rourke
County Treasurer of the County of San Miguel, Colo.

STATE OF COLORADO,
County of San Miguel, ss.

The foregoing instrument was acknowledged before me this _____ day of _____, 19____, by _____

as County Treasurer of the County of San Miguel in the State of Colorado.

My commission expires _____

Witness my hand and official seal this _____ day of _____, A. D. 19____

Filed for record the 9th day of November, A. D. 1951, at 11:10 o'clock A. M.

Sally A. Clark RECORDER.

By Jennie Roush DEPUTY.

No. 101412

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page 78

409885

Page 1 of 2

SAN MIGUEL COUNTY, CO

PEGGY MERLIN CLERK-RECORDER

11-18-2009 10:31 AM Recording Fee \$21.00

State Documentary Fee

Date NOV. 18, 2009

\$EXEMPT JF

ck _____ M., _____ Recorder.

PERSONAL REPRESENTATIVE'S DEED

THIS DEED is made this 18th day of November, 2009, between JOYCE ANN WHITAKER as Personal Representative of The Estate of Anna Bernice Cornwall, GRANTOR, and JOYCE ANN WHITAKER, whose address is 2186 Brittany Colony Drive, League City, Texas 77573, and DAVID T. CORNWALL, whose address is 1050 Portland Avenue, Gilbert, Arizona 85234, GRANTEES as tenants in common.

WHEREAS the above named decedent died on May 25, 1993; and

WHEREAS, GRANTOR was duly appointed Personal Representative of said Estate by the District Court in and for the County of San Miguel, State of Colorado, Case No. 2009PR9, on May 22, 2009, and is now qualified and acting in said capacity.

NOW THEREFORE, pursuant to the powers conferred upon GRANTOR by the Colorado Probate Code, GRANTOR for and in consideration of Ten Dollars (\$10.00) and other good and valuable consideration, the receipt and sufficiency of which is acknowledged, has granted, bargained, sold and conveyed and by these presents does grant, bargain, sell and convey to GRANTEES as tenants in common, the following real property:

Lots One (1), Two (2), Three (3), Four (4), Five (5), Six (6), Seven (7), Eight (8), Nine (9) and Ten (10), Block 2, Town of Ophir, Colorado.

County of San Miguel, State of Colorado.

To have and to hold the property, together with all and singular the rights, members and appurtenances thereof, to the same belong in or in any way appertaining, to the only proper use and benefit of GRANTEES to same extent and manner as was held by the deceased.

In witness of the above, GRANTOR has signed, sealed and delivered this Deed on the date written above.



JOYCE ANN WHITAKER as Personal Representative of The Estate of ANNA BERNICE CORNWALL, deceased.

Notary on next page.

STATE OF Texas }
COUNTY OF Gulveston } ss.

The foregoing instrument was acknowledged before me this 10 day of November, 2009, by Joyce Ann Whitaker as Personal Representative of The Estate of Anna Bernice Cornwall, deceased.

Witness my hand and official seal.
My commission expires: May 26, 2013



[Signature]
Notary Public

Gay Capps-Recorder
by *Kathleen J. [Signature]* DeputyDISTRICT COURT
STATE OF COLORADO
County of San Miguel

Probate No. 81724

DECREE OF HEIRSHIP - SPECIAL PROCEEDING

In the matter of the Estate of Henry Edward Cornwall,
Deceased

Based upon the petition of the petitioners which has been filed in this action the court finds and decrees as follows:

1. That Henry Edward Cornwall died on July 6, 1958.
2. That at the time of his death Henry Edward Cornwall was a resident of Fabens, Texas.
3. That the names, addresses and relationship of all interested persons are as follows:

Anna Bernice Cornwall	wife
P.O. Box 568	
Fabens, Texas 79838	
David Thornton Cornwall	son
2632 N. 65th Avenue	
Phoenix, Arizona 85035	
Joyce Ann Whitaker	daughter
6202 Hampton	
Amarillo, Texas 79109	
4. That no proceedings have been filed for probate of the decedent's estate in any other state or jurisdiction.
5. That Henry Edward Cornwall died without a will.

NOW THEREFORE, it is DECREED that the following persons are the heirs of Henry Edward Cornwall and that they shall receive the corresponding share of the estate:

Heir	Share of Estate
Anna Bernice Cornwall	One-half (1/2) of the estate
David Thornton Cornwall	One-fourth (1/4) of the estate
Joyce Ann Whitaker	One-fourth (1/4) of the estate

Dated:

10/26/81

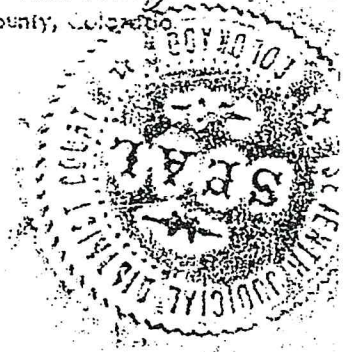
Jerry D. Lincoln
Judge Jerry Lincoln

CERTIFICATE

The document to which this certificate is attached is a full, true and correct copy of the original of record in my office.

Given under my hand and seal of office this 28th day of December, 1981.

Linda C. Bryant
Clerk of the Court
of San Miguel County, Colorado



TOWN OF OPHIR LAND USE CODE



The applicant is requesting that lots 1-10 block two be removed from the High Avalanche designation on the Town of Ophir Hazards Map.

The property, lots 1-10 block two, has been in the Cornwall family since 1942 when Henry Cornwall, the book keeper for the Silver Bell Mine, purchased it from the County of San Miguel *(1404.2). The Property was at the time, and continues to be zoned as Residential (R) *(1404.4).

In 1976 the Institute of Arctic and Alpine Research, was seeking to develop methodologies, including a combination of remote sensing techniques and interdisciplinary field studies, to assist governmental agencies at the township level, and to alleviate land management in natural hazard areas; including avalanche, landslide, mudflow, rockfall, and mountain flood *(INSTAAR). As a part of this project, INSTAAR published a case study for the town of Ophir based on the Ophir Area Plate 9 open-file report provided by Art Mears to the State of Colorado in 1975 *(Special Publication Plate 9). The Mears open-file report includes 15 hazard mapping area's initially done on 1:24,000-scale (forty foot intervals) U.S. Geological Survey topographic maps. The Plate 9 avalanche hazard zone map is defined by High Hazard Zone I, Moderate Hazard Zone II, Zone Boundary, and Small Avalanches. Small Avalanche areas are designated as Groups A, B, C, and D reflecting Small Avalanche Path's that are not to be included in either high or moderate hazard zones. INSTAAR addresses Group A, B, C and D as minor paths indicated by arrows Fig. 2.

The adopted Town of Ophir Hazards Map applies the High Hazard designation to lots 1-10, block two, yet, on the INSTAAR map produced for the Town, the Property lies outside of the INSTAAR Zone 1. On the INSTAAR map, the Property corresponds with Group B, and or minor paths according the the INSTAAR report Fig.2. *(2002 Mears Report), *(2007 Wilbur Report).

Additionally, INSTAAR Fig 10., references "Houses moved by wet snow avalanches" and identified those as 1 and 2 on the map, yet no such homes exist on the Map of Old Ophir *(Map of Old Ophir). The Telluride Historical Museum database has information and photos relating to a "Spring Snow Slide at Old Ophir May 13 1918". The information and photos supplied reference two structures, however analysis of the supplied photos show that the area in question is by the Telephone Office (J) located on Granite Ave and Second St. *(Spring Snow Slide May 13 1918).

It appears that the inclusion of Lots 1-10, Block 2 in the High Avalanche Hazard zone may have been based on an incorrect interpretation of the INSTAAR report information. The applicant requests that the map be amended to reflect the removal of the Property from the High Avalanche Hazard Zone.

1405

Pass-Through Review Cost Agreement

Project Name: Cornwall Property

Project Summary: The evaluation of avalanche hazard and mapping within lots 1-10, block two, Article 804 overlay adjustment, Appendix C Town of Ophir Hazards Map.

Legal Description: Lots 1-10, Block Two, Town of Ophir, Colorado

Address: NA

Owner: Joyce Whitaker, David Cornwall

Applicant: Joseph Waller

Joseph Waller, the applicant, agrees to pay all of The Town of Ophir's application review fees, regardless of whether the application is approved, denied, approved with conditions, suspended, withdrawn, or dismissed. Joseph Waller shall be responsible for all costs borne by the Town of Ophir to review, analyze, comment upon and process the application.

Joseph Waller

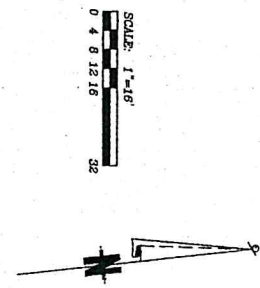
Date

Joseph Waller

5/30/2019

1408.1

LAND SURVEY PLAT OF LOTS 1-10, BLOCK 2, TOWN OF OPHIR
LOCATED WITHIN SECTION 35, T.42N., R.9W., N.M.P.M.



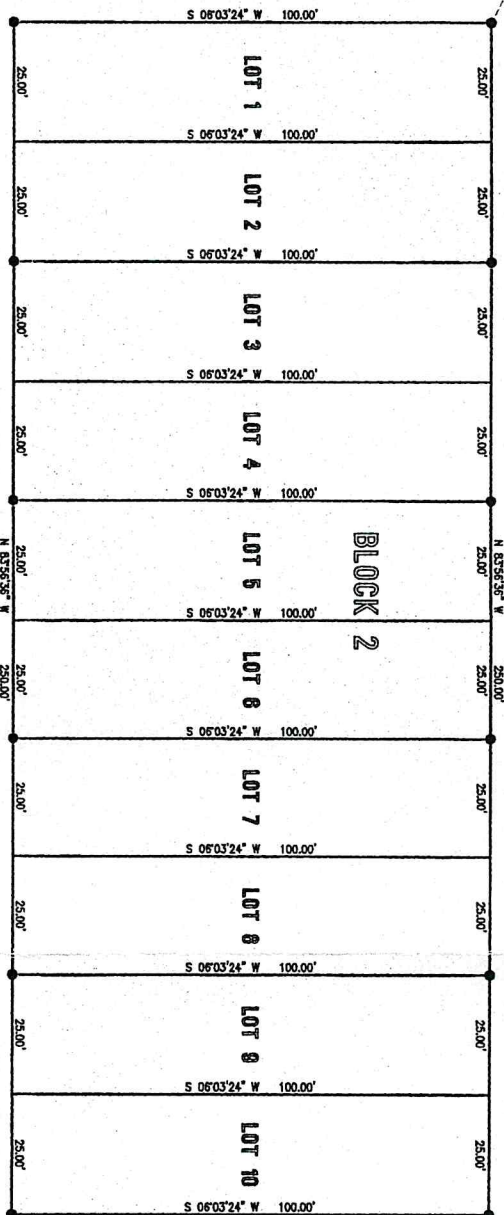
LEGEND	
●	EX. BEAM AND 1-1/2 INCH ALUMINUM CO.
○	EX. BEAM
○	FOUND BEAM AND 1-1/2 INCH ALUMINUM CO.
○	FOUND 3-1/4 INCH ALUMINUM CO. OR
○	2-1/2 INCH POST, RUM 1990

AURUM STREET

BOBTAIL STREET

ALLEY

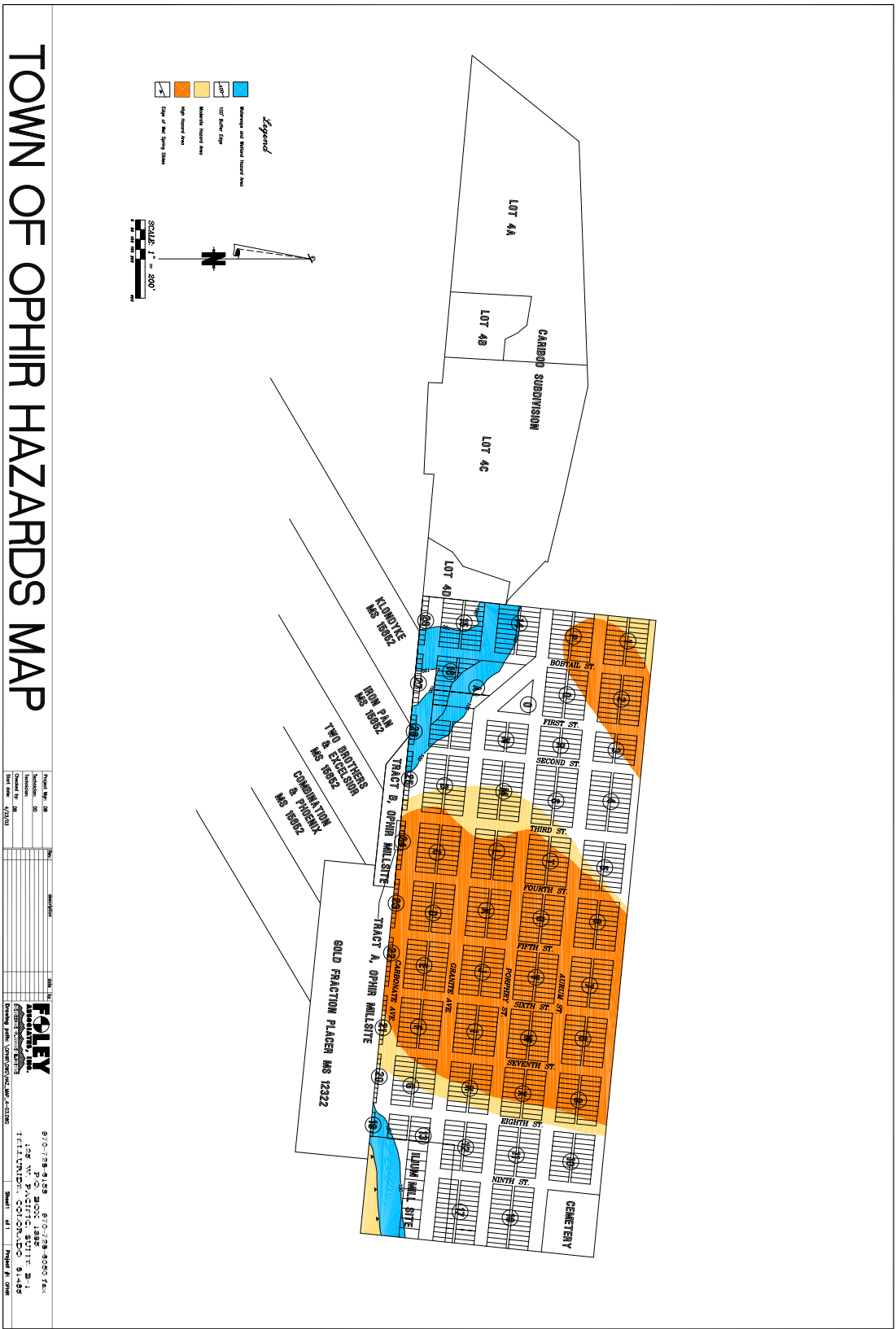
FIRST STREET



Project No.	41
Location	MC
Checked by	
Drawn by	04/28/2010
Scale	
Notes	

APPENDIX C ZONING, HAZARD AND SOURCE WATER PROTECTION MAPS TOWN OF OPHIR LAND USE CODE

\\townofophir\gis\maps\1408.2\1408.2 Hazard Map.aprx



1408.4 & 1408.5

There are not currently any specific plans for structures to be built. The intent is to sell the properties as build-able residential lots.

The intention of this application is specifically for a change to the Official Town of Ophir High Hazards Map regarding lots 1-10, block two. The applicant is not asking to change of any aspect of the current Town of Ophir Zoning Map.

6/5

OPHIR AREAINDIVIDUAL PATH DESCRIPTIONS - see Plate 9Group A (Needles Group):

These are small paths with steep rugged starting zones of less than 10 acres. Large accumulations of snow and large avalanches are not likely because of the general steepness of the paths (70 to 75 percent). However, as these paths are steep in the runout zone, avalanches probably can reach the road at fairly frequent (5 to 10 year) return periods.

Path 1:

Total vertical drop: 2600 ft
Starting zone: 20 acres
Track: Gradient 70 percent; confined to gully.
Runout zone: Gradient 26 percent; length 1500 ft.

Path 2:

Total vertical drop: 2800 ft
Starting zone: 40 acres
Track: Gradient 58 percent; confined to gully.
Runout zone: Gradient 15 percent; length 2000 ft.

Path 3:

Total vertical drop: 2800 ft
Starting zone: 60 acres
Track: Gradient 58 percent; confined to channel.
Runout zone: Gradient 16 percent; length 1900 ft.

Path 4:

Total vertical drop: 3000 ft
Starting zone: 45 acres
Track: Gradient 54 percent; confined to channel.
Runout zone: Gradient 9 percent; length 1800 ft.

Path 5:

Total vertical drop: 3200 ft
Starting zone: 30 acres
Track: Gradient 56 percent; confined to two parallel gullies.
Runout zone: Gradient 13 percent; length 1600 ft.

Group B:

These are small open-slope avalanches between Paths 5 and 6. They have small (less than 5 acres) starting zones, but steep tracks of 50 to 70 percent. They may cross the north town boundary of Ophir as either wet, dry, or powder avalanches.

Path 6 (Staatsburgh Basin):

Total vertical drop: 3700 ft

Starting zone: 75 acres

The gently sloping floor (23 percent; length 1200 ft) of Staatsburg Basin serves as the upper track for avalanches. Small to medium sized avalanches remain in the upper basin but large avalanches completely cross the basin, descend the steep slope below it, and converge with the runout zone of Spring Gulch (Path 7).

Path 7 (Spring Gulch):

Total vertical drop: 3700 ft

Starting zone: As much as 110 acres, complex with west, east and south orientations

Track: Gradient 39 percent; confined to deep channel.

Runout zone: Gradient 16 percent; length 2700 ft.

Note: This avalanches has reached Ophir at least 4 times in the last 80 years, and has moved buildings as much as 200 ft (pers. comm. R. Belisle, 1974).

Group C:

These are small channeled avalanches between Paths 7 and 8. Their starting zones are less than 5 acres, but due to their steep (60 percent) tracks, some may reach the Ophir Pass road.

Path 8:

Total vertical drop: 3400 ft

Starting zone: 45 acres

Track: Gradient 45 percent; confined to shallow, broad channel.

Runout zone: Gradient 24 percent; length 2100 ft.

Path 9:

Total vertical drop: 3400 ft

Starting zone: 45 acres

Track: Gradient 46 percent; confined to channel.

Runout zone: Gradient 25 percent; length 2400 ft.

Path 10:

Total vertical drop: 3300 ft

Starting zone: 80 acres

Track: Gradient 44 percent; confined to two parallel, shallow channels.

Runout zone: Gradient 17 percent; length 2300 ft.

Path 11:

Total vertical drop: 3200 ft

Starting zone: 115 acres

Track: Gradient 39 percent; confined to deep channel.

Runout zone: Same as for Path 12 (Chapman Gulch).

Path 12 (Chapman Gulch):

Total vertical drop: 3200 ft
 Starting zone: 120 acres
 Track: Gradient 40 percent; confined to channel.
 Runout zone: Gradient 17 percent; length 3200 ft.

Path 13:

Total vertical drop: 2400 ft
 Starting zone: 80 acres, above and below timberline.
 Track: Gradient 38 percent; confined to channel.
 Runout zone: Gradient 22 percent; length 1700 ft.

Group D:

These are small open slope avalanches which probably cannot reach beyond the south Ophir town limits.

Path 14:

Total vertical drop: 2200 ft
 Starting zone: 30 acres, above and below timberline.
 Track: Gradient 52 percent; runs in shallow channel.
 Runout zone: Gradient 5 percent; length 800 ft.

Path 15:

Total vertical drop: 3000 ft
 Starting zone: 65 acres
 Track: Gradient 52 percent; runs in shallow channel.
 Runout zone: Gradient 16 percent; length greater than 1000 ft.

Path 16:

Total vertical drop: 3200 ft
 Starting zone: 90 acres
 Track: Gradient 64 percent; runs on open slope.
 Runout zone: Gradient 20 percent; length over 1000 ft; reaches runout zones of paths of the Needles Group (Group A).

Path 17:

Total vertical drop: 2000 ft
 Starting zone: 15 acres below timberline.
 Track: Gradient 63 percent; open slope.
 Runout zone: Gradient 12 percent; length 600 ft.

Path 18:

Total vertical drop: 2000 ft
 Starting zone: 30 acres, below timberline.
 Track: Gradient 70 percent; confined to gully.
 Runout zone: Gradient 7 percent; length 600 ft.

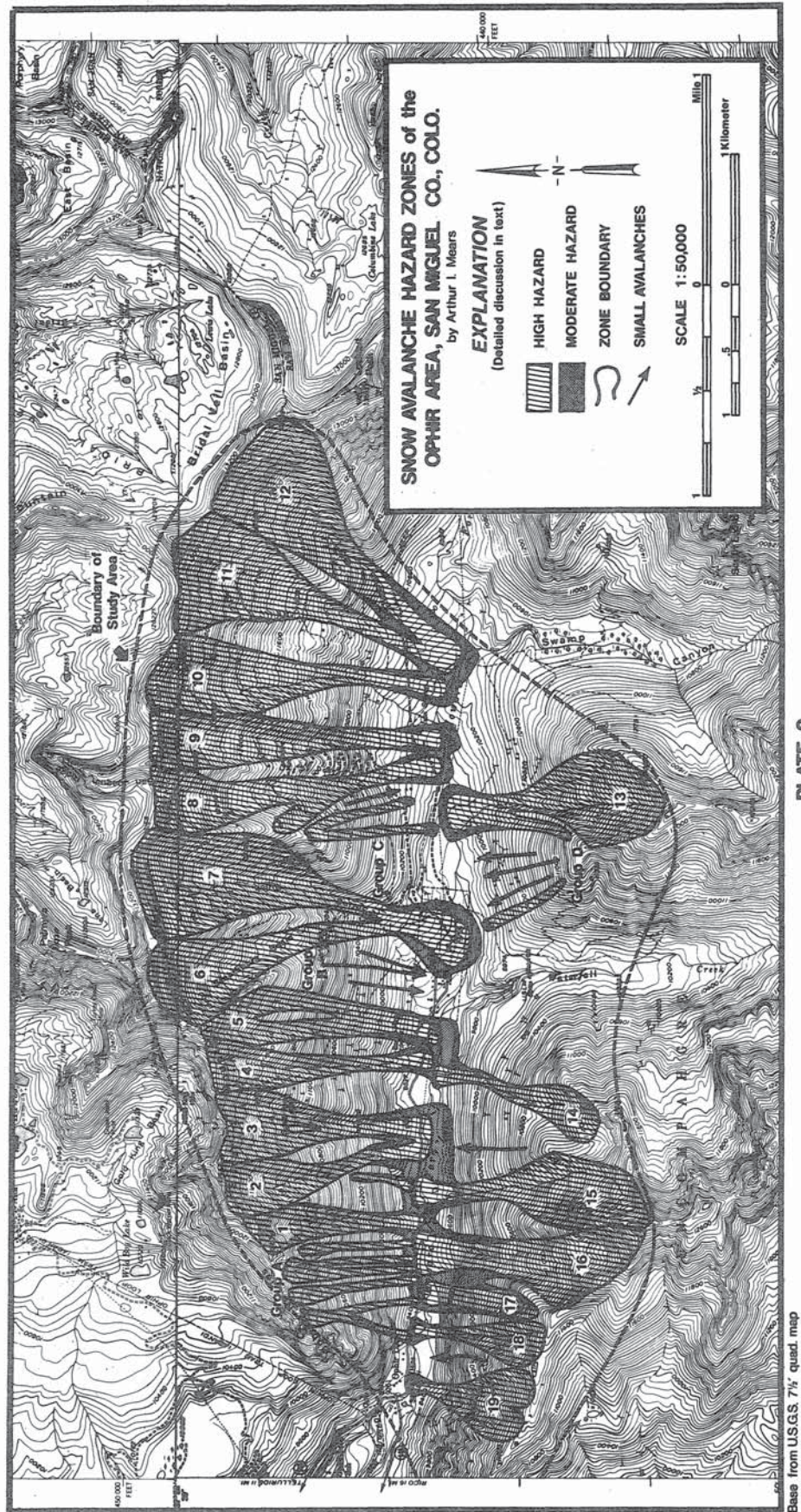


PLATE 9

NATURAL HAZARDS IN MOUNTAIN COLORADO

JACK D. IVES, ARTHUR I. MEARS, PAUL E. CARRARA, AND
MICHAEL J. BOVIS

ABSTRACT. Interdisciplinary field studies and remote sensing techniques were used to delineate mountain areas in Colorado subject to such natural hazards as snow avalanches, mudflows, rockfalls, and landslides. The old mining townsite of Ophir in the northwestern San Juan Mountains was used as a case study. Its serious snow avalanche hazard has been made even more critical with prospects of new housing developments. Techniques in remote sensing and geoecology have been applied to the solution of practical land management problems at the county and township levels of local government. The rapidly increasing hazard to human life and property results directly from accelerated growth of the winter recreation industry and construction of mountain homes. Many of the world's temperate zone high mountains urgently need development and application of new land management policies. **KEY WORDS:** *Avalanches, Geoecology, Hazards, Land management, Mountains, Remote sensing.*

THE mountain section of Colorado has experienced accelerating pressures from rapid development of the recreation industry, principally winter sports expansion and the spread of second homes. The population explosion along the Front Range urban corridor over the past ten years has induced the completion of the Eisenhower Tunnel bypassing Loveland Pass and bringing large sections of Summit, Eagle, and Pitkin counties within two to three hours' driving time of Denver; the twinning of I-70 (partially complete); and the creation of a new type of boom town, the ski resort, as exemplified by Vail.

The inflow of population has placed large numbers of people with little or no mountain experience in high mountain terrain. Land values exceed \$70,000 per acre in some of the more attractive sites, and land speculation is rife. Only a limited amount of land in the Rocky Mountains is suited for home and condominium construction. The inevitable result—a combination of speculation, ignorance, and the very speed of the development itself—has been land sales and actual construction in areas subject to a variety of natural hazards: ava-

lanche, landslide, mudflow, rockfall, and mountain flood.

Over the past three years the Institute of Arctic and Alpine Research (INSTAAR) has been seeking to develop methodologies, including a combination of remote sensing techniques and interdisciplinary field studies, to assist governmental agencies at the township, county, and state levels to alleviate this serious land management problem. The initial studies were conducted near Vail, with smaller scale studies in Telluride, Crested Butte, Silverton, and Ophir. The special situations and problems of Ophir, San Miguel County, provide an excellent case study to demonstrate the methodologies used. No new development has taken place near Ophir, and the use of these methodologies to prepare hazard maps can give local planning authorities a better opportunity to control future growth patterns. The possibilities for the success of such an approach were greatly augmented in 1974 with the passage of Colorado State House Bill 1041 which, in part, requires each county to prepare maps of land subject to a variety of natural hazards. The legislative step has been reinforced by the development of hazard criteria and definitions by the Colorado Geological Survey.¹

Dr. Ives is Director of the Institute of Arctic and Alpine Research (INSTAAR) at the University of Colorado in Boulder, CO 80302; Mr. Mears is a natural hazards consultant in Boulder; Mr. Carrara is a geologist with the United States Geological Survey in Denver; and Dr. Bovis is a Research Associate at INSTAAR.

¹W. P. Rogers et al., *Guidelines and Criteria for Identification and Land-use Controls of Geologic Hazard and Mineral Resource Areas*, Special Publica-

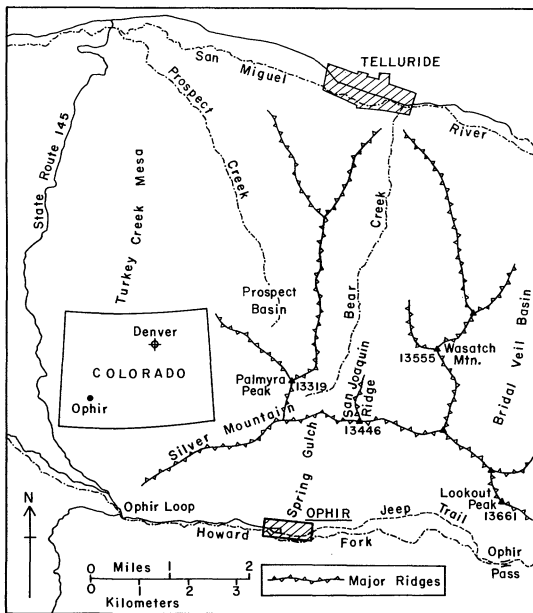


FIG. 1. Location of the Ophir-Telluride area, San Juan Mountains, southwestern Colorado.

OPHIR AND SPRING GULCH

Ophir is one of many relics of the early Colorado mining boom. During most of the present century it has remained a small, almost forgotten, group of houses with a total new migrant population of fewer than thirty persons. The town is in the northwestern San Juan Mountains at an elevation of 2,973 meters, 9.6 kilometers south of Telluride, the county seat of San Miguel County and the site of a recent ski development. Mountain ridges exceeding 3,962 meters separate the two settlements (Fig. 1). Ophir occupies part of the floor of a spectacular glaciated valley which is drained by Howard Fork, a tributary of the San Miguel River. The townsite is north of the stream on the western sector of a large alluvial fan emanating from Spring Gulch.

The main source of avalanche hazard is Spring Gulch (Fig. 2 and PLATE 1). The total vertical range of its catchment basin is 1,100 meters from the summit of Silver Mountain (4,100 meters) to the vicinity of Ophir, making it one of the largest in Colorado. The snow accumulation zone above 3,300 meters is almost entirely above treeline. Less than fifteen per-

cent of the total area is too steep to accumulate a deep snowpack. Most of the accumulation basin consists of smooth slopes with average gradients of 30° to 40° . Much of this basin could probably release simultaneously, given appropriate snow and weather conditions. These steep, smooth slopes also have many active mudflow channels and extensive areas of soil creep, indicating instability that would provide serious difficulties for any future attempt to construct supporting structures to anchor the snowpack.

Below about 3,300 meters the mass of moving snow released from the accumulation basin (starting zone) becomes concentrated into the deeply entrenched channel of Spring Gulch, which serves as the avalanche track. All avalanches, regardless of type or size, utilize this channel, which has an average gradient of 26° (45 percent) between 3,400 and 3,150 meters. Cross sections of previous avalanches have been surveyed (Fig. 3). The cross section of the April, 1973, wet snow avalanche indicates that the major powder avalanches of the past were much larger, partly because of the turbulent, high-velocity powder cloud which is assumed to have accompanied them. Measurement of broken trees along the margins indicates that the depth of the destructive moving fronts of past major events exceeded sixty meters.

The lower part of the Spring Gulch catchment basin (run-out zone) is a gently undulating alluvial fan. The undulations, with low ridges approximately perpendicular to the contours, are the result of numerous mudflows and/or debris flows. A local relief on the order of two meters is of considerable importance for wet snow avalanches, but has much less effect on dry snow events. A small stream channel extends from the apex of the fan down its western edge, and a steep-sided gully cuts into the surface east of the center line. Occasional conifers grow near the town, south of the county road, and in the upper part of the stream channel, which also contains patches of aspen and willow. Otherwise, the alluvial fan is treeless, although the eastern forest border (PLATE 1) is abruptly uneven and indicates that timber probably has been cut in the past. The color infrared air photograph gives an excellent overview of the townsite and the immediate hazards that threaten it. Coniferous forest (dark red on the photograph) can be dis-

tion No. 6 (Denver: Colorado Geological Survey, 1974).

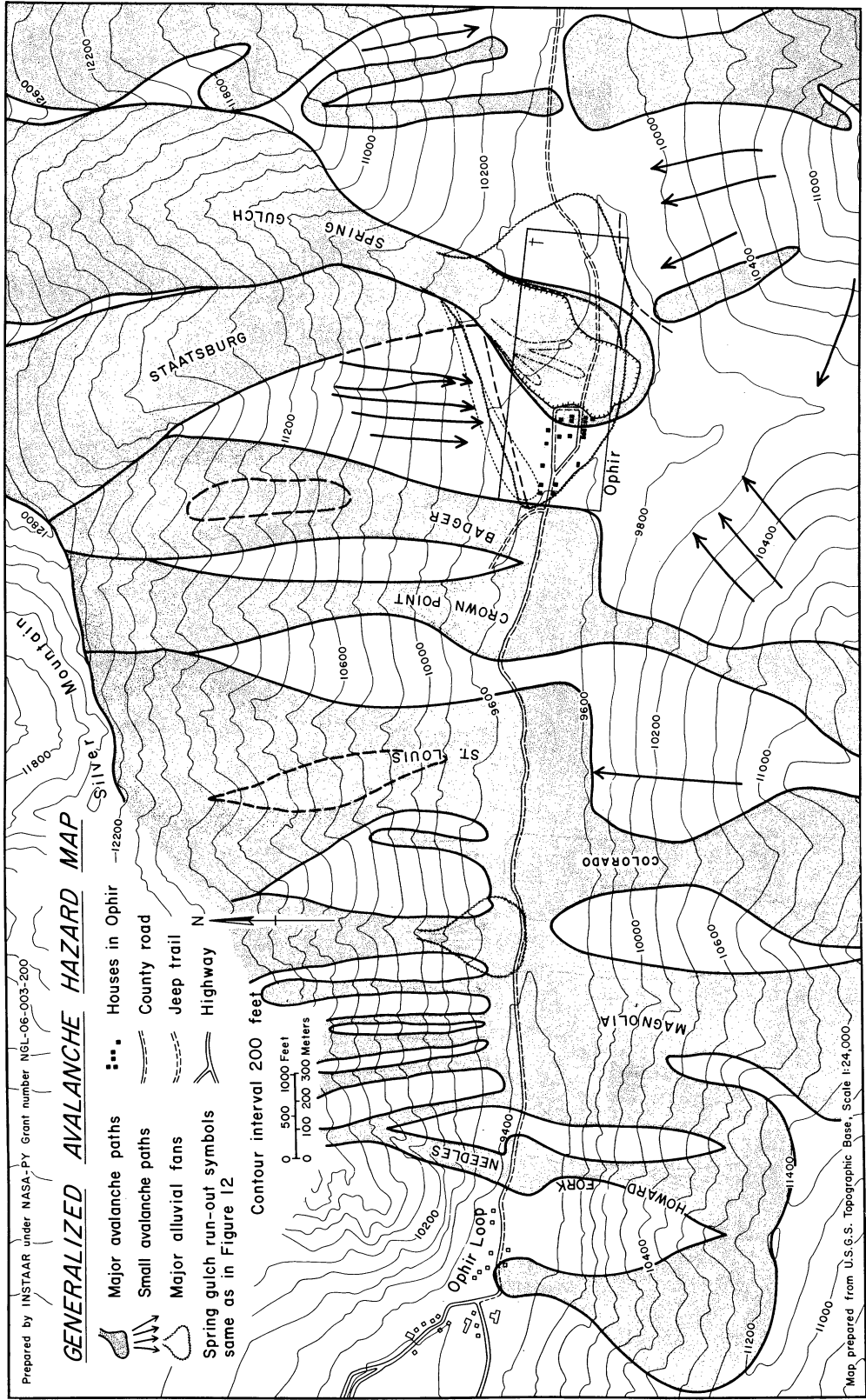


Fig. 2. Generalized avalanche hazard map of the Howard Fork Valley between Ophir and Ophir Loop. The arrows indicate location of minor paths, principally wet, spring gulches. Delineation of secondary hazard to the access road incorporates detail from work by Arthur I. Mears for the Colorado Geological Survey.

tinguished from the aspen forest cover, which should always be viewed as an indicator of potential instability. The linear patterns in the vegetation, perpendicular to the contours, are diagnostic as a preliminary sign of avalanche hazard. This type of photograph has been a vital tool in all phases of the natural hazard delineation.

The present residents have come to Ophir over the last three years. They have reincorporated the town and have formed a small but very active group of modern "mountain men" who obtain their livelihood largely by working in Telluride. In addition, the landowners, deriving their land from early mining claims, are moving to place many housing lots on the market; ski resort speculation is apparent, and thus the ingredients for serious problems in local planning are already assembled. This study was requested both by the people of Ophir and by the San Miguel County Planning Office.

THE PROBLEM

A reconnaissance of Ophir and Howard Fork Valley in September, 1974, indicated that the major hazards threatening the existing houses, and especially the undeveloped area of the platted townsite to the east, were periodic wet and dry snow avalanches from Spring Gulch. The inhabitants were also in danger from avalanches crossing the access road between Ophir and Telluride. Secondary hazards include the Waterfall Avalanche path, which ran and temporarily knocked out the town's water supply in January, 1975; a series of small avalanche paths north of the town and west of Spring Gulch; and a variety of mudflow, debris flow, rockfall, and associated problems (Fig. 2). A growing tendency for cross-country skiers to use Ophir as a car park and ski up the valley toward Ophir Pass constitutes an additional hazard not considered in the present study.

The difficulties of assessing avalanche magnitude and frequency (recurrence interval) in

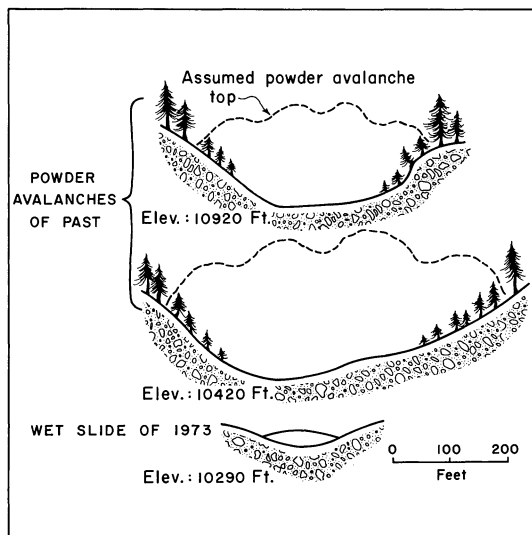


FIG. 3. Cross sections of three Spring Gulch avalanches.

areas such as the European Alps, where hundreds of years of historical data are available, are formidable.² In Colorado historical data frequently are entirely lacking, especially for Ophir, where none of the present residents has lived in the area for more than three years, although we have some information dating back to the early years of the century. Since the physical properties of snow vary rapidly in time and space, the difficulty of predicting avalanche size is basically a problem of inadequate snow mechanics theory. Two main forms of torrential snow mass movement must be considered: dry powder avalanches, sometimes accompanied by an airborne powder cloud, that

² H. Aulitzky, "Endangered Alpine Regions and Disaster Prevention Measures," *Nature and Environment*, No. 6 (Strasbourg: Council of Europe, 1974); H. Frutiger, *The Avalanche Zoning Plan*, Translation No. 11 (Alta, Utah: U. S. Forest Service Alta Avalanche Study Center, 1970); and O. Voellmy, *On the Destructive Force of Avalanches*, Translation No. 2 (Alta, Utah: U. S. Forest Service Alta Avalanche Study Center, 1964).

PLATE I. Color infrared photograph taken from 70,000 feet as part of a NASA underflight mission in support of LANDSAT I. The townsite of Ophir, Spring Gulch, and the alluvial fan are conspicuous. Aspen and coniferous forest and vegetation trimlines emphasize the avalanche paths. A recent mudflow, which originated right of center, has swept down the gulch east of Spring Gulch and run along the bed of Howard Fork. (Enough reproductions of this photograph for insertion in each copy of this issue of the *Annals* were provided under the auspices of NASA Grant NGL-06-003-200 without cost to the Association of American Geographers.)



may travel up to 120 m/sec (250 mph); and wet snow avalanches that travel much more slowly (up to 22 m/sec, or 50 mph), but also produce formidable pressures in the run-out zone.³ Assessment of hazard must consider the maximum possible run-out zones both of wet and of dry snow avalanches, recurrence intervals, and probable pressures in the run-out zone. Two extreme cases would be one in which an avalanche discharges at least once each winter and one in which infrequent occurrence—perhaps less than once in 100 years—even allows reforestation of the track and run-out zone. The first should be so self-evident that it is usually avoided automatically, but the second type may escape recognition. Serious loss of life and property may result in areas such as Colorado, which have rapid population growth and few historical data. On the other hand, the indirect methods of prediction, if indicating a recurrence interval of more than 100 years, may limit otherwise usable land and will probably be more difficult to maintain in a legal action, given the obvious margin of error in interpretation of the field data. The concept of the 100-year avalanche (best described as a one percent chance of an avalanche in any one year) has not yet remotely attained the legal and planning respectability of the 100-year flood.

This study used indirect and direct field methods, applied available, albeit imperfect, flow laws, and used any historic data that could be collected from interviews with local residents. To the problems of determining the magnitude and frequency of natural catastrophic events must be added the challenge of translating the research results into meaningful recommendations so that the responsible decision-makers can improve mountain land management within the limits set by the democratic process of local government. We recognized that snow avalanches were the major source of hazard facing Ophir. Although other natural hazards, including mudflow, debris flow, rockfall, and mountain flood, are present, major emphasis had to be placed on the determination of avalanche magnitude and frequency.⁴

³ M. Mellor, *Avalanches*, Monograph A-IIIId (Hanover, New Hampshire: U. S. Army Cold Regions Research and Engineering Laboratory, 1968).

⁴ NASA EROS underflight imagery, false color, flown at high altitude (20,000 meters) in support of

TYPES OF AVALANCHES

The types of avalanches in Spring Gulch differ greatly in extent, velocity, flow characteristics, and mechanics of impact, and they must be considered separately if defense structures and new habitations are to be planned.

Wet Snow Avalanches

Wet snow avalanches have a density of 300 to 400 kg/m³, although they may attain maximum velocities of 22 m/sec in the main gully of Spring Gulch. Because of their relatively low velocities, they tend to follow irregularities in the terrain fairly closely and are more easily controlled in the run-out zone than are dry snow avalanches. Nevertheless, the paths of wet snow avalanches are less predictable because channel blockage by the debris itself can cause lobes to break out into entirely new courses. Wet snow avalanches can also produce high impact pressures and could conceivably reach any section of the Spring Gulch alluvial fan. Three houses in Ophir have been moved by such events.

Dry Snow Avalanches

An avalanche of mixed dry flowing and powder snow is the most dangerous and destructive type emerging from Spring Gulch. It is also the most difficult to control. It occurs as large releases of cold, dry snow, generally in midwinter, and consists of two parts. A lower part, with a density of 60 to 90 kg/m³, tends to follow terrain irregularities and probably attains velocities of up to 90 m/sec in the avalanche track. These velocities will drop fairly rapidly in the run-out zone because of the great reduction in gradient. The widespread open ground encourages the flowing snow mass to extend laterally and become more shallow. High velocity in the gully, however, creates a low density, high velocity suspension of snow and ice particles which is called the powder cloud. Its density probably ranges between 2 and 10 kg/m³. Damage to tree limbs on the sides of Spring Gulch apparently was caused by this portion of past avalanche events, indi-

LANDSAT-1 (ERTS-1) imagery interpretation projects, was the principal tool used for mapping the more conspicuous physical features and the significant vegetation cover types. Maps thus generated were then used during fieldwork, together with the USGS 1:24,000 topographic map series and the air photo interpretation maps.



FIG. 4. Mature conifers at the extreme limit of the Spring Gulch run-out zone have been trimmed by the impact of the powder cloud of fast-moving snow and air blasts (photo by Jack D. Ives).

cating a flow depth of at least sixty meters. Although the powder cloud will also tend to widen and decelerate on the alluvial fan, it can overtake the denser body of flowing snow, completely cross the fan, and damage mature coniferous trees on the south side of Howard Fork, a full 800 meters from the mouth of Spring Gulch (Fig. 4).

DENDROCHRONOLOGY AND DEBRIS

The avalanche paths themselves are rendered conspicuous on the air photographs and in the field by major vegetation differences resulting from the magnitude and frequency of avalanche occurrence (PLATE 1). An idealized cross section of the middle reaches of an avalanche path has an inner zone of alpine plants, or aspen and willow, where avalanches are frequent and relatively small; an intermediate zone of destroyed mature trees with seedlings or saplings of either conifers and/or aspen where avalanches are less frequent and larger; and an outer undamaged zone of mature conifers (Fig. 5). The outer edge of the undamaged mature stand is usually trimmed by the rare major avalanche. The height of snapped limbs can be used to calculate the cross section of the major event, the marginal pressures generated, and the maximum horizontal spread if the edge of the run-out zone has mature stands.

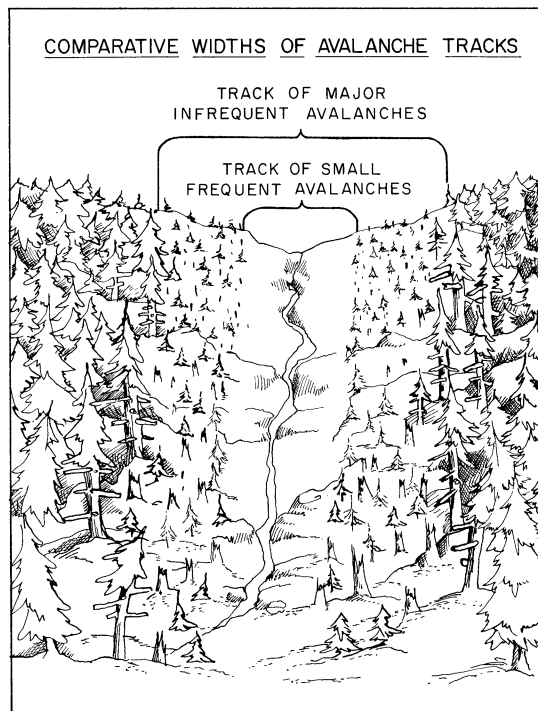


FIG. 5. Idealized mid-track cross section of an avalanche path showing vegetation trimlines.

This idealized description is frequently developed in the field to a sufficient degree to facilitate the application of standard dendrochronological methods.⁵ Scars, discernable in cross section or increment core, are produced by physical damage to the tree, including breakage of limbs. In addition, the occasional pressure against trees at the edges of the avalanche path may bend rather than break limbs and stem. A bent coniferous tree forms reaction wood (compression wood) on the down-slope side and frequently has compressed tree rings on the upslope side. The reaction wood in conifers is reddish yellow and shows thick walled cells under the microscope (Fig. 6). Ring compression was not observed in aspen, but reaction wood is common and has a dark red-brown color.

Several natural limitations in the Ophir area restricted the collection of data through application of these principles. The primary limitation is the age of the tree itself. Coring of En-

⁵ N. Potter, Jr., *Tree-ring Dating of Snow Avalanche Tracks and the Geomorphic Activity of Avalanching, Absaroka Mountains, Wyoming*, Special Paper No. 123 (Boulder, Colorado: Geological Society of America, 1969).

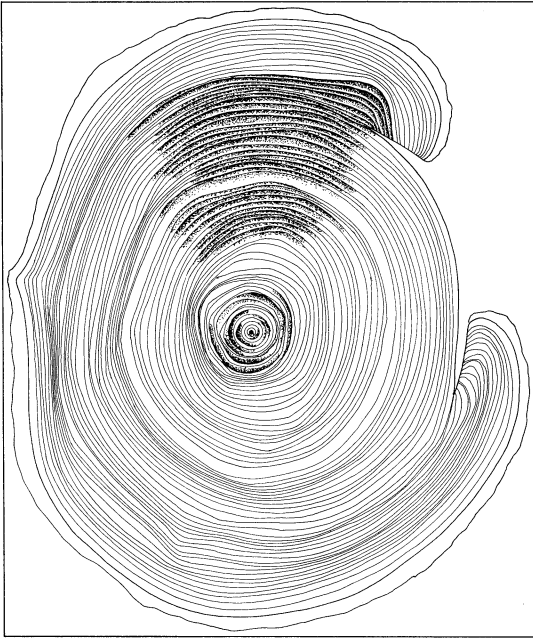


FIG. 6. Diagram of cross section of conifer showing avalanche impact damage and reaction wood. The inner zone of reaction wood, produced while the tree was very young indicates bending in several directions. The gap on the right side faces the avalanche track and was caused by bark abrasion. The overgrowth is slowly healing the wound which occurred 19 years before the section was cut. The main area of reaction wood towards the top of the section resulted from avalanche impact, the point of the impact being on the opposite (bottom) side. This shows one-direction bending since the tree had become strong enough to resist bending in all directions except the main one.

gelmann spruce (*Picea engelmannii*) in the avalanche-damaged forest area southeast of Ophir revealed that most dated from the turn of the century. A few were more than a hundred years old, although there were insufficient numbers of these to provide data with a high level of statistical significance. Trees were also cored in reforested areas at the bottom of Spring Gulch which have several aspen (*Populus tremuloides*) trimlines but, again, age of the trees limited the historical record. The other major limitation was the general absence of trees on the main part of the Spring Gulch fan. Thus, allowance must be made for the possible occurrence of quite large avalanches (which could cover much of the townsite) that left no record in the forest stand at the extreme edge of the run-out zone.

These applications indicated that the forested area southeast of Ophir was struck by a



FIG. 7. Avalanche debris on the Spring Gulch fan. This photograph gives a graphic impression of the proximity of the existing settlement of Ophir to avalanche activity (photo by Jack D. Ives).

large avalanche in the late 1950s. The damage indicates a dry powder avalanche, which suggests the January event of 1958, rather than the wet slide of April, 1959, known from reports of local residents. An avalanche in the early 1950s is evident in several trees northeast of the town, but the recorded avalanche of January, 1951, although large, apparently did not cross Howard Fork.

Trees cored in a control forested area show no recent avalanche damage, yet indicate disturbance in the middle to late 1880s and possibly in the early 1860s. Few trees cored possess a tree ring record that extends back this far, but it appears that avalanches from Spring Gulch crossed Howard Fork at least once and possibly twice in the latter half of the nineteenth century.

A histogram showing the number of disturbances (compressed rings and reaction wood) noted in the tree ring analysis has been weighted to account for the fact that many trees did not have an early tree ring record. No tree ring evidence indicated the avalanches of 1918 and 1959 which ran close to Ophir. Evidently these avalanches did not run across Howard Fork to be recorded in the tree ring record. Other avalanches also may have gone unrecorded because of the lack of forest.

Finally, tree and rock debris scattered across Spring Gulch fan (Fig. 7) were mapped sys-

tematically, since their distribution provides good evidence for the minimum extent of avalanche activity. Such debris, however, is probably the result of multiple events: debris may not necessarily be carried all the way to the extreme end of the run-out; and tree debris may be absent from some areas because of disturbance by man. Nevertheless, useful supplementary data were obtained and used in the compilation of the hazard maps (Figs. 2 and 10).

HISTORICAL DATA

Old photographs, newspaper files, and the recollections of long-term residents add confidence to the indirect evidence, but this type of data also must be used with caution, since human recollection of events can give indications larger than reality; remembrance of actual dates can be particularly faulty. Convergence of different types of evidence becomes a valuable test of reliability, and in Ophir such convergence indicates a high degree of accuracy in reconstruction. Mr. and Mrs. Randolph Belisle, long-term residents of the area who currently live at Ophir Loop, say that avalanches from Spring Gulch have reached the vicinity of Ophir four times in the last fifty-six years. Large wet slides reached the town during May, 1918, and April, 1959, and dry snow avalanches approached the town in midwinter 1951 and in January, 1958. The 1958 event crossed the creek at the extreme edge of the alluvial fan and hit mature trees, causing damage to limbs. Snow accumulated in mid-fan to the height of the telephone poles (nine meters). Mr. Fred Eanes, a present Ophir resident, reported that a moderately large wet snow avalanche from Spring Gulch in April or May, 1973, split into three lobes; one ran to within 100 to 200 meters of the existing houses. Since this avalanche is the best known to the present residents, it provides a useful base for comparison with larger events of the past. The relative size of the track cross sections indicate that the destructive front of the 1973 event, as it passed through the lower gully of Spring Gulch, was small in comparison with past events, but wet snow deposits on the upper and middle part of the fan were up to ten meters deep (Fig. 3).⁶

⁶ Fred Eanes, personal communication, February, 1975.



FIG. 8. Photograph taken about 1950 showing how major avalanches cross the access road between Ophir and Ophir Loop (photograph by Mrs. Randolph Belisle).

Mrs. Belisle was also able to provide information on the avalanche paths that threaten the access road. They may be expected to cut the road every three to four years (Fig. 8). The present residents had their first experience with this phenomenon in January, 1975, when the road was buried in at least four places by the Howard Fork, Magnolia, St. Louis, and Badger avalanche paths (Fig. 2); the Colorado avalanche reached the edge of the road, as did the Needles avalanche, while the Butterfly and Terrible ran out onto the highway west of Ophir Loop. This type of hazard is significantly more severe today with daily movement between Ophir and Telluride than it was fifty years ago, when the residents were more or less closed in for the winter. The historical record is impressive enough, but other large avalanches may have gone unnoticed if their debris was covered by new snow during mid-winter snowstorms.

FREQUENCY OF LARGE AVALANCHES

Historical data indicate that four avalanches have either reached or closely approached Ophir during the last fifty-six years. Tree ring analysis substantiates and reinforces this recollection of local residents. From a combination of the two lines of enquiry, the broad picture of avalanche activity has been put together

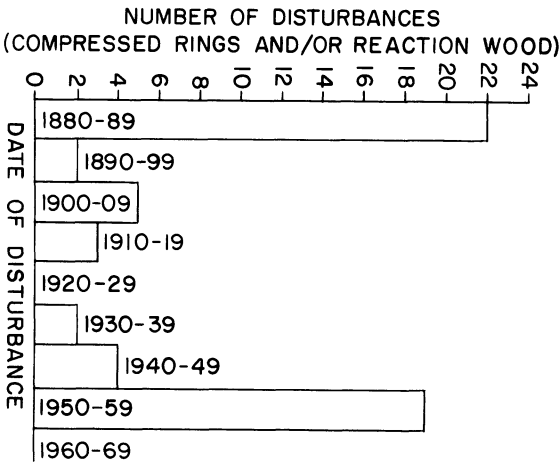


FIG. 9. Frequency of avalanche occurrence as interpreted from the tree-ring record.

(Fig. 9) as the basis for subsequent recommendations on land management.

Powder avalanche impact on trees in the run-out zone, south of Howard Fork, occurred in the late 1850s and probably in the middle to late 1880s. Two cores suggest avalanche impact south of Howard Fork in the early 1860s. Young, uniformly aged aspen stands on the lateral track boundaries between 3,200 and 3,300 meters elevation are fifteen to twenty years old. They correspond to the lateral flow boundaries of the avalanches of the late 1950s, which were considered large since they reached the town limits. Avalanche damage and trim-lines extending farther up the sides of the gully indicate that Spring Gulch has run much larger in the past.

When the historical and tree ring records are combined, there is substantial evidence for six major avalanches, all capable of reaching Ophir (1860?, 1885, 1918, 1951, 1958, 1959), in the last 114 years. We conclude an average recurrence interval of approximately twenty years, indicating a five percent probability of occurrence in any one year. The total number of events and the length of the record weaken any statistical approach, but, as a first approximation, we argue that the conclusion is highly relevant to land use decision-making. In addition, the Spring Gulch fan has no forest cover, so that the six avalanches identified represent a minimum number of occurrences. The 1918 and 1959 avalanches are not revealed in the tree ring record. Evidently they did not run out across Howard Fork into the forested

area. The very absence of trees on the fan itself is an indicator of a geomorphologically active environment, although some timber may have been cut, especially along its eastern margin.

EXTENT AND IMPACT PRESSURE OF RUN-OUTS

Mapping of debris and damage to living trees, historical data, and dendrochronology give good indications of the frequency of avalanche occurrence. They also assist in delineation of the extent of the run-out zone and in calculation of impact pressures. As a further cross check, the extent was calculated mathematically by using Voellmy's equations of avalanche flow, which are applicable to dense, flowing avalanches, both wet and dry.⁷ They do not consider lateral spreading in diffuse powder avalanches of great height, so we used independent methods to calculate the forces associated with the high velocity powder head which accompanies dry powder avalanches in Spring Gulch.⁸ Additional modifications were made to Voellmy's approach following the work of Schaerer.⁹ The basis for these computations, however, is an expression derived by Voellmy equating avalanche kinetic energy with frictional work, viscous energy dissipation, turbulent energy dissipation, and potential energy, solved for calculating run-out distance. To check the applicability of the Swiss work to Ophir, the run-out distance was measured in the field to coincide with the outer limit of timber destruction on the south side of Howard Fork. This agreed very well with the computed figures.

The next step was to calculate impact pressures across the run-out zone. It was necessary to estimate the deceleration of the flow as it crossed the fan. For the powder avalanches, the velocity at the top of the fan was calculated using Voellmy's equations, and the velocity at Howard Fork was calculated from observed impact effects on mature trees.¹⁰ We assumed that velocity decreased between these two points proportionately. The velocity remaining

⁷ Voellmy, op. cit., footnote 2. In practice, modifications were made to Voellmy's approach. Any one who would like a detailed explanation should write to the senior author.
⁸ Voellmy, op. cit., footnote 2.
⁹ P. A. Schaerer, personal communication, 1975.
¹⁰ Voellmy, op. cit., footnote 2.

at the bottom of the run-out was calculated by assuming that the flow was nine meters (\pm one meter) deep as it hit the trees. This figure was obtained by measuring impact trimming of limbs. The velocity was assumed to have a logarithmic velocity profile, as is common in turbulent shear flow. Diameters of broken trees compared with adjacent surviving trees provided data for derivation of impact pressures, again using Voellmy's methods.¹¹ We took the conservative approach of assuming that trees failed by "static" rather than by "dynamic" loading.

An alternate method calculated the velocity through simple conservation of energy. The kinetic energy per unit of flowing mass is $\frac{1}{2} V^2$. This is transformed into potential energy gained, gh , friction work, $(g \cos \theta)\mu d$, flow work, and drag on surrounding air, where h is the height climbed, θ the average slope angle, μ the coefficient of friction, d the slope distance, and g the acceleration caused by gravity. If flow work and drag are assumed small as the avalanches climb the slope south of the Howard Fork, then

$$\frac{V^2}{2} = gh + (g \cos \theta)\mu d.$$

The distance, d , was measured as 75 meters in the field, h is 13.5 meters, θ is 13° , and μ is assumed to have been 0.5. The velocity calculated in this manner is 31 m/sec.

The two methods give velocities at the Howard Fork of approximately 30 to 50 m/sec if dynamic loading is assumed, and 30 to 65 m/sec if static loading is assumed. If an average velocity of 45 m/sec is taken and a velocity of 100 m/sec is calculated at the top of the fan, then a velocity decay between these points can be obtained. The velocities calculated in this way were converted to impact pressures, P , through the relationship

$$P = \frac{1}{2} \frac{\gamma}{g} V^2$$

where γ is the density, in order to subdivide run-out hazard maps into two zones of impact pressure.

These calculations and a plot of the debris distribution were combined for construction of preliminary hazard maps. Subsequent discussion with local residents, examination of winter

field conditions, and collection of more detailed information on the location of wet snow avalanche lobes led to modifications and the production of the final maps (Figs. 2 and 10).

The final avalanche hazard maps follow the traditional Swiss and Austrian approach and show three zones of intensity.¹² In Zone I, avalanches will occur every twenty years or less and produce impact pressures greater than 3 t/m².¹³ Zone II will have avalanches with a recurrence interval greater than twenty years and with impact pressures below 3 t/m². Zone III is considered free of avalanche hazard. Any method of avalanche prediction has built-in uncertainties and limitations, but combining them in hazard assessment maps provides a reasonable first approach. This approach should be supplemented by a coordinated program to observe and survey avalanche events.

The avalanche run-out zones that cross the access road from Ophir to Ophir Loop have not received the detailed attention given to Spring Gulch. The run-out zones as plotted present a conservative viewpoint, and the recurrence interval of three to four years, based upon Mrs. Belisle's recollection, is short enough to emphasize that a considerable hazard exists, but it is an entirely different hazard from that facing houses. A house needs to be hit only once with its owners inside for danger to life and property to be high. Avalanches may cross the access road many times with little chance of hitting a vehicle, and inconvenience is the more probable result. Nevertheless, the hazard will grow in proportion to any increase in population, so that development of effective land management policies is vital.¹⁴

PLANNING RECOMMENDATIONS

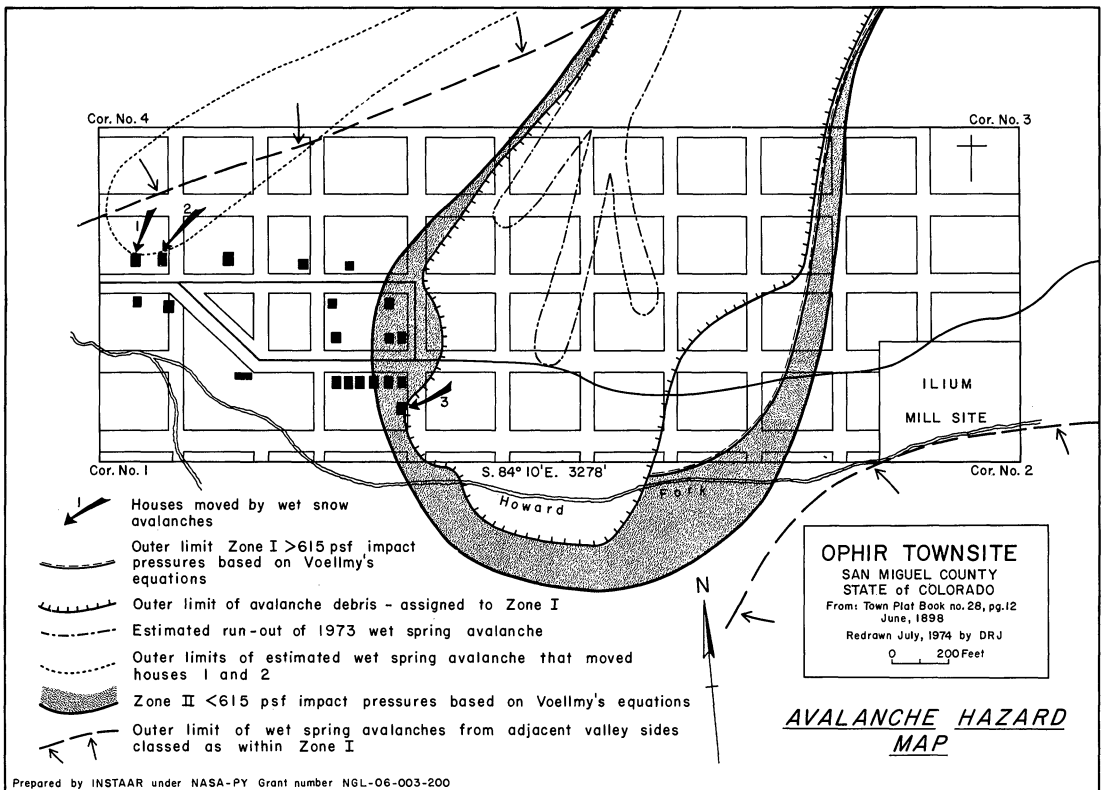
We recommend that no construction be permitted within Zone I on the avalanche hazard maps. Any new buildings in Zone II, south of Howard Fork, where damage is primarily the result of powder avalanches, should be designed to withstand 3 t/m² impact loading. The

¹² Aulitzky, op. cit., Frutiger, op. cit., and Voellmy, op. cit., footnote 2.

¹³ The Swiss Federal Government prohibits construction at pressure above 3.0 metric tons per square meter (t/m²) = 615 psf.

¹⁴ E. R. LaChapelle, *Encounter Probabilities for Avalanche Damage*, Miscellaneous Report 10 (Alta, Utah: U. S. Forest Service Alta Avalanche Study Center, 1966).

¹¹ Voellmy, op. cit., footnote 2.



uplift force of the aerodynamic loading must also be considered. Wind blast from powder avalanches may also occur close to the indicated run-out limits, and even pressures less than 0.5 t/m^2 are potentially destructive for normal buildings. Windows, for instance, should not face the apex of the Spring Gulch alluvial fan. The other areas of Zone II indicate a recurrence interval greater than twenty years and diminished impact pressures, although the same building restrictions should apply.

Dry and wet snow avalanches originate on the aspen-covered slope just west of Spring Gulch and on the hillside southeast of the town. We recommend that consideration be given to the feasibility of evacuating the threatened section of the town of Ophir at times of extreme danger from large wet snow avalanches from Spring Gulch unless defense measures are undertaken. A successful evacuation policy will depend upon improvement in current forecasting. Although much progress has been made in predicting the timing of wet

snow avalanches, based upon recent work in the Red Mountain Pass-Silverton area on the far side of Ophir Pass, much more is required before a practical evacuation scheme can be developed.¹⁵ Finally, there is some undeterminable possibility that an even larger avalanche in the future will sweep through most of the existing built-up area. In the absence of historical evidence for an event of this magnitude, we are dealing with an extremely long recurrence interval that cannot be incorporated into any realistic land use policy.

For reduction of existing hazards that threaten Ophir, six standard mitigation approaches should be considered.

Warning and Evacuation: Local residents might be evacuated before a major avalanche if

¹⁵ R. L. Armstrong, E. R. LaChapelle, M. J. Bovis, and J. D. Ives, *Development of Methodology for Evaluation and Prediction of Avalanche Hazard in the San Juan Mountain Area of Southwestern Colorado*, Occasional Paper 13 (Boulder, Colorado: Institute of Arctic and Alpine Research, University of Colorado, 1974).

competent local observers are available, but a successful evacuation program depends upon the credibility of the scheme to the local residents. Prediction is extremely difficult and, with a recurrence interval of twenty years for major events, the Austrian and Swiss experience would indicate that a high degree of success is unlikely.

Explosives: Control of avalanching snow by explosives is widely practiced at ski resorts and along highways. The run-out zones are evacuated before release. This system is not used for built-up areas, because permanent buildings cannot be moved from run-out zones, and controlled releases are sometimes much larger than anticipated. These methods would pose complex legal problems in the event of property damage or personal injury.

Structures in the starting zone: Such structures have been used in the Alps with some success, although there is virtually no experience in the United States with large-scale structural control in the starting zone, and in addition, costs would probably exceed \$200,000 per acre of defense structure.¹⁶

Structures in the run-out zone: Dense, low level avalanches, both wet and dry, may be controlled by placing obstacles in the run-out zone to dissipate avalanche energy or to deflect the flow. These structures are largely ineffective against high velocity dry snow avalanches, especially when accompanied by an airborne cloud, but wet snow avalanches are the greatest hazard to the existing houses. The most promising structure would be a large earthen dam designed to split the flow 150 to 300 meters northeast of Ophir. This dam might be combined with an array of earthen mounds to dissipate the flow energy and with an afforestation program (Fig. 11). An alternative approach, which could also be used in conjunction, would be to barricade the mouth of the small stream channel running down the western margin of the fan. Such a barricade could deflect wet snow avalanches down the fan's center line.¹⁷

Protection structures for individual buildings: Special building design has proved effective in the Alps when individual buildings required protection. Such structures are designed to withstand high impact pressures or to split

the flow of snow, but diverted snow may damage adjacent, closely spaced buildings in a town. Nevertheless, development of new individual buildings in Ophir may produce candidates for such an approach.

Afforestation: Extensive afforestation of the Spring Gulch alluvial fan northeast of the existing buildings could be beneficial. Such a scheme should be used only in conjunction with earthen deflecting structures, and would render them more acceptable esthetically. Afforestation is used primarily in the avalanche starting zones. Large avalanches may sweep away a forest in the run-out zone which does not have adequate earthen structures, and the ram effect of the tree trunks carried down with the slide may increase the damage.¹⁸

An additional and obvious alternative is to do nothing, let avalanches occur, and accept the risk. This risk may be approximated statistically through the concept of "encounter probability."¹⁹ For instance, if an avalanche has a recurrence interval of twenty years and a building in its path has an estimated life of forty years, there is an eighty-six percent chance that the building will be hit by an avalanche once during its life. If it is occupied by one family for ten years, that family has a thirty-nine percent chance of being hit. The probability of impact carries the possibility of death or personal injury. Also, it is one thing to adopt a "do nothing" policy for buildings which have stood for many years, but quite another to permit erection of new buildings. Future construction should be vigorously controlled by the county planning authorities.

CONCLUSIONS

The Alpine countries are experiencing a rapid acceleration in the rate of avalanche and other hazard-induced death, injury, and property damage.²⁰ This accelerating loss, and the concomitant increase in expenditures for protection, is a result of a rapid growth in population based primarily upon modern two-season tourism which has become characteristic of high mountains in temperate latitudes.²¹ The

¹⁸ Frutiger, op. cit., footnote 2.

¹⁹ LaChapelle, op. cit., footnote 14.

²⁰ Aulitzky, op. cit., footnote 2.

²¹ This phenomenon has been identified as a major study area under the UNESCO Man and the Biosphere Programme (MAB). MAB Report 14: Programme on Man and the Biosphere, Working Group on Project 6:

¹⁶ H. Frutiger, personal communication, 1975.

¹⁷ Fred Eanes, personal communication, 1974.

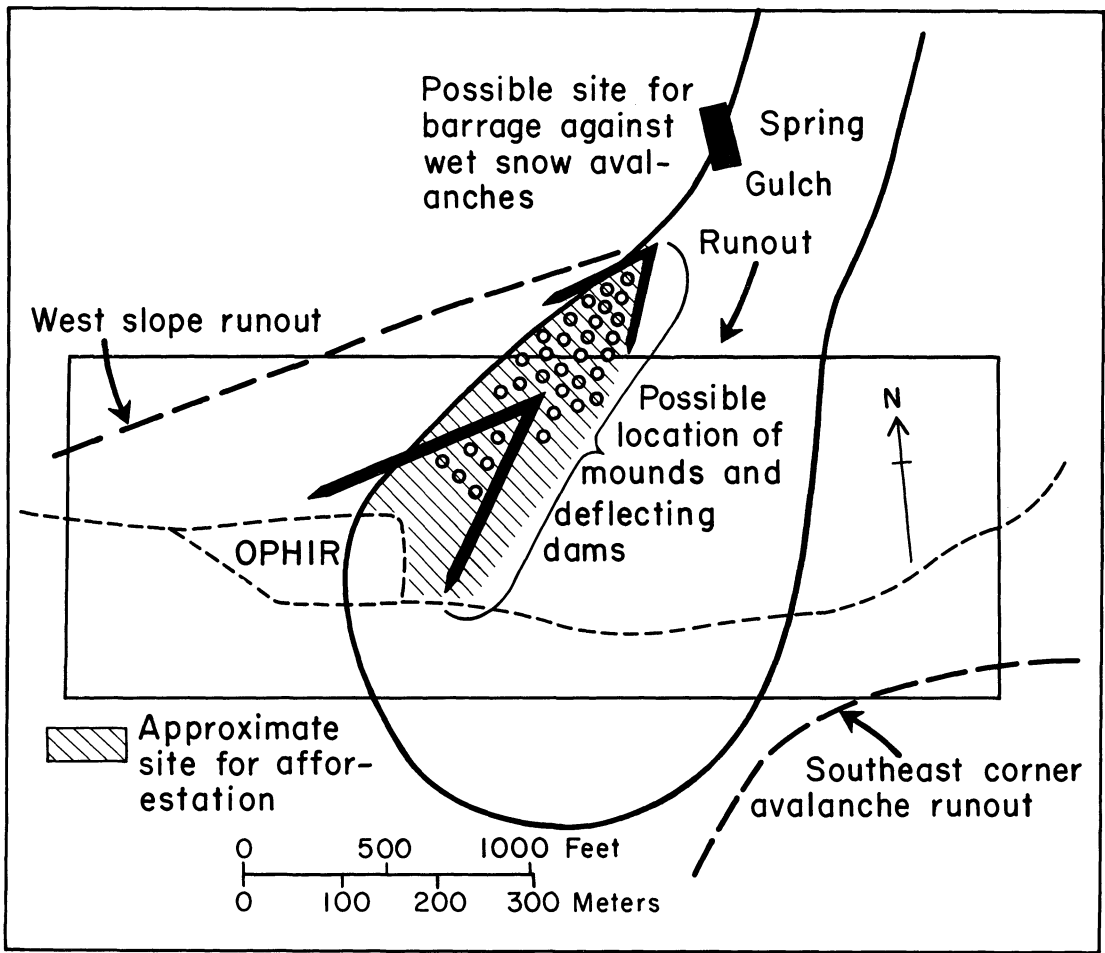


FIG. 11. Projected outline of avalanche defense possibilities for Ophir. Any detailed planning would require an in-depth engineering site survey.

phenomenon is acute in the Alps; it is becoming acute in Colorado and other parts of the North American mountain west. Natural hazard mapping, now in its infancy, still awaits development of prototype thematic maps at different scales—the general scale of 1:24,000 or 1:50,000, and the site scale down to 1:1,000. There is also the opportunity for application of remote sensing techniques, particularly NASA-LANDSAT underflight imagery interpretation. Satellite imagery should be useful for rapid reconnaissance mapping at scales of 1:100,000 to 1:500,000 for the state as a whole. Such highly generalized maps, although

of little direct value for site survey and design, would delineate critical areas and provide a powerful tool for assault on another associated and complex problem: public awareness.

Another major problem is establishment of criteria for designation of the 100-year avalanche run-out zone—the analogue of the 100-year floodplain—for planning and legal purposes. The solution of this problem would be facilitated by systematic collection of data relating to avalanche events. A start could be made through the training of local volunteers for recording size, type, and date of avalanche events; additional mountain weather observation stations would also be useful. Finally, detailed mapping and derivation of hazard maps for individual communities such as Ophir would

Impact of Human Activities on Mountain and Tundra Ecosystems (Lillehammer, November 20–23, 1973), Final Report (Paris: UNESCO, March 20, 1974).

assist in the identification of alternate building sites.²²

ACKNOWLEDGMENTS

We are indebted to Joseph Vitale of the NASA Office of University Affairs, monitor of Grant No. NGL-06-003-200 to the senior author. His enthusiasm and encouragement have been invaluable. Mark Frauhiger, County Planner, San Miguel County, was largely responsible for the initiation of the project. The residents of Ophir and vicinity have provided hospitality and historical data, and have offered to become Colorado's first volunteer avalanche observer team; this study is dedicated to them and their children. Paula V. Krebs, INSTAAR research ecologist, established the dendrochronological approach, and Hans Frutiger and

Edward LaChapelle have provided advice and encouragement in the development of INSTAAR's applied mountain geocology program.

Throughout the development of INSTAAR's work under the NASA-PY grant—Application of Space Technology to the Solution of Land Management Problems in Montane Colorado—numerous graduate students and staff members have assisted and thereby have strengthened the research base for the present paper. These include Jim Clark, D. M. Glenn, D. P. Groenveld, R. F. Madole, Janet Nichol, Betsy Palmer, Marith Reheis, D. R. Sharpe, and L. D. Williams. The cartography was undertaken by Marilyn Joel.

The work was inspired by the UNESCO MAB—Project 6. The senior author, in particular, has benefitted from the infectious enthusiasm of Francesco di Castri and Gisbert Glaser of the UNESCO MAB Secretariate, Paris, and of Donald King, U. S. Department of State, Chairman of the U. S. National Committee for MAB.

²² The work described here has been identified as part of the United State's contribution to the UNESCO Man and the Biosphere Program (MAB), Project 6: Impact of Human Activities on Mountain and Tundra Ecosystems.

AVALANCHE MAPPING AND HAZARD ANALYSIS

PAULS PROPERTY, OPHIR AREA

SAN MIGUEL COUNTY, COLORADO

Prepared For

Mr. Glen Pauls

Prepared By,

Arthur I. Mears, P.E., Inc.

Gunnison, Colorado

September, 2002

ARTHUR I. MEARS, P.E., INC.

Natural Hazards Consultants

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Gunnison, Colorado 81230
Tel/Fax: 970-641-3236
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September 23, 2002

Mr. Glenn Pauls
Box 426
Placerville, CO 81430

Dear Mr. Pauls:

The attached mapping and evaluation of avalanche hazard within and near your property has been prepared as specified in my proposal dated March 13, 2002.

The report consists of two parts: (a) the text portion, and (b) the avalanche map, which is separate from the text.

Please contact me if you have any questions.

Sincerely,



Arthur I. Mears, P.E.
Avalanche-control engineer

Encl.

1 OBJECTIVES AND LIMITATIONS

This report, as requested by Mr. Glenn Pauls and Peter Jamar, and as specified in my proposal of March 13, 2002 has the following **objectives**:

- a. Mapping of design-magnitude¹ avalanche in areas within and immediately adjacent to the Pauls property near Ophir;
- b. Computation of the dynamics and destructive potential of these avalanches; and
- c. Evaluation of the suitability of utilizing the properties as residential building sites.

The report also has the following **limitations**, which must be understood by all those relying on the results:

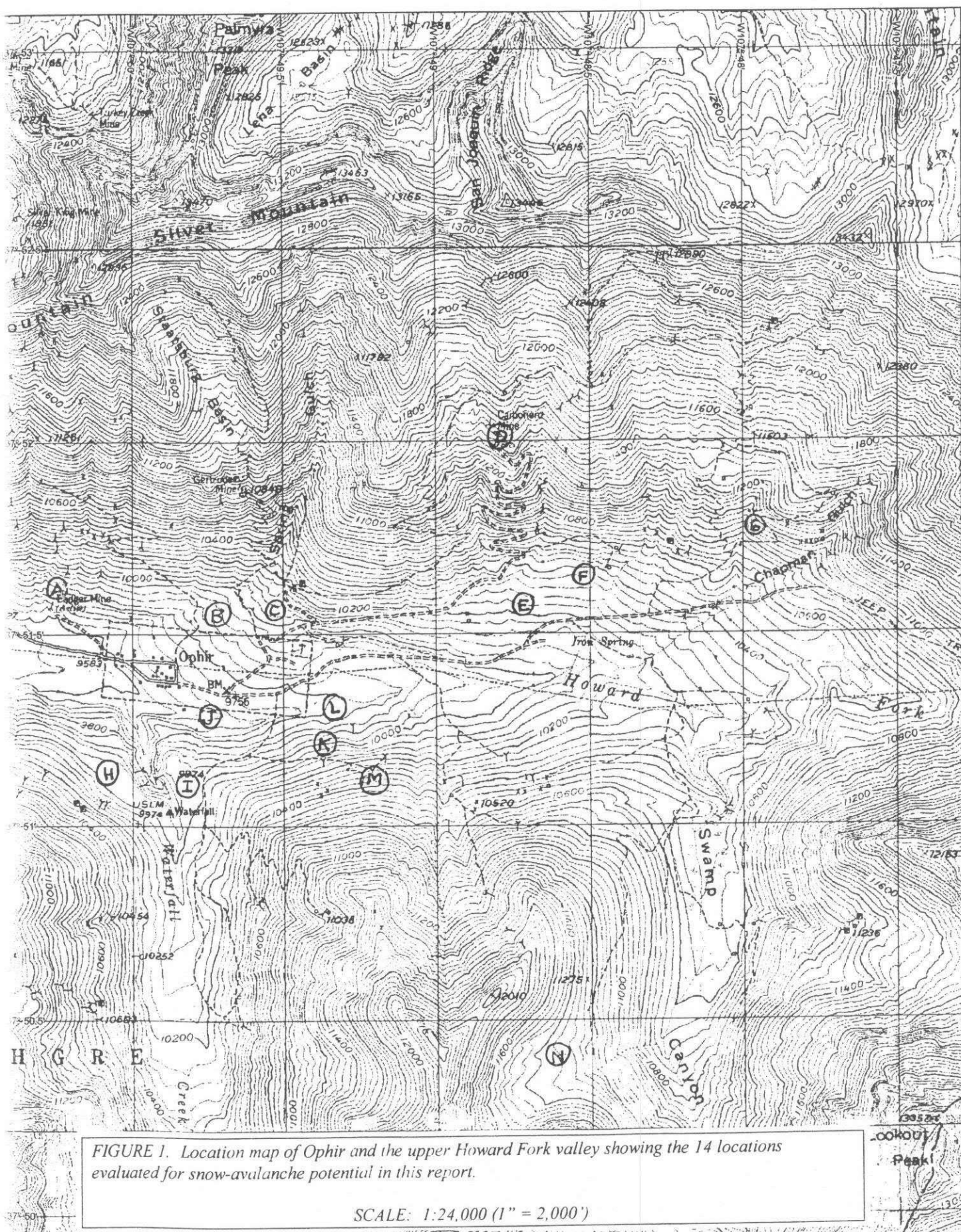
- a. This report evaluates avalanche potential during current forest cover conditions; widespread timber clearing by natural (e.g., forest fire) or man-caused conditions could increase avalanche potential;
- b. Even larger avalanches (e.g. 300 or 1000-year return period events) could occur and exceed the sizes mapped;
- c. Numerous avalanches occur in the Ophir valley outside the limits studied; these have not been mapped; and
- d. This report is not complete without the detailed topographic maps (Figures 3, 4 and 5).

2 TERRAIN, HISTORY AND DESIGN-MAGNITUDE AVALANCHES

2.1 Terrain and history

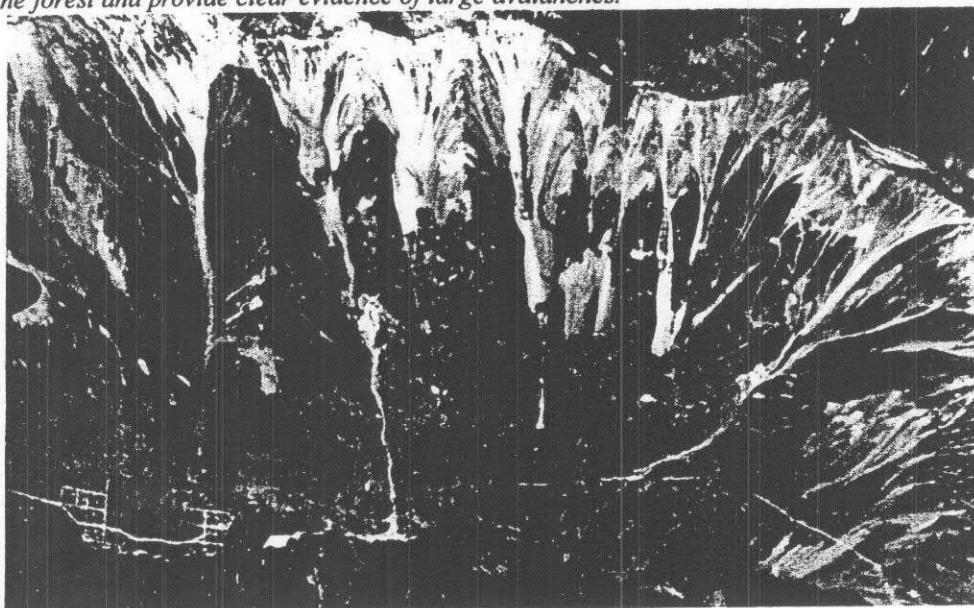
The terrain within the study area is shown on Figure 1, a 1:24,000-scale (1" = 2,000') topographic map based on U. S. Geological Survey data and aerial photography taken in 1951. The 14 properties considered in this analysis are labeled "A" through "N," ("E" and "F" are west and east sides of the Iron Springs Placer) and were specified by Mr. Glenn Pauls on a topographic map sent to me in March, 2002. This figure is simply a location map intended to relate property locations to the general topographic setting of the valley. The property boundaries and limits of design avalanches are shown in greater detail on the large-scale topographic maps (Figures 3, 4 and 5) accompanying this report.

¹ Design-magnitude avalanche – In San Miguel County, this avalanche is the largest and most destructive event expected in approximately 100 years and must be considered in land-use planning and engineering. The true return period of such an event is difficult to determine precisely, therefore may lie between 30 and 300 years. Some jurisdictions in Colorado (e.g. Gunnison and Pitkin Counties) and elsewhere (Switzerland, Norway, Iceland) require that the 300-year or 1000-year event be considered.



The Ophir valley is a classic, glacially-eroded “U-shaped” valley, encompassing roughly 4,000 vertical feet, from approximately 9,500 feet west of Ophir to 13,500 feet at the higher peaks. The higher terrain (generally above 11,500 feet) averages greater than 30° inclination and in many locations is devoid of tree cover. The valley receives relatively heavy snowfall and strong winds during many snow seasons, a period that can last from November through May. The combination of steep terrain, numerous open slopes devoid of trees that would anchor the snowpack, and occasional heavy, windy snowstorms can and has produced large snow avalanches. Figure 2 is a U. S. Forest Service aerial photograph of the valley showing many distinct linear scars through the forest which were created by snow avalanches. Typically, these scars extend downslope from the starting zones² through the forest. This impact damage is clear evidence that avalanches have occurred repeatedly. Forest destruction and application of avalanche-dynamics equations has been used in this study to estimate runout potential.

FIGURE 2. U.S. Forest Service aerial photo (dated 10-5-97) of Ophir and the upper Howard Fork valley. Numerous avalanche paths appear as distinct downslope-oriented scars through the forest and provide clear evidence of large avalanches.



Historic evidence also exists for large avalanches within and near Ophir. For example, a large dry-snow avalanche beginning in Spring Gulch (perhaps Staatsburg Basin) completely crossed the alluvial fan upon which the Town of Ophir is located and impacted trees on the south side of the Howard Fork as recently as the 1950's. Trees within the impact area are missing limbs 20-30 feet above ground level. The impact area has been re-colonized by smaller, younger trees but is clearly visible today. Wet-snow avalanches from Spring Gulch have reached and moved houses in Ophir at various times since Ophir

² Starting zone – Terrain inclined at more than 30° (sometimes as little as 25°) where avalanches begin, increase in mass and accelerate. Large starting zones (with more than 30 acres) are common in the Ophir valley and can produce large avalanches.

was founded in the late 19th century and the road between Ophir Loop and Ophir is blocked by large avalanches from both north and south sides of the valley every few years. Extensive avalanching on this part of the road occurred as recently as December, 1983. That year many dry-snow avalanches moved large volumes of loose rock to the road. While the historic avalanches have not affected much of the Pauls property (see section 4), the physical and historic evidence of avalanches in combination with the terrain and climate provides convincing evidence of avalanche potential throughout the valley.

2.2 Determination of the design-avalanche limits

Although inspection of terrain and forest cover provides, in many cases, evidence of design avalanche extent and frequency it does not indicate avalanche destructive energy, or impact-pressure potential³. Furthermore, avalanches apparently have not been as large as possible in certain paths even though large starting zones exist within these paths. For these reasons, the design-avalanche characteristics must be computed. Computational methods are described in some detail in Colorado Geological Survey Bulletin #49⁴. In this study the following 2-step procedure was used:

1. Step 1 – The *stopping position* of the design avalanche was determined in the field and on maps through inspection of damage and destruction to the forest, by geomorphic evidence of avalanche extent, and were computed through use of regression analysis based on a Colorado database of large avalanches.
2. Step 2 – After the stopping position was determined, a 3-component, stochastic, *avalanche-dynamics model* was used to match that stopping position and predict avalanche speeds and impact-pressure potentials.

Examples of the computational techniques are provided in the technical appendix.

3 RED AND BLUE HAZARD ZONES AND LAND USES

In accordance with customary practice used in San Miguel County, elsewhere in Colorado and in selected jurisdictions within the United States⁵ avalanche-hazard zones for land-use or engineering purposes are defined as follows:

1. Red Zone (high hazard) – Avalanches here have (a) return periods of 30 years or less (constant annual probabilities of 1/30 or about 3%), or (b) produce

³ Both impact pressure potential *and* frequency are needed to determine hazard zones (the “red” and “blue” zones), as discussed in Section 3.

⁴ Mears, A. I., 1992, Snow Avalanche Hazard Analysis for Land-Use Planning and Engineering, Colorado Geological Survey Bulletin #49, 82 p.

⁵ Hazard-zone definitions and permitted land uses within hazard zones differ from one location to another within the United States because they reflect local (county or municipal) ordinances. National standards do not exist.

impact pressures of 600 lbs/ft² or more, or both “a” and “b.” Residential construction in the red zone is usually prohibited because of the engineering difficulties associated with mitigation design for large forces or because of high human exposure within frequent avalanche areas.

2. Blue Zone (moderate hazard) – Avalanche here have (a) return periods of 30 to 100 years (constant annual probabilities of about 3% to 1%) and (b) produce impact pressures of less than 600 lbs/ft². Both conditions “a” and “b” must be satisfied or the area is defined as a red zone. Residential construction may be permitted in a blue zone if engineered mitigation is used to protect property and reduce risk to an acceptable level.

The outer limits of the blue zone defines the design-avalanche limits. A “white zone” exists beyond the design avalanche. This is an area where avalanche hazard is considered to be sufficiently small to be disregarded in zoning and land-use regulation.

B. Spring Gulch Alluvial Fan North of Ophir

Site Exposure Classification: Red Zone (High Hazard)

This property, (which has not been identified by mining claim boundaries), can be overrun by large, deep, slow-moving wet snow avalanches from Spring Gulch and avalanches from the slope north of Ophir. Although speeds will be low (thus enabling the sharp deflection of wet-snow debris to the west on the fan), debris depths can be 10-20 feet. Large pressures from the weight of avalanche debris, as well as horizontal impact pressures will be possible. Return period of avalanches across most of this site appear to be greater than 30 years, however the potentially large pressures classify the site as a Red Zone. Mitigation, in the form of a large earthen deflecting berm could be constructed to protect this site from Spring Gulch, however such a berm *cannot be used* because it will increase the avalanche risk at the old Ophir town site.

TECHNICAL APPENDIX

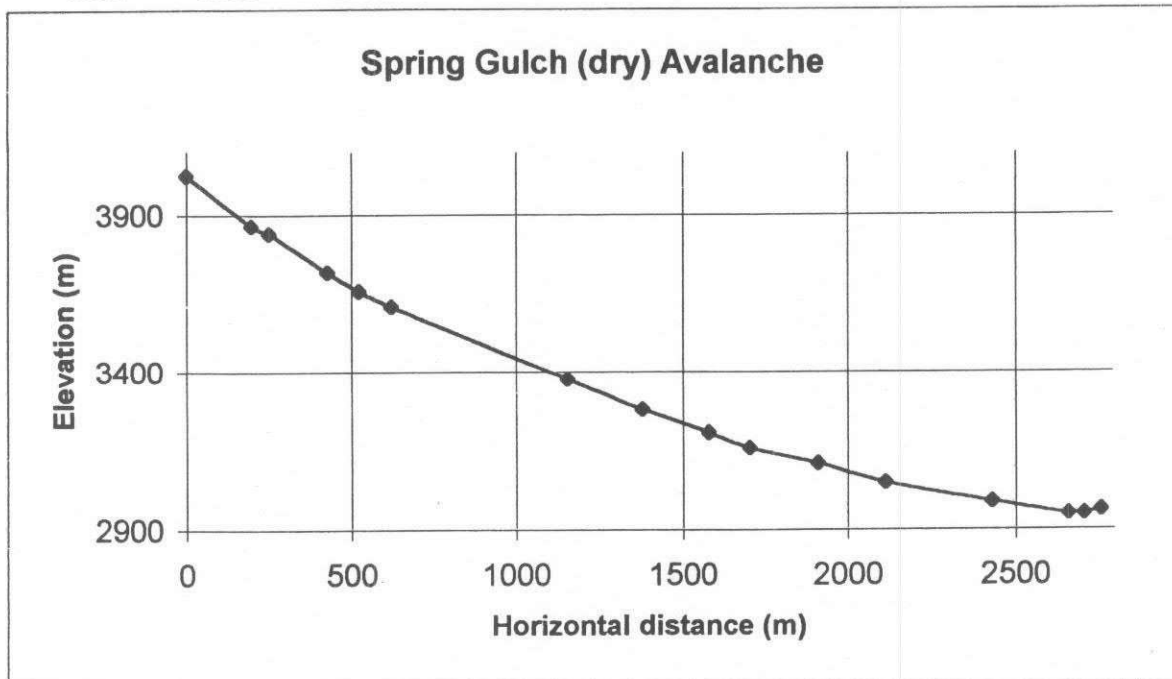
This technical appendix consists of two sections per site. Each site is identified by name and consists of (a) a detailed avalanche path profile broken down into several profile segments and the topographic parameters (length, vertical angle, horizontal and vertical distances) within each segment and (b) a summary of the avalanche-dynamics (speeds of the front and overall average speeds) computed as discussed in the text of the report. These were used to evaluate impact-pressure potentials for Red and Blue hazard-zone definitions.

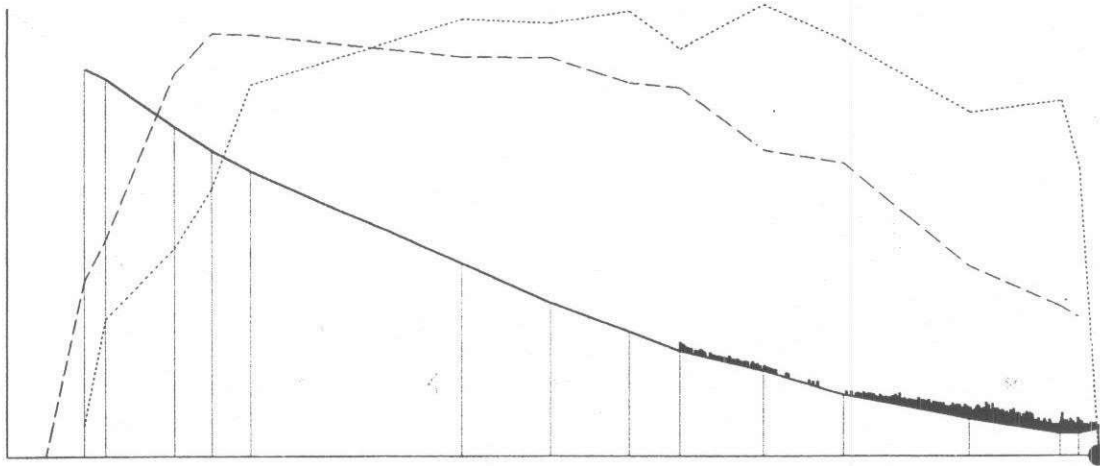
Sheet1

Avalanche Profile and x/y coordinates

Spring Gulch (dry)

Raw Data in feet		Data in meters		Segment Data			Avg Angle
X-feet	Y-feet	X-meters	Y-meters	L-meters	Ang - Deg	Sum L	
0	13200	0	4024			0	
650	12680	198	3866	254	38.7	254	38.7
830	12600	253	3841	60	24.0	314	35.9
1410	12200	430	3720	215	34.6	529	35.3
1720	12000	524	3659	112	32.8	641	34.9
2040	11840	622	3610	109	26.6	750	33.7
3790	11080	1155	3378	582	23.5	1332	29.2
4530	10760	1381	3280	246	23.4	1578	28.3
5180	10520	1579	3207	211	20.3	1789	27.4
5590	10360	1704	3159	134	21.3	1923	26.9
6270	10200	1912	3110	213	13.2	2136	25.6
6930	10000	2113	3049	210	16.9	2346	24.8
7970	9800	2430	2988	323	10.9	2669	23.1
8720	9680	2659	2951	232	9.1	2901	22.0
8880	9680	2707	2951	49	0.0	2950	21.6
9050	9720	2759	2963	53	-13.2	3003	21.0





c:\plk\Spring Gulch Dry.txt

Path drops: 1072 m

Friction $\mu = 0.25$

$\log M/D = 3.10$

Random R = 0.300

Alpha = 21.0 degrees

● Front stops at X = 2757 m

..... Front speed (max = 44.7 m/s)

----- Mean speed (max = 41.8 m/s)

_____ Deposition (not to scale)

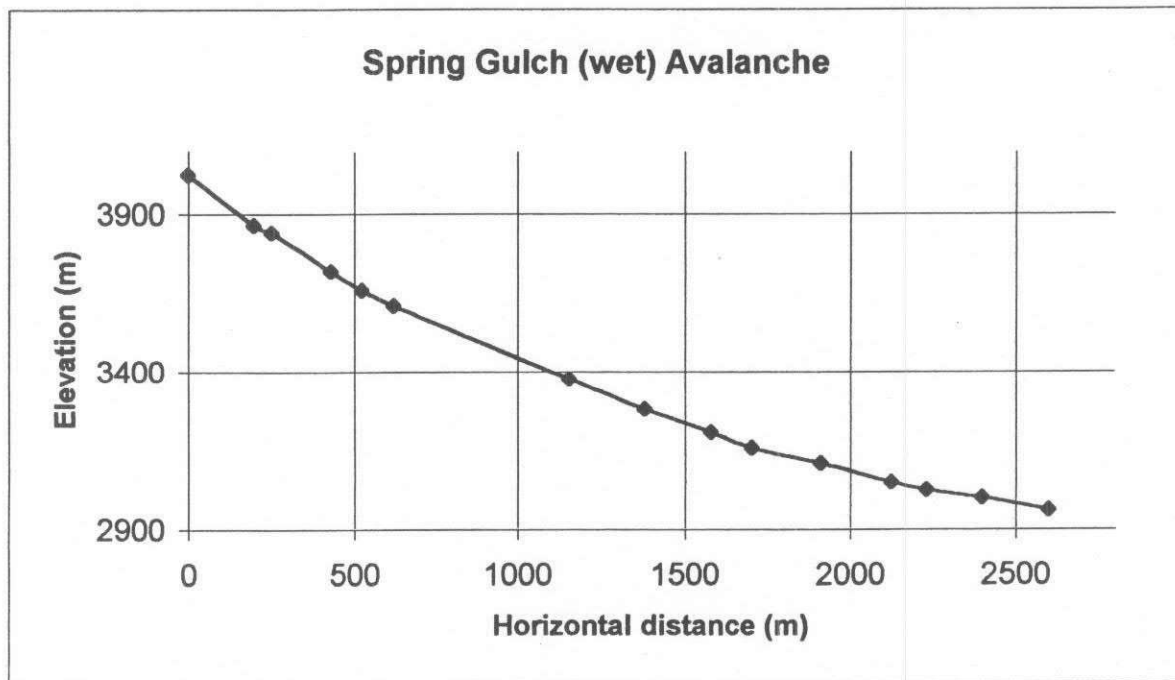
Exit and view distributions
in your file c:\plk\results.txt

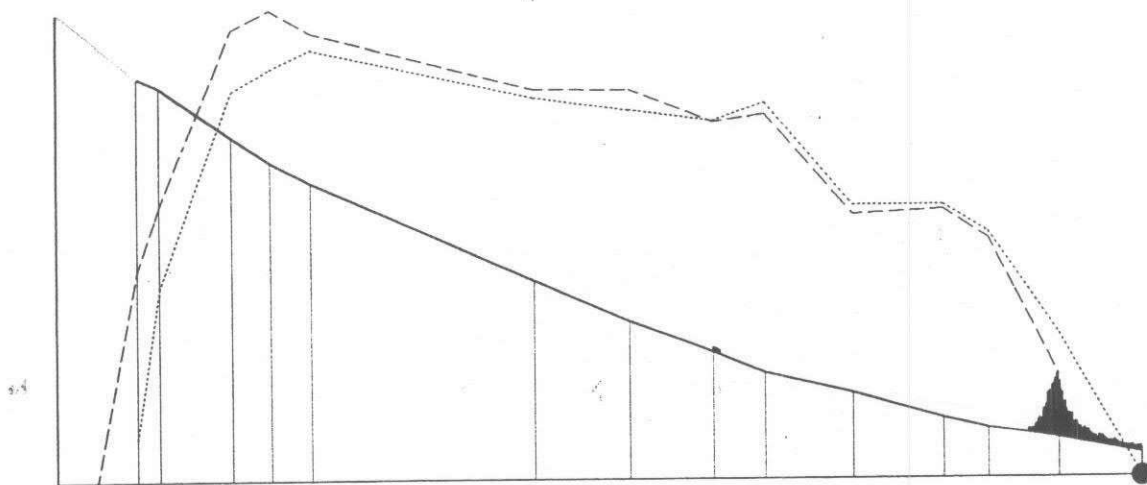
Sheet1

Avalanche Profile and x/y coordinates

Spring Gulch (wet)

Raw Data in feet		Data in meters		Segment Data			Avg Angle
X-feet	Y-feet	X-meters	Y-meters	L-meters	Ang - Deg	Sum L	
0	13200	0	4024			0	
650	12680	198	3866	254	38.7	254	38.7
830	12600	253	3841	60	24.0	314	35.9
1410	12200	430	3720	215	34.6	529	35.3
1720	12000	524	3659	112	32.8	641	34.9
2040	11840	622	3610	109	26.6	750	33.7
3790	11080	1155	3378	582	23.5	1332	29.2
4530	10760	1381	3280	246	23.4	1578	28.3
5180	10520	1579	3207	211	20.3	1789	27.4
5590	10360	1704	3159	134	21.3	1923	26.9
6270	10200	1912	3110	213	13.2	2136	25.6
6970	10000	2125	3049	222	15.9	2358	24.7
7320	9920	2232	3024	109	12.9	2467	24.1
7870	9840	2399	3000	169	8.3	2637	23.1
8520	9720	2598	2963	202	10.5	2838	22.2





c:\plk\Spring Gulch wet.txt

Path drops: 1060 m

Friction $\mu = 0.18$

$\log M/D = 2.60$

Random R = 0.100

Alpha = 22.2 degrees

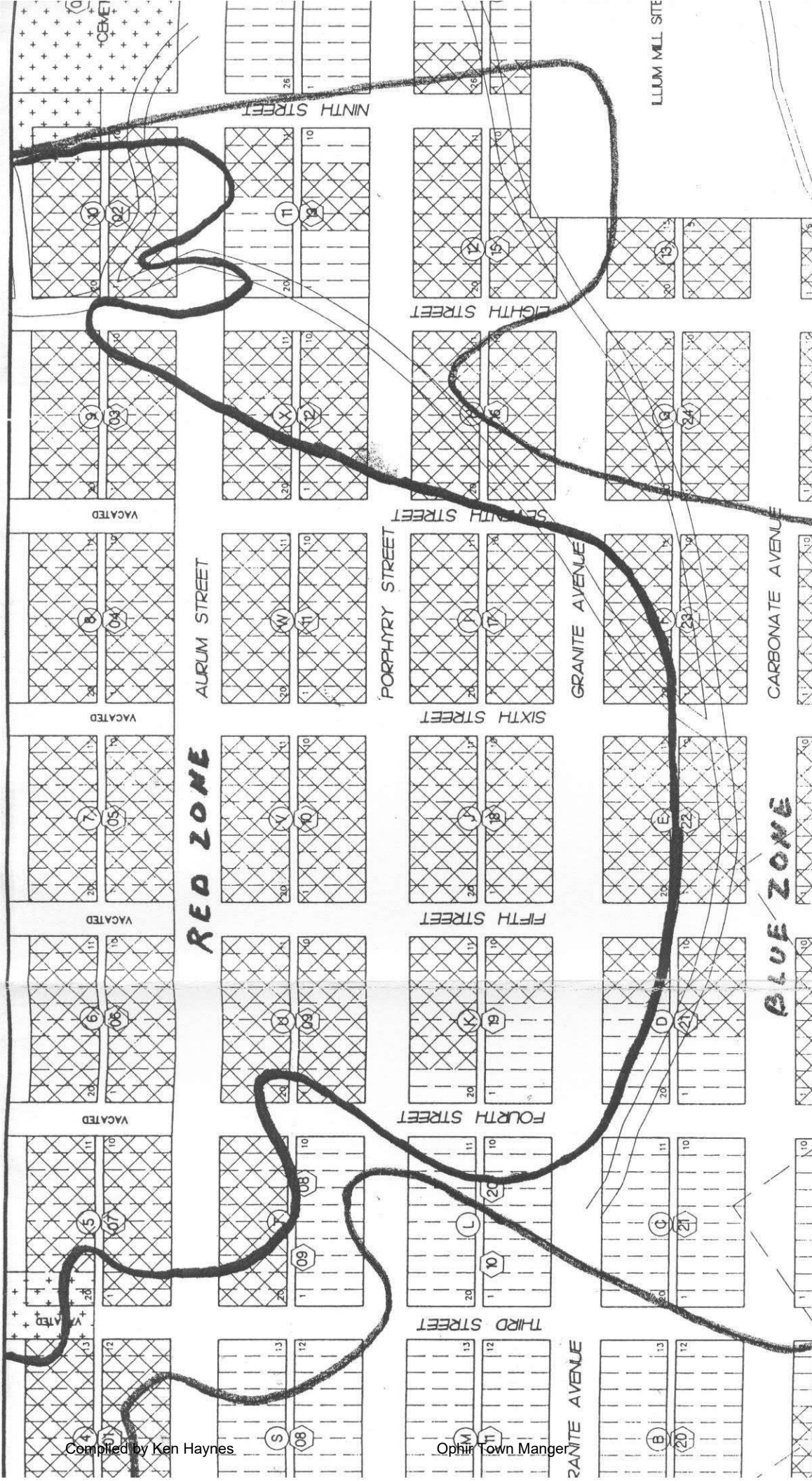
● Front stops at X = 2597 m

..... Front speed (max = 31.9 m/s)

----- Mean speed (max = 34.9 m/s)

_____ Deposition (not to scale)

Exit and view distributions
in your file c:\plk\results.txt



Compiled by Ken Haynes

Ophir Town Manager

air and the Spring
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Ophir area, San
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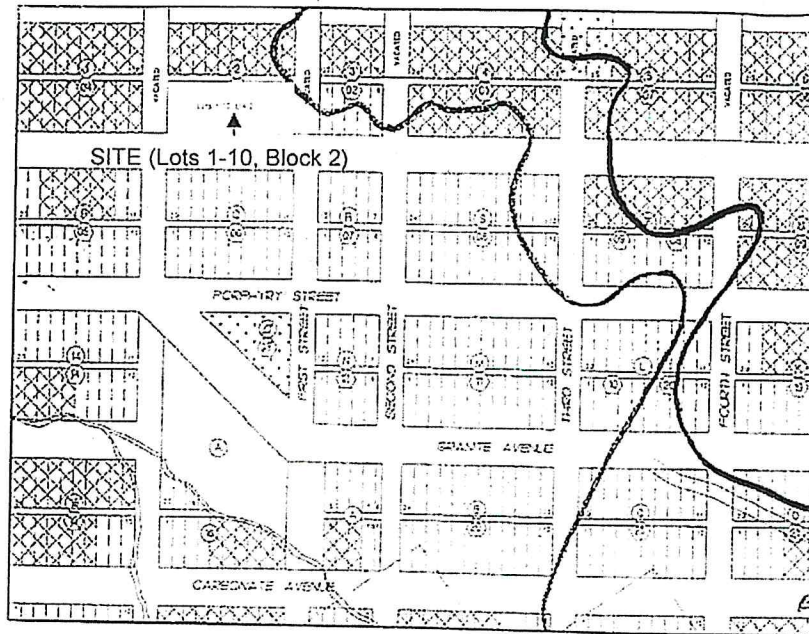


FIGURE 3. Detailed topographic map of Ophir and the Spring Gulch alluvial fan showing avalanche red (high hazard) and blue (moderate-hazard) zones as discussed in the report "Avalanche mapping and hazard analysis. Pauls property, Ophir area, San Miguel County, Colorado." Only design avalanches in the vicinity of the Pauls properties have been mapped.

SCALE: 1:2,400 (1" = 200')

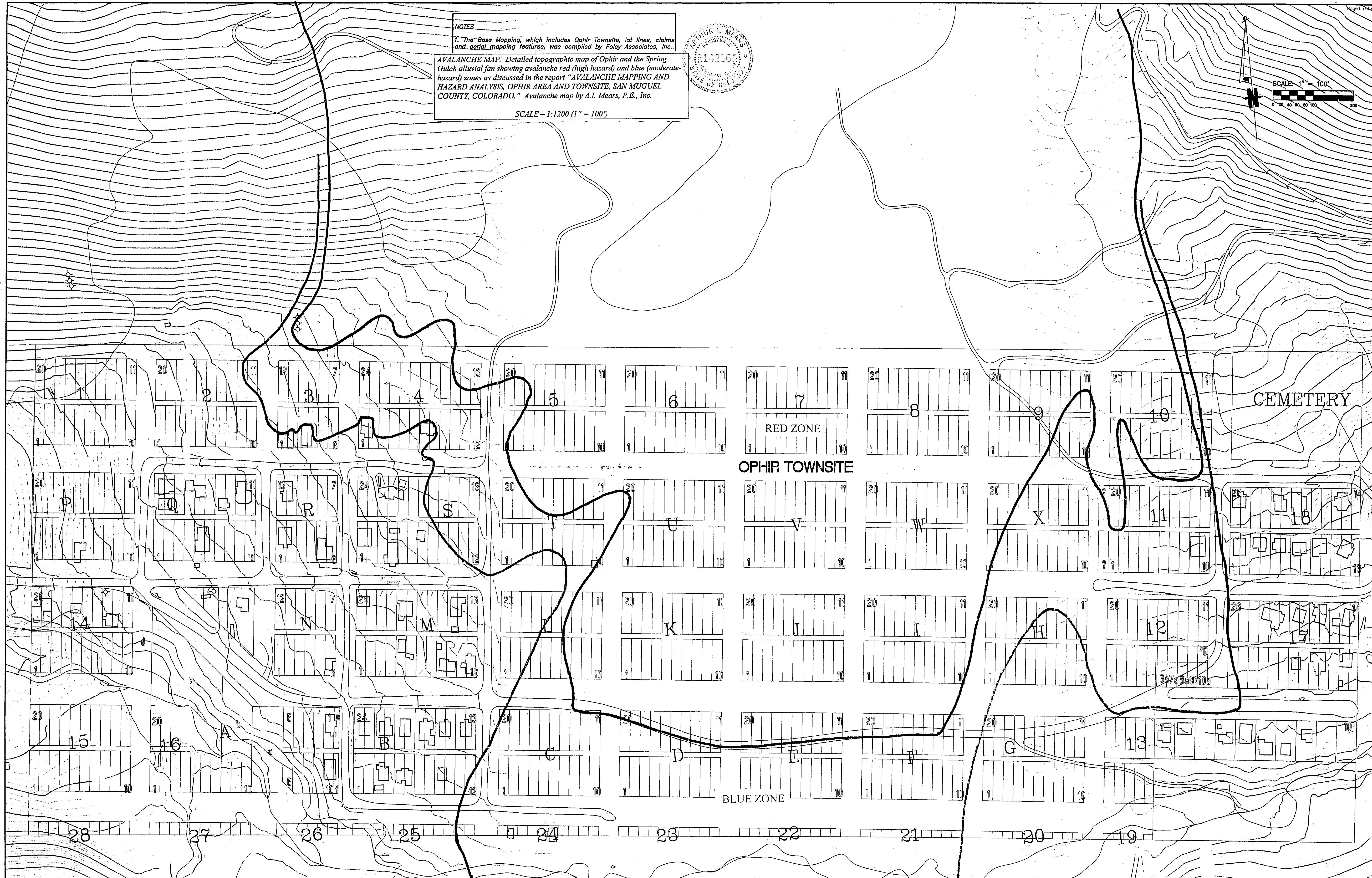
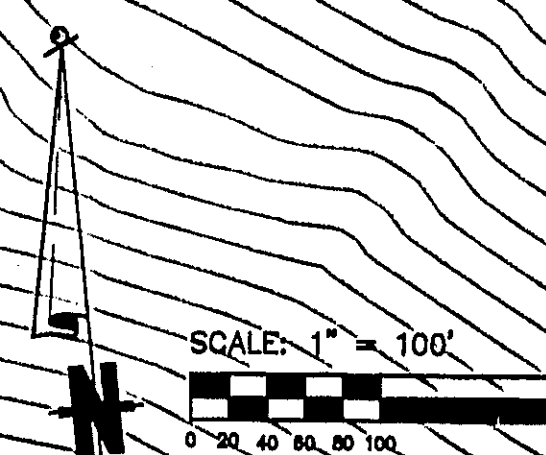
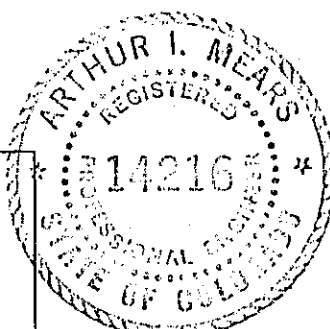
Figure 3 –Hazard Map Recommended by 2002 Mears Study (Ref. 3)

NOTES

1. The Base Mapping, which includes Ophir Township, lot lines, claims and aerial mapping features, was compiled by Foley Associates, Inc.

AVALANCHE MAP. Detailed topographic map of Ophir and the Spring Gulch alluvial fan showing avalanche red (high hazard) and blue (moderate hazard) zones as discussed in the report "AVALANCHE MAPPING AND HAZARD ANALYSIS, OPHIR AREA AND TOWNSHIP, SAN MUGUEL COUNTY, COLORADO." Avalanche map by A.I. Mears, P.E., Inc.

SCALE - 1:1200 (1" = 100')



AVALANCHE MAPPING FOR OPHIR, COLORADO 2004

MAPPING PROVIDED BY THE PAULS FAMILY

Project Mgr:	DF	Rev.	Description	Date	By
Technician:	JH				
Checked by:					
Start date:	3-16-04				

FOLEY
ASSOCIATES, INC.
ENGINEERING • PLANNING • SURVEYING

970-728-6153 970-728-6050 fax
P.O. BOX 1385
125 W. PACIFIC, SUITE B-1
TELLURIDE, COLORADO 81435

Drawing path: \dwg\OphirTown-hazards

Sheet 1 of 1 Project #: 01158



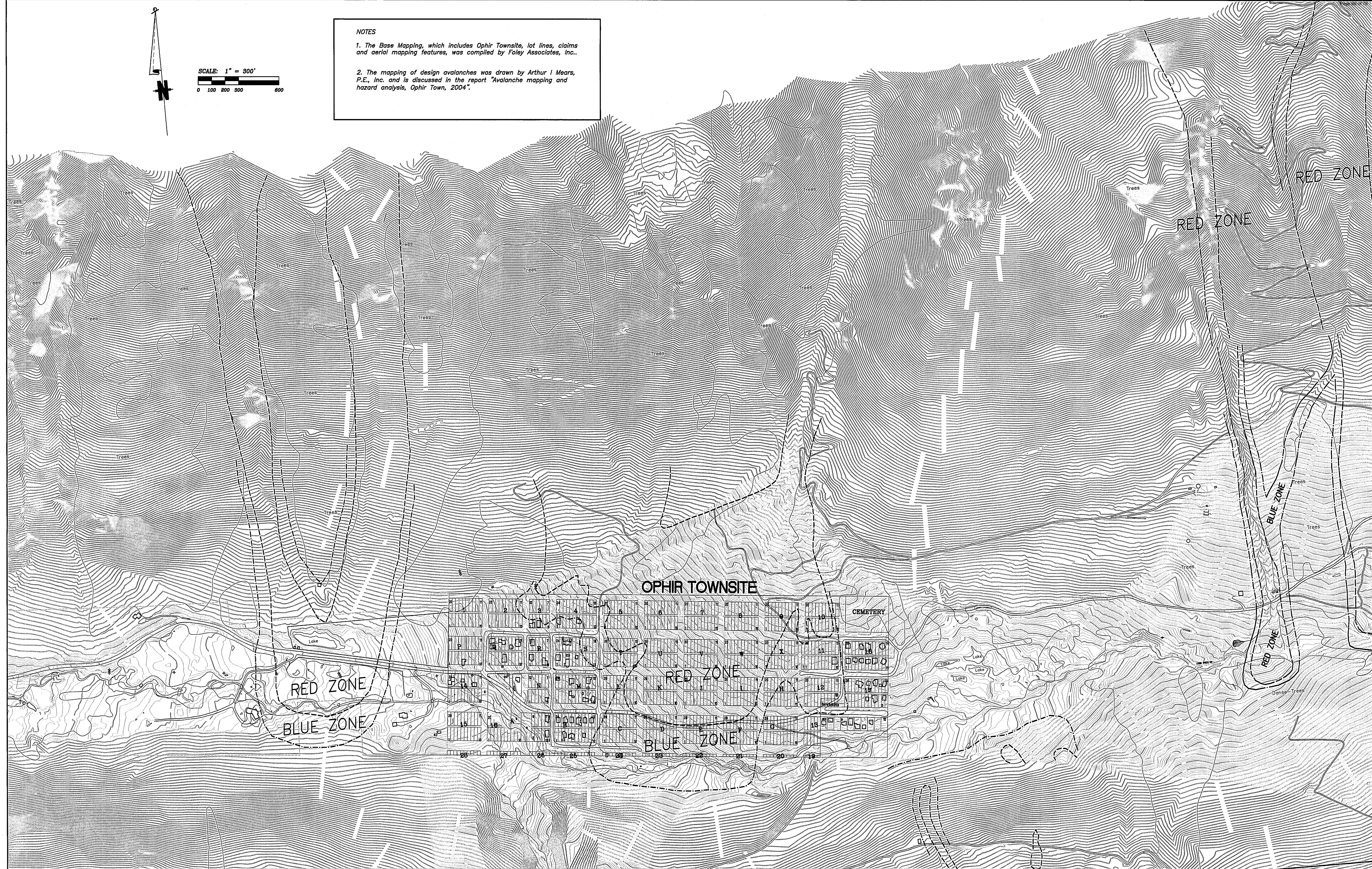
SCALE: 1" = 300'

0 100 200 300 400

NOTES

1. The Base Mapping, which includes Ophir Townsite, lot lines, claims and aerial mapping features, was compiled by Foley Associates, Inc..

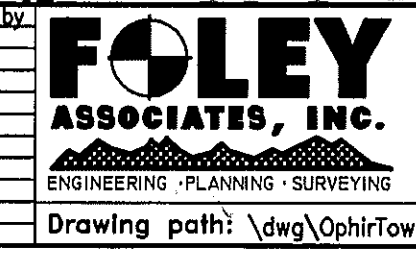
2. The mapping of design avalanches was drawn by Arthur I Mears, P.E., Inc. and is discussed in the report "Avalanche mapping and hazard analysis, Ophir Town, 2004".



AVALANCHE MAPPING FOR OPHIR, COLORADO 2004

MAPPING PROVIDED BY THE PAULS FAMILY

Project Mgr: DF	Rev.	Description	Date	By
Technician: JH				
Checked by:				
Start date: 3-16-04				



970-728-6153 970-728-6050 fax
P.O. BOX 1385
125 W. PACIFIC, SUITE B-1
TELLURIDE, COLORADO 81435

Sheet1 of 1 Project #: 01158

Z:\008200\01158\dwg\OphirTown-hazards.dwg, 10/11/2004 01:53:07 PM, JHE

**AVALANCHE STUDY
AND
AVALANCHE HAZARD ANALYSIS**

for

**CORNWALL PROPERTY
LOTS 1 THROUGH 10, BLOCK 2
AURUM STREET
OPHIR, COLORADO**

November 15, 2007

Prepared for:

David T. Cornwall
1050 N. Portland Ave.
Gilbert, Arizona

Prepared by:

Wilbur Engineering, Inc.
150 East 9th St. Suite 201
Durango, Colorado 81301
(970) 247-1488

November 15, 2007

David T. Cornwall
1050 N. Portland Ave.
Gilbert, Arizona 85234

RE: Avalanche Study
 Lots 1-10, Block 2, Ophir, Colorado

Dear Mr. Cornwall:

Please find attached our report on avalanche hazards at your property. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,
Wilbur Engineering, Inc.

A handwritten signature in black ink, appearing to read "CR Wilbur". The signature is fluid and cursive, with the first part being "CR" and the second part being "Wilbur".

Chris Wilbur, P.E.

Introduction

This report presents the results of a study to evaluate the degree of avalanche hazard at vacant property described as Lots 1-10, Block 2 in Ophir, Colorado (Figure 1). The site lies within the town's designated "High Hazard" avalanche area. The site is located within the historic runout zone of wet avalanches originating from either the Spring Gulch basin or the Staatsburg basin. The site could also be impacted by avalanches originating on the slopes directly north of the site. This report presents a summary of avalanche history, previous studies, and site specific analyses of reference avalanche impact pressures.

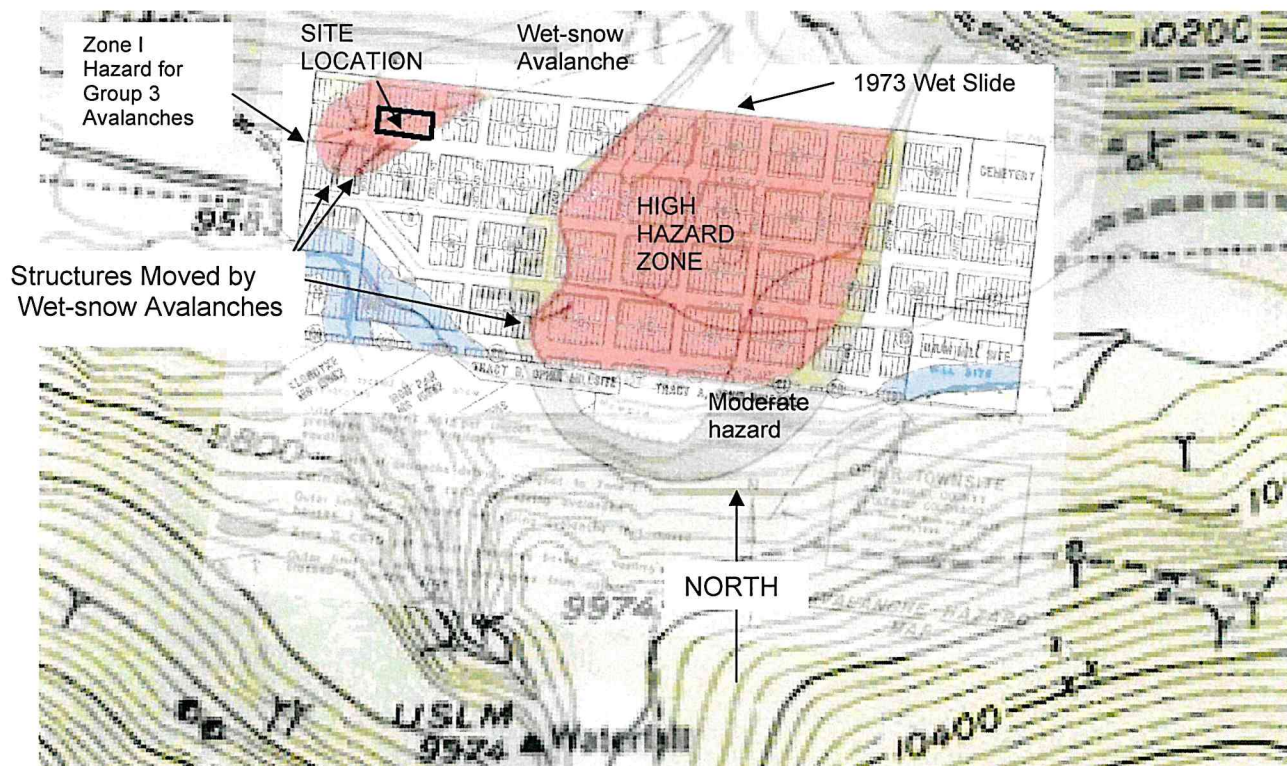


Figure 1 –Site Location with Town Adopted Hazard Map and Historic Slides

Previous Studies

The Colorado Geological Survey (CGS) produced a series of Open File Reports in 1975 that included the first avalanche hazard boundaries for the Ophir area. This information was compiled in CGS Special Publication 7 in 1979 (Ref. 1). The map boundaries were approximate and based on a 1:50,000 scale (Figure 2). The arrows shown in Figure 2 indicate smaller avalanche paths than the shaded areas.

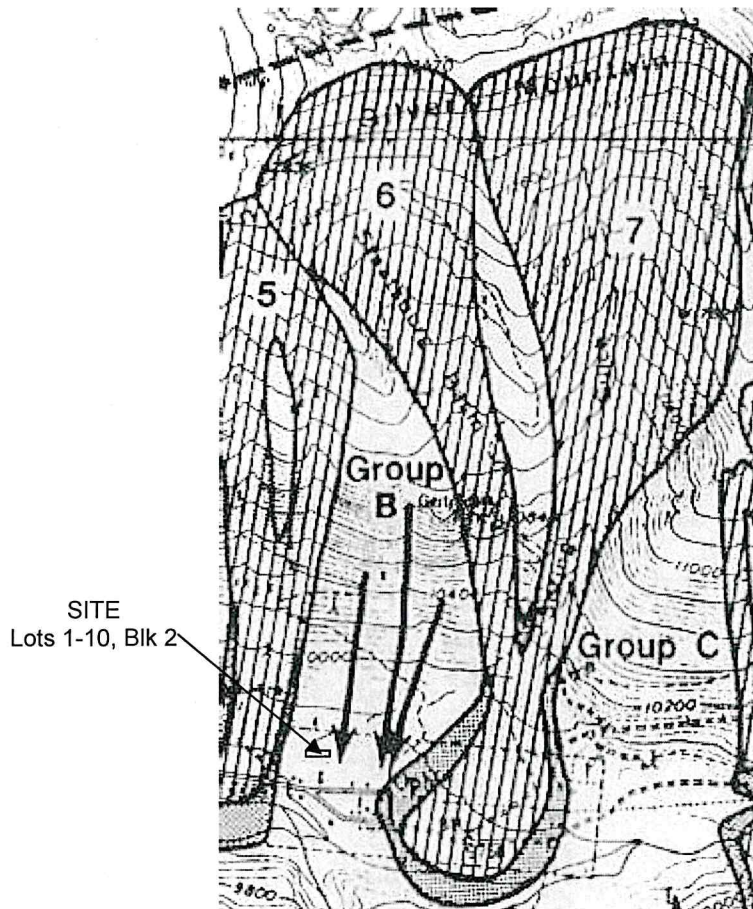


Figure 2 – Colorado Geological Survey Hazard Map

In 1976, a detailed multi-disciplinary study of the Avalanche Hazards at Ophir was completed by the Institute for Arctic and Alpine Research (INSTAAR) (Ref. 2). The town of Ophir's adopted avalanche hazard boundary is based on this study. Figure 1 shows the historic slide paths and hazard map from the 1976 study. It also shows houses that were impacted and moved by wet snow avalanches.

In 2002, Arthur I. Mears, P.E., Inc. completed a study for specific properties in and near Ophir in (Ref. 3). This study was based on more detailed topographic data than previous studies. The Cornwall property was not included in the specific properties evaluated. However, it lies adjacent to property that was included and the results indicated that the site lies outside of the "high/red" and "moderate/blue" avalanche hazard zones. The hazard boundaries recommended in the 2002 study have not been adopted by the town of Ophir. Figure 3 shows the hazard boundaries recommended in the 2002 study.

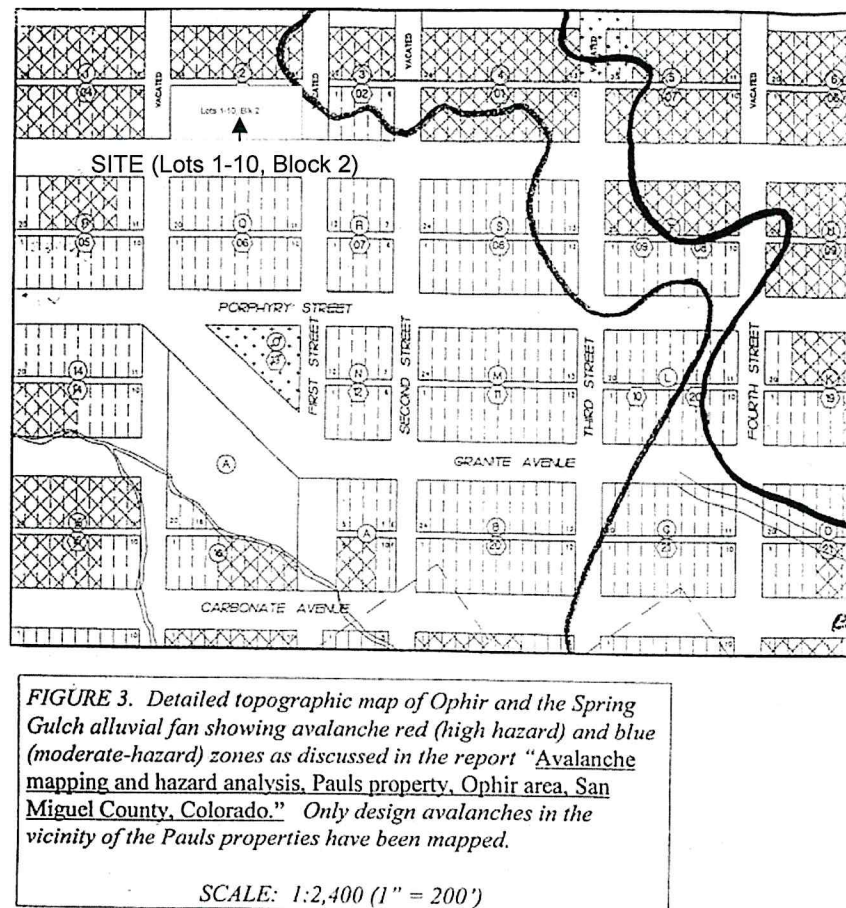


Figure 3 –Hazard Map Recommended by 2002 Mears Study (Ref. 3)

Avalanche History

Records of avalanches affecting Ophir are somewhat limited due in part to periods where population was very small. Census data indicate that Ophir's population in 1940 and 1950 was two (2) and in 1970, it was six (6). It was not reported in 1960.

Tree ring data indicate major avalanches in the Spring Gulch path in the early 1860's, 1885, 1918, 1951, 1958, and 1959 (Ref. 1). The Telluride Historical Museum has two photos showing avalanche debris near two wooden structures in Ophir and a power pole dated May 13, 1918(?) (Ref. 4).

The RGS Story (Ref. 2) states that "buildings between 3rd and 4th Streets were destroyed by fire and avalanches, and today, the town ends at 3rd Street." It also has photos and describes a 1919 avalanche that "swept down Granite Ave. – smashing the

Brown home – and then, crossed Fourth St., knocking the Hotel Elliott off its foundation.”

A dry-snow avalanche in January 1958 crossed the Howard Fork of the San Miguel River. The 1951 avalanche was also a dry-snow avalanche.

Figure 1 shows the path of a wet spring avalanche that ran in April 1973 and split into three lobes within the town boundaries (Ref. 1).

A series of avalanches in December 1983 isolated the town for days and caused a power outage, but there was no report of impacted buildings (Ref. 2). Most recently, an avalanche destroyed one power pole and cut off electricity in March 2004, but stopped well short of the town limits.

Analyses Methods

We applied a combination of methods in this study, including field observations, review of previous studies, historical research, topographic analysis, aerial photo interpretation and avalanche dynamics modeling using the Swiss program Aval-1D, version 1.4. We also took into account climatic factors, elevation, aspect and vegetation conditions.

We made the following assumptions in our analyses:

1. The design avalanche has a return period of approximately 100 years. Due to the relatively short and incomplete historic record, the reference avalanche is an estimate within about one-half order of magnitude.
2. Large dry snow avalanches originating in Spring Gulch or Staatsburg basins will not reach the site due to topographic controls
3. Large wet avalanches originating in Spring Gulch or Staatsburg basins could reach site and stop near the historic limits at about elevation 9620 feet.
4. Medium-sized wet avalanches originating on the slopes north of the site could reach the site.
5. The flow depth, impact pressures and total discharge for wet snow avalanches originating in Spring Gulch or Staatsburg basin are based on an avalanche dynamics model calibrated to match historic runout distances.
6. The flow depth, impact pressures and total discharge for wet snow avalanches originating on the slopes north of the site are based on statistical runout methods and an avalanche dynamics model calibrated to match predicted runout distances.

Conclusions

Official Hazard Map

The Official Hazard Zoning Map of the Town of Ophir is based on the 1976 INSTAAR study (Ref. 1). That study used reference impact pressures of 615 lb./ft² (30 kPa) to define "Zone I" which corresponds to High Avalanche Hazard where no development is recommended. We have identified two inconsistencies between the official map and the INSTAAR Study. The subject property is located in an area affected by these inconsistencies.

1. The adopted map applies the "High Hazard" designation to the limits of a wet snow avalanche originating in Spring Gulch that moved two houses, but lies outside of the INSTAAR "Zone I."
2. The official map does not properly designate as "High Hazard" the "Zone I" area at the northwest corner of the platted town that is affected by wet snow avalanches originating on the steep slopes north of the subject property. This particular hazard corresponds to one of the Group 3 avalanches in Figure 2.

Site Specific Analyses

Table 1 presents the results of our analyses for the design magnitude avalanche. The ranges reflect variations that depend on location. The degree of hazard comes from three potential avalanche paths and varies with location. In general a greater hazard exists from the Spring Gulch and Staatsburg paths towards the east-northeast (up-gradient). The Group 3 path presents a greater hazard towards the northwest. The return period estimates reflect both location and an uncertainty of about one-half order of magnitude.

Table 1 – Design Magnitude Avalanche Parameters

Path Name	Reference pressure (kPa)	Estimated Return Period (yrs)	Avalanche Type
Spring Gulch	15-20	30-100	Wet
Staatsburg	10-15	30-100	Wet
Group 3	1-16	30-300	Wet

Neither the town of Ophir nor San Miguel County's Land Use Codes define technical criteria for distinguishing avalanche hazard zones. Nor do state or federal standards exist. Based on customary local practice, applying criteria from the 2002 Mears

Report¹, we conclude that the subject property is entirely within a “moderate/blue” avalanche hazard classification.

We conclude that development of the site could be mitigated for the design magnitude avalanche using site specific analyses and designs. Such analyses and designs are beyond the scope of this study.

Limitations

Much of the current state of practice in avalanche science and engineering is based on historic events and evidence of past events. Due to the very short period of observations and limited records relative to the design avalanche, considerable uncertainty exists regarding the location of hazard boundaries and corresponding impact pressures. The recommendations in this report are based on the standard of care for avalanche hazard evaluation at this time and locality. No other warranties, expressed or implied, are made.

Sincerely,

Wilbur Engineering, Inc.



Chris Wilbur, P.E.



References

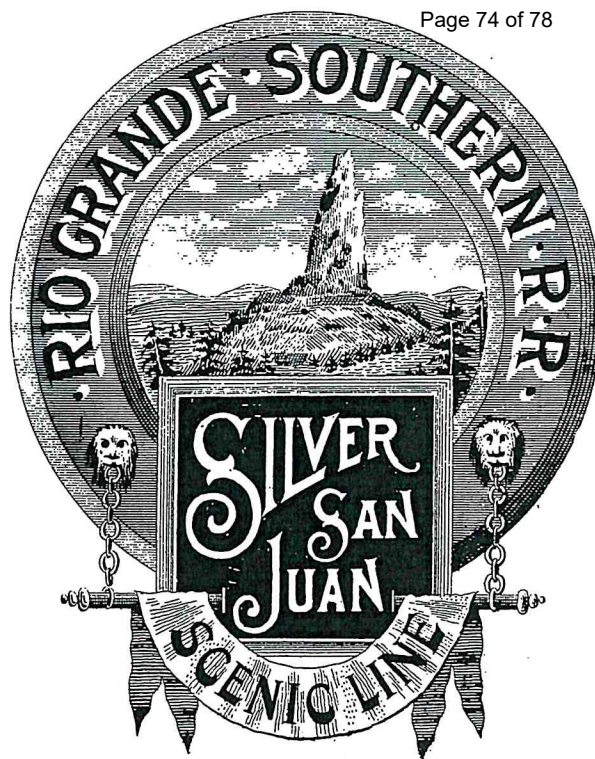
1. Jack D. Ives, Arthur I. Mears, Paul E. Carrara, Michael J. Bovis, *Natural Hazards in Mountain Colorado*, Annals of the Association of American Geographers, Vol. 66, No. 1 (Mar., 1976), pp. 129-144
2. *RGS Story Vol. III, Vance Junction to Ophir*, W. George Cook, Dell A. McCoy, Russ Collman, Sundance Publications, Ltd., 2000.
3. Mears, Arthur I., *Colorado Snow-Avalanche Area Studies and Guidelines for Avalanche-Hazard Planning*, Special Publication 7, Colorado Geological Survey, 1979.
4. Telluride Historical Museum photos 2004-01-298 and 2005-01-3.
5. Arthur I. Mears, P.E., Inc., *Avalanche Mapping and Hazard Analysis Pauls Property, Ophir Area*, September, 2002.

¹ The *Red Zone (high hazard)* is defined as a location where avalanches have return periods of 30 years or less or produce impact pressures of 30kPa or more.

The *Blue Zone (moderate hazard)* has a return period of 30 to 100 years and produces impact pressures less than 30 kPa.

Vera and Randolph Belisle and the Ophir Depot

By William A. Graves



No. **4**

VERA AND RANDY BELISLE were a unique link between the Rio Grande Southern Railroad and the community of Ophir. For many years, their home in the Ophir depot was a popular place for local people to meet and visit.

Randy's father was a hard-rock miner in the Ophir district, so it is not surprising that mining became Randy's vocation. The New Dominion Mine, at the edge of Ophir townsite, was first developed by Randy's father, James M. Belisle. Randy, his brother, Frank, and his father all worked in the New Dominion, and Randy still owns it (as these lines are written). Randy's father also homesteaded a ranch near Norwood, and Randy graduated from Norwood High School in 1931.

Vera Hughes graduated from Olathe High School in 1938 and married Randy in 1940. Vera and Randy lived in Ophir and Alta during their early married years. Randy worked at the Alta Mine during World War II, when the Alta was very busy producing metals for use in the war effort. The mine worked two shifts a day, and the mill worked three shifts. Life in the mining camp of Alta — at 11,000 feet above sea level — could be pretty rugged. Vera later recalled a

very unpleasant trip, riding down from Alta on a horse-pulled bobsled in deep snow, when she was about to have their first baby. (The Belisles have two children, Myrna and Jim.)

The Belisles moved to more comfortable surroundings in 1944. The Rio Grande Southern needed a station agent at Ophir; however, they did not have the money to pay for one. Vera took the job as an "unofficial" agent, without pay, and the little depot became the Belisle's home for 12 years. The waiting room became their living room, and their sleeping quarters were upstairs. Vera handled paperwork for freight and messages for the Galloping Geese motormen, or for the freight-train crews.

A brief stop at the Ophir depot was always a welcome break in the tension when negotiating the dangerous track above and below Ophir. The Galloping Geese in particular did not like snow on the track, and they had a hard time fighting winter storms. When the notorious avalanches on the Ophir Loop blockaded the mainline of the RGS, the Belisles provided a welcome refuge for passengers and crew members.

The station-agent's job and raising a family did not keep Vera busy enough. After she moved

Photo with just people: "Spring Snow Slide At Old Ophir May 13, 1918"

From Telluride Historical Museum database:

Two wooden structures with railing fence. Power pole. Six men and three women standing in large pile of snow from avalanche. Two women and two children sitting in front. Printed in pencil on back: " Spring Snow slide at old Ophir. Slide came out of Spring Gulch May 13 1918"

Photo with building in view:

Several people and dog standing in middle of snow from snow slide. Power lines overhead and power pole to the left. Snow covered mountains in background. Printng in pencil on back: " Spring snow slide at Old Ophir. Slide came out of Spring Gulch. May 13, 1918"



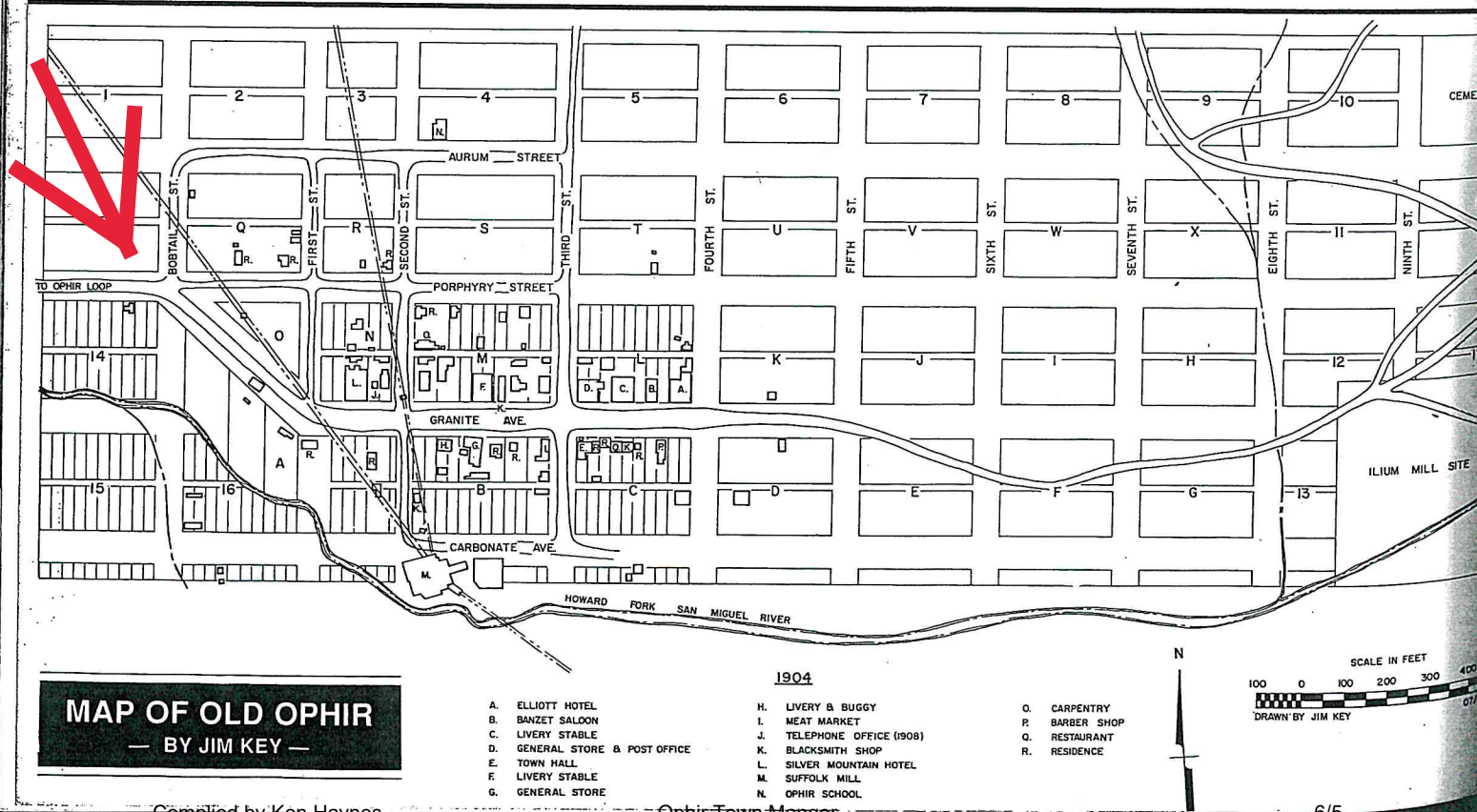




RICHARD A. RONZIO COLLECTION

THIS BEAUTIFUL PICTURE of old Ophir was taken sometime between 1896 and 1910. This period was Ophir's most prosperous time, and the buildings look well cared for. The commercial buildings are identified on the map below. All of these buildings, except the

stamp mill and the school, were on Granite Avenue, the main business street of the town. Most of the other buildings in this photograph were residences. The ravine behind Ophir is Waterfall Gulch. This same photograph appears enlarged on the next three pages.



The applicant is requesting that lots 1-10 block two be removed from the High Avalanche designation on the Town of Ophir Hazards Map.

The property, lots 1-10 block two, has been in the Cornwall family since 1942 when Henry Cornwall, the book keeper for the Silver Bell Mine, purchased it from the County of San Miguel *(1404.2). The Property was at the time, and continues to be zoned as Residential (R) *(1404.4).

In 1976 the Institute of Arctic and Alpine Research, was seeking to develop methodologies, including a combination of remote sensing techniques and interdisciplinary field studies, to assist governmental agencies at the township level, and to alleviate land management in natural hazard areas; including avalanche, landslide, mudflow, rockfall, and mountain flood *(INSTAAR). As a part of this project, INSTAAR published a case study for the town of Ophir based on the Ophir Area Plate 9 open-file report provided by Art Mears to the State of Colorado in 1975 *(Special Publication Plate 9). The Mears open-file report includes 15 hazard mapping area's initially done on 1:24,000-scale (forty foot intervals) U.S. Geological Survey topographic maps. The Plate 9 avalanche hazard zone map is defined by High Hazard Zone I, Moderate Hazard Zone II, Zone Boundary, and Small Avalanches. Small Avalanche areas are designated as Groups A, B, C, and D reflecting Small Avalanche Path's that are not to be included in either high or moderate hazard zones. INSTAAR addresses Group A, B, C and D as minor paths indicated by arrows Fig. 2.

The adopted Town of Ophir Hazards Map applies the High Hazard designation to lots 1-10, block two, yet, on the INSTAAR map produced for the Town, the Property lies outside of the INSTAAR Zone 1. On the INSTAAR map, the Property corresponds with Group B, and or minor paths according the the INSTAAR report Fig.2. *(2002 Mears Report), *(2007 Wilbur Report).

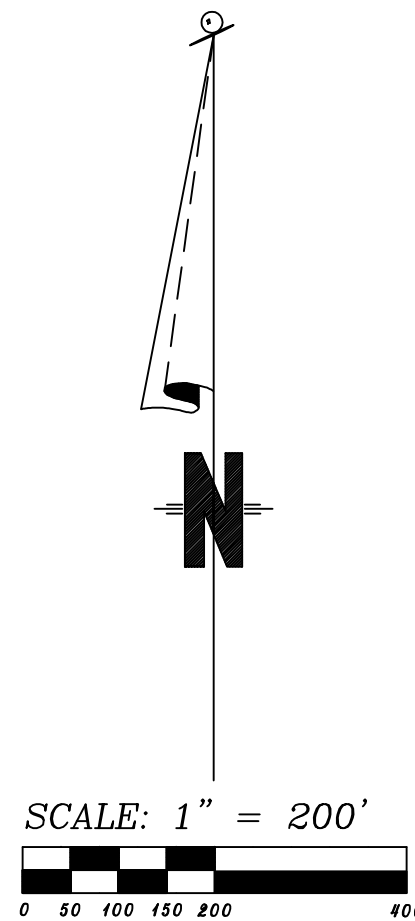
Additionally, INSTAAR Fig 10., references "Houses moved by wet snow avalanches" and identified those as 1 and 2 on the map, yet no such homes exist on the Map of Old Ophir *(Map of Old Ophir). The Telluride Historical Museum database has information and photos relating to a "Spring Snow Slide at Old Ophir May 13 1918". The information and photos supplied reference two structures, however analysis of the supplied photos show that the area in question is by the Telephone Office (J) located on Granite Ave and Second St. *(Spring Snow Slide May 13 1918).

It appears that the inclusion of Lots 1-10, Block 2 in the High Avalanche Hazard zone may have been based on an incorrect interpretation of the INSTAAR report information. The applicant requests that the map be amended to reflect the removal of the Property from the High Avalanche Hazard Zone.



Legend

- Waterways and Wetland Hazard Area
- 100' Buffer Edge
- Moderate Hazard Area
- High Hazard Area
- Edge of Wet Spring Slides



TOWN OF OPHIR HAZARDS MAP

Project Mgr:	DB	Rev.		description	date	by
Technician:	DD					
Technician:						
Checked by:	DB					
Start date:	4/23/03					

FOLEY
ASSOCIATES, INC.
ENGINEERING - PLANNING - SURVEYING

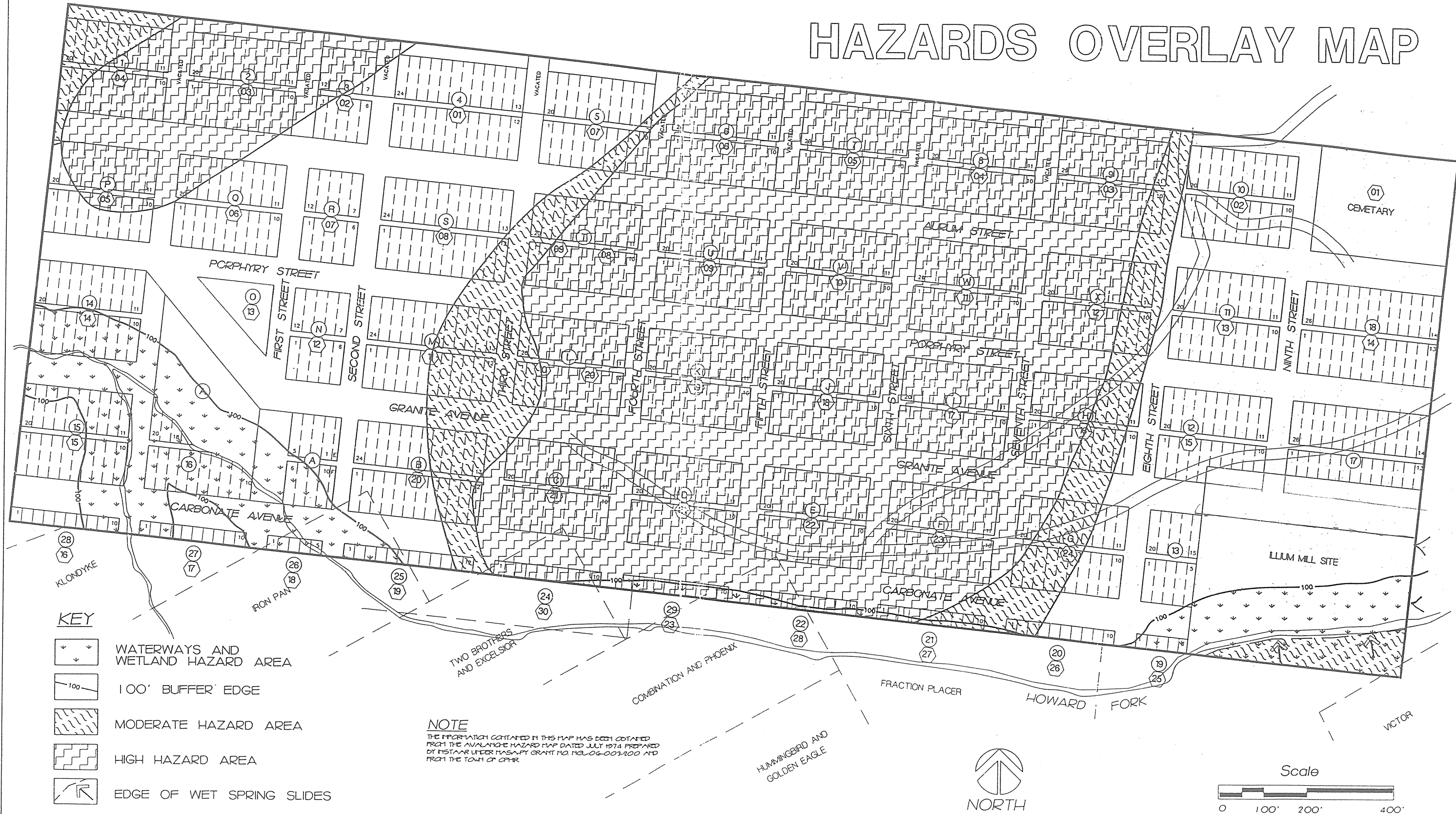
970-728-6153 970-728-6050 fax
P.O. BOX 1385
125 W. PACIFIC, SUITE B-1
TELLURIDE, COLORADO 81435

Drawing path: \OPHIR\DWG\HAZ_MAP_4-03.DWG

Sheet1 of 1 Project #: OPHIR

TOWN OF OPHIR

HAZARDS OVERLAY MAP



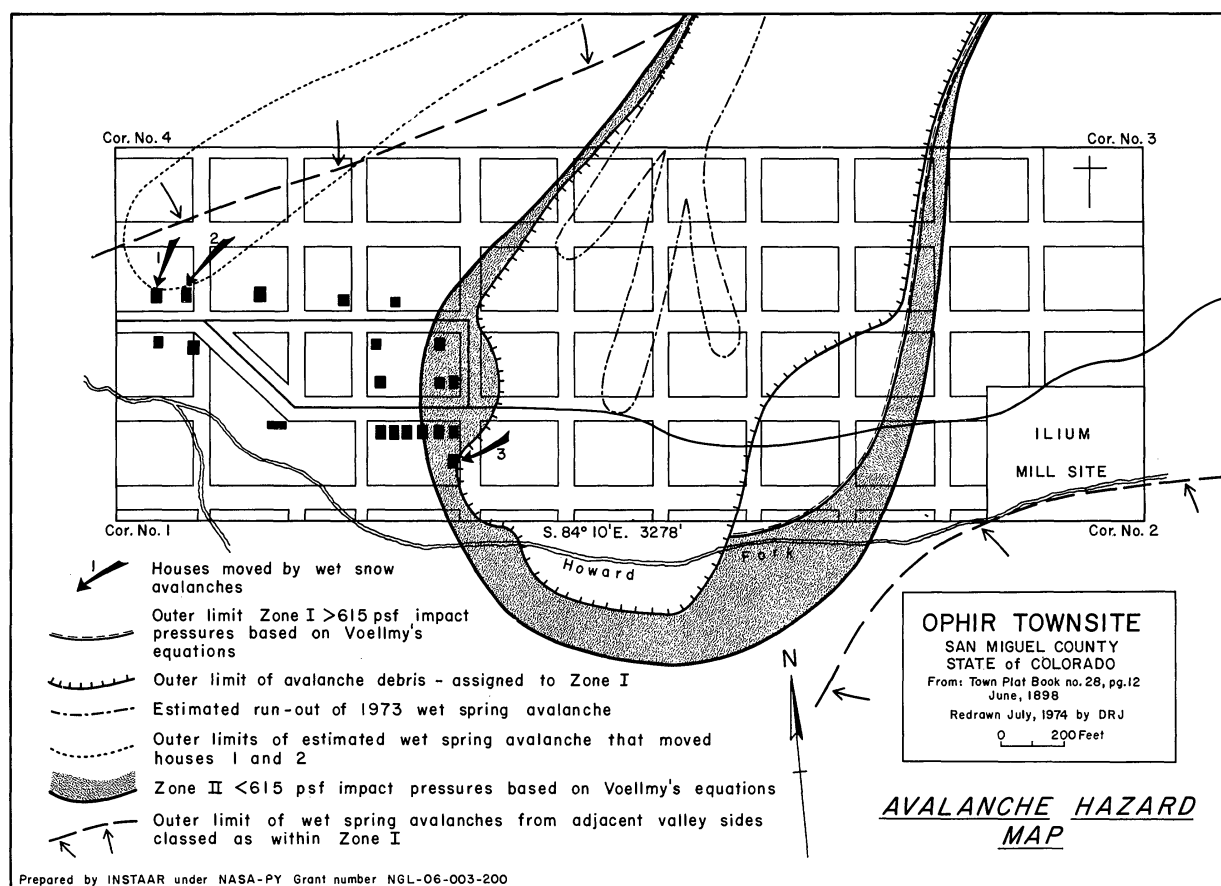


FIG. 10. Detailed avalanche hazard map, Ophir.

uplift force of the aerodynamic loading must also be considered. Wind blast from powder avalanches may also occur close to the indicated run-out limits, and even pressures less than 0.5 t/m^2 are potentially destructive for normal buildings. Windows, for instance, should not face the apex of the Spring Gulch alluvial fan. The other areas of Zone II indicate a recurrence interval greater than twenty years and diminished impact pressures, although the same building restrictions should apply.

Dry and wet snow avalanches originate on the aspen-covered slope just west of Spring Gulch and on the hillside southeast of the town. We recommend that consideration be given to the feasibility of evacuating the threatened section of the town of Ophir at times of extreme danger from large wet snow avalanches from Spring Gulch unless defense measures are undertaken. A successful evacuation policy will depend upon improvement in current forecasting. Although much progress has been made in predicting the timing of wet

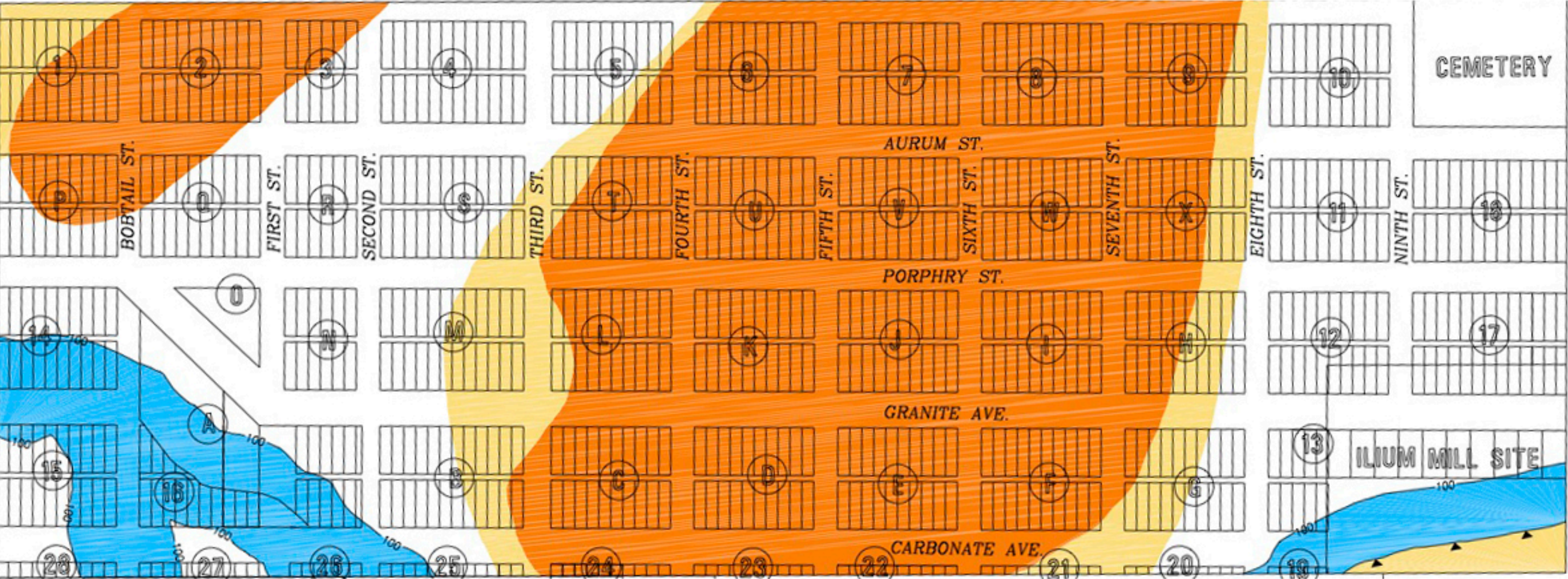
snow avalanches, based upon recent work in the Red Mountain Pass-Silverton area on the far side of Ophir Pass, much more is required before a practical evacuation scheme can be developed.¹⁵ Finally, there is some undeterminable possibility that an even larger avalanche in the future will sweep through most of the existing built-up area. In the absence of historical evidence for an event of this magnitude, we are dealing with an extremely long recurrence interval that cannot be incorporated into any realistic land use policy.

For reduction of existing hazards that threaten Ophir, six standard mitigation approaches should be considered.

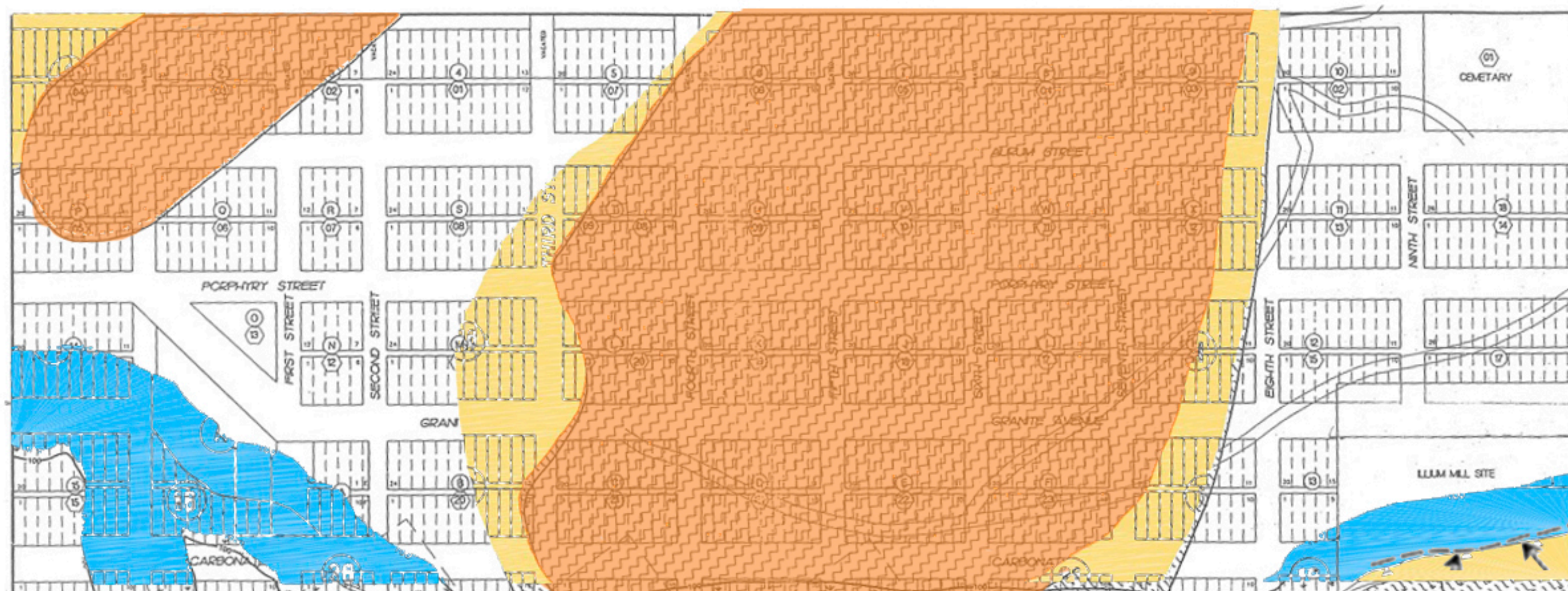
Warning and Evacuation: Local residents might be evacuated before a major avalanche if

¹⁵ R. L. Armstrong, E. R. LaChapelle, M. J. Bovis, and J. D. Ives, *Development of Methodology for Evaluation and Prediction of Avalanche Hazard in the San Juan Mountain Area of Southwestern Colorado*, Occasional Paper 13 (Boulder, Colorado: Institute of Arctic and Alpine Research, University of Colorado, 1974).

2003 - TOWN OF OPHIR HAZARDS MAP

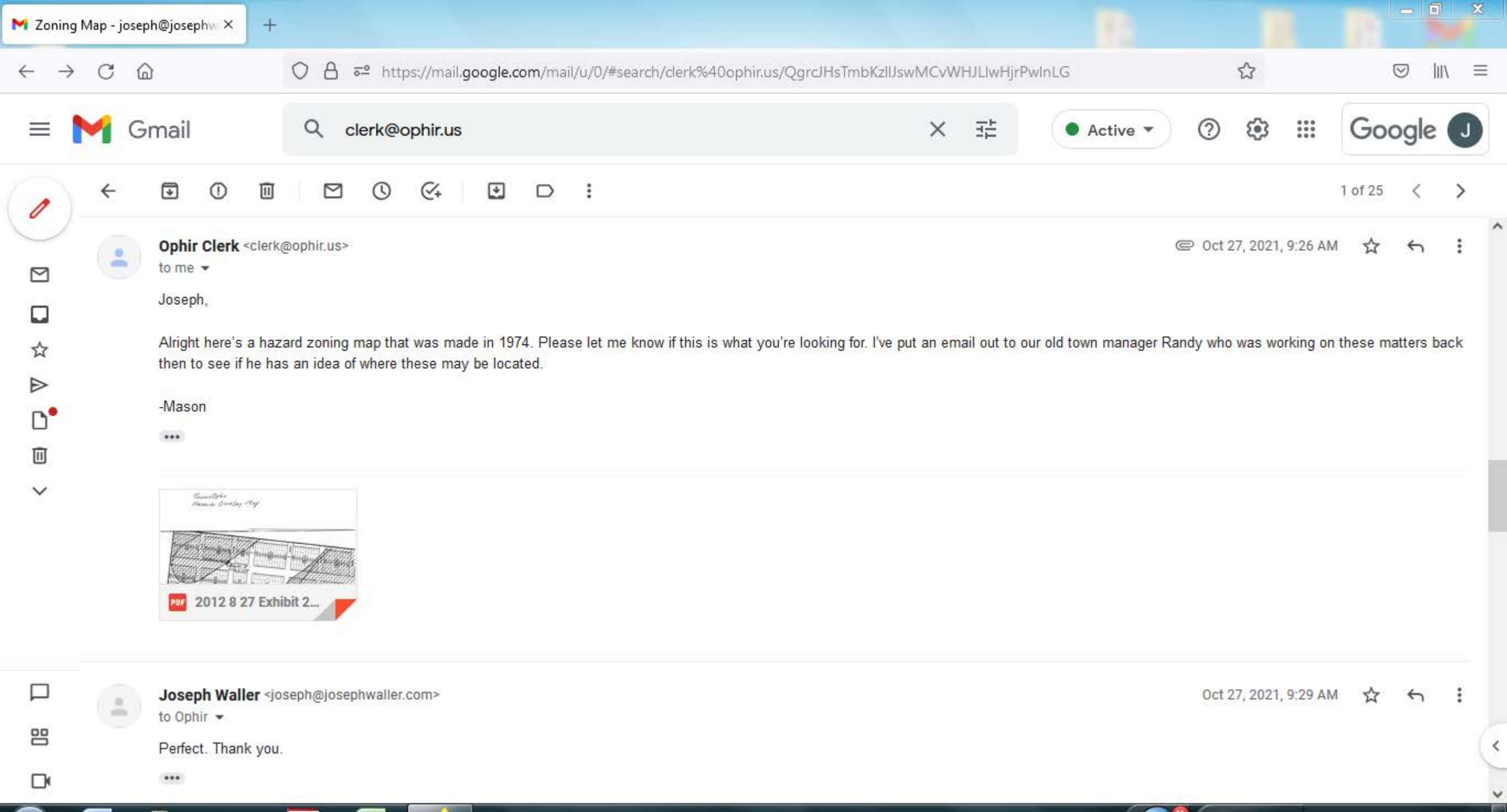


1994 - TOWN OF OPHIR HAZARDS OVERLAY MAP

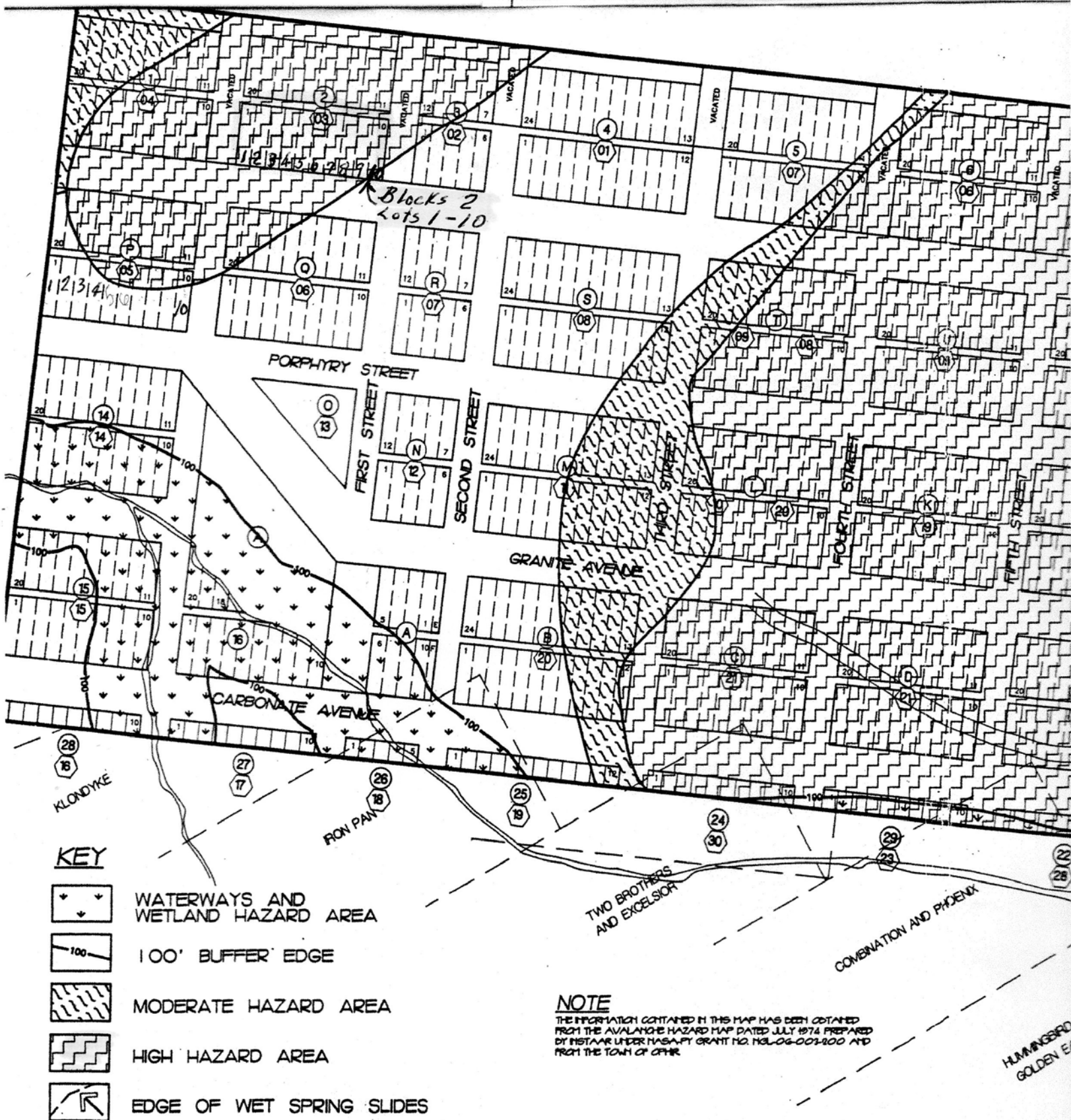


1974 - OPHIR TOWNSITE AVALANCHE HAZARD MAP - INSTAAR





Town of Ophir HAZARDS Overlay Map





TWO B
AND EXCELS

COMBINATION AND PH

NOTE

THE INFORMATION CONTAINED IN THIS MAP HAS BEEN OBTAINED
FROM THE AVALANCHE HAZARD MAP DATED JULY 1974 PREPARED
BY INSTAAR UNDER NASA-PY GRANT NO. NSG-06-003200 AND
FROM THE TOWN OF OPHIR

TOWN OF OPHIR, RESOLUTION 94-5

A RESOLUTION DECLARING AN INTENT TO CONSUMMATE A LAND TRADE TRANSACTION FOR THE PURPOSE OF PRESERVING AS OPEN SPACE CERTAIN LANDS SITUATED IN WATERFALL CANYON.

Whereas, the Town of Ophir's Master Plan, adopted September 21st, 1993, by the General Assembly, states in Section 2.6 that it is a goal to provide for the recreational and open space needs of the residents of the Town, and that it is an objective to maintain open space that preserves and enhances the natural environment within and surrounding the Town, and that it is the policy to provide active and passive recreation areas within and surrounding the Town for recreational needs defined by Town residents;

Whereas, the General Assembly finds that it is in the interests of the Health, Safety, and Welfare of the Ophir community to pursue the transaction described below; and,

Whereas, Resolution 94-4 did not accurately reflect the terms as negotiated between the parties;

NOW, THEREFORE, BE IT RESOLVED BY THE GENERAL ASSEMBLY OF THE TOWN OF OPHIR, COLORADO, the following:

SECTION 1. INTENT TO CONSUMMATE WATERFALL CANYON LAND TRADE

The General Assembly resolves to consummate the following described transaction (hereinafter referred to as the "Waterfall Canyon Land Trade") with Cariboo Partners, and Keith Williams and Robert Bristol, individually (hereinafter collectively referred to as "Williams/Bristol") and hereby directs Town staff to prepare all necessary documents and take all necessary actions to accomplish the purpose and intent of this Resolution upon written acceptance by Williams/Bristol as to the terms of this Intent to Consummate Waterfall Canyon Land Trade. The terms of this Resolution supersede and replace the terms of Resolution 94-4.

SECTION 2. TERMS OF WATERFALL CANYON LAND TRADE

A. Williams/Bristol agree to transfer property as described in the Warranty Deed recorded with the San Miguel County Recorder, Book 510, Page 521, to the Town of Ophir. The property rights transferred shall be of sufficient interest to insure the property is preserved and maintained as undeveloped open space. In the event that the transfer to the Town of Ophir does not qualify for tax exempt status and other tax benefits for Williams/Bristol, the property may be transferred to some other tax qualifying organization approved by both Williams/Bristol and the Town of Ophir. Williams/Bristol agree to transfer the property for the purposes of this section on June 21st, 1994, or as soon thereafter as possible.

B. The Town of Ophir agrees to transfer to Williams/Bristol 10 contiguous town-owned lots described in Block 11, exact Lots to be determined by Williams/Bristol. The Town of Ophir agrees to vacate the right-of-way West of, and adjacent to, Block 11, and transfer the the Town's interest in the vacated right-of-way to Williams/Bristol. The Town of Ophir and Williams/Bristol agree to take any necessary action to limit the number of building sites on the property transferred to Williams/Bristol to four single family detached dwelling units and accessory uses, including deed restrictions, covenants, replatting or creation of a zone district. The permitted land use shall otherwise be governed by the residential district regulations generally applied within the Town of Ophir as may be amended from time to time. Williams/Bristol agree that an 'inclusion fee' of \$5,500 (five thousand five hundred dollars) shall be payable to the East Ophir Improvement District Fund for each building site prior to obtaining a building permit for a dwelling structure, and such obligation shall run with the land.

C. The Town of Ophir agrees to adjust the boundary of the Avalanche Hazard Zone on the West side of Block 11 to the actual hazard boundary as delineated on the "Avalanche Hazard Map" prepared by INSTAAR under NASA-PY, prior to conveyance.

D. Williams/Bristol may plant trees, shrubs, and other vegetation in the Avalanche Hazard Zone on the Town-owned property transferred to them.

E. The Town of Ophir agrees to not allow or approve any transfer of density which is allowed, by right or review, elsewhere in the Town of Ophir to Town owned land in the remainder of Block 11 or to Blocks adjacent to Block 11. The Town of Ophir also agrees to restrict future development of town-owned land on Block 11 and block adjacent to Block 11 to single family detached dwelling units of a density no greater than one dwelling unit per 5,000 sq.ft. This restriction shall not prohibit the Town of Ophir from selling town-owned land for budgetary purposes, developing town-owned land for municipal purposes, or selling or trading town-owned land for the acquisition of open space outside the Town boundaries and in the Ophir Valley region.

F. Williams/Bristol may transfer land acquired from the Town of Ophir to a partner or partners of a partnership, or to a partnership or partnerships, of which Keith Williams or Robert Bristol is a partner, or has an interest in a partnership interest, one time without any obligation to the Town of Ophir for the Town's Real Estate Transfer Tax if such transfer is completed within two years of acquiring town-owned land. All partners shall be disclosed to the Town upon completing this land trade.

G. The Town of Ophir agrees to annex Lot 4 of the Sara Placer and the Montezuma Millsite upon petition for annexation to the Town of Ophir with the following land use restrictions and development rights:

(1) The annexed property may be subdivided into four residential lots, such subdivision shall comply with any subdivision regulations adopted by the Town of Ophir except as otherwise provided in this part G, and all structures shall be located on the South side of the Howard's Fork river.

(2) The annexed property shall not be required to be served by the Town of Ophir's water system.

(3) Structures on two of the lots will be restricted to a total maximum of 7,000 sq.ft. of floor area (including accessory buildings or structures) for each lot regardless of whether the property is annexed to the Town or not. Such restriction shall be in the form of a covenant or restrictive easement deeded to the Town. Development on the two lots shall comply with any exterior building material and exterior lighting regulations of the Town of Ophir. The Town of Ophir shall otherwise apply the land use regulations of the San Miguel County Land Use Code Forestry, Agriculture and Open zone district as written on April 15th, 1994, to development of the two lots.

(4) Use and development on two of the lots will be governed by the Town of Ophir's General Regulations and Residential Zone District Regulations.

(5) Town agrees not to oppose development activities in wetlands or wetland buffer zones upon verification by a mutually agreed upon wetlands professional or expert that the proposed development activity will not adversely affect wetlands.

(6) The Town of Ophir and Williams/Bristol agree to cooperate to create a trail access across the annexed property in the general area of the sluiceway currently crossing the property and to the Waterfall Canyon area provided neither the Town of Ophir nor Williams/Bristol incurs any liability associated with any trail construction, improvements, or use.

(7) William/Bristol agree to dedicate a 50 foot wide right-of-way to the Town of Ophir along the East boundary of Lot 4 of the Sara Placer. The Town of Ophir agrees to enter into a re-imbursement agreement with Williams/Bristol for the proportionate sharing of access development costs which benefits the Town of Ophir. The proportionate sharing of costs shall be determined by the number of building sites served and each share shall be payable by the owner of the property prior to obtaining a building permit for a dwelling structure.

(8) Williams/Bristol may transfer undeveloped annexed property or individual lots to a partner or partners of a partnership, or to a partnership or partnerships, of which Keith Williams or Robert Bristol is a partner, or has an interest in a partnership interest, one time without any obligation to the Town of Ophir for the Town's Real Estate Transfer Tax if such transfer is completed within two years of final approval of the annexation. All partners shall be

disclosed to the Town upon completing this land trade.

(9) Williams/Bristol agrees to pay all legal fees associated with annexation of Lot 4 of the Sara Placer and the Montezuma Mill Site.

SECTION 3. APPROVAL OF GENERAL ASSEMBLY REQUIRED

Consummation of the Waterfall Canyon Land Trade will require the approval of various ordinances by the General Assembly. This resolution in no way expresses whether necessary ordinances will be approved by the General Assembly.

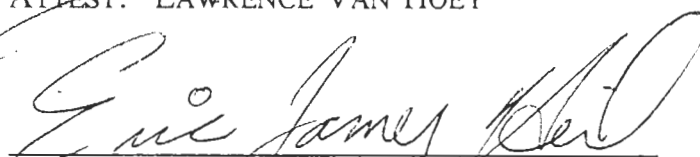
HEARD, APPROVED, AND ADOPTED BY THE GENERAL ASSEMBLY OF THE TOWN OF OPHIR THIS 17TH DAY OF MAY, 1994.


BY: PAUL MACHADO, TOWN MANAGER

5/18/94
DATE


ATTEST: LAWRENCE VAN HOEY

5/18/94 TOWN
DATE SEAL


APPROVED AS TO FORM: ERIC JAMES HEIL
TOWN ATTORNEY

5/18/94
DATE



RICHARD A. RONZIO COLLECTION

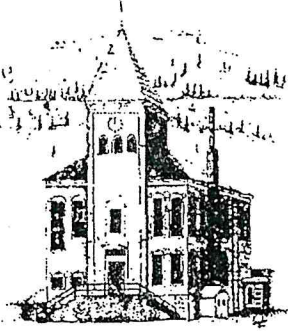
THIS BEAUTIFUL PICTURE of old Ophir was taken sometime between 1896 and 1910. This period was Ophir's most prosperous time, and the buildings look well cared for. The commercial buildings are identified on the map below. All of these buildings, except the

stamp mill and the school, were on Granite Avenue, the main business street of the town. Most of the other buildings in this photograph were residences. The ravine behind Ophir is Waterfall Gulch. This same photograph appears enlarged on the next three pages.









SAN MIGUEL COUNTY
Treasurer & Public Trustee

305 W. Colorado Avenue
PO Box 488, Telluride, CO 81435
(970) 728-4451
Fax: (970) 728-4397

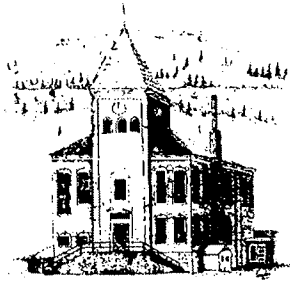
June 12, 2019

To Whom It May Concern:

According to the 1915-1928 San Miguel County Tax Rolls Lots 11 and 12, Block P, Ophir, were not assessed as having any improvements on them. Feel free to contact me if you have any questions.

Sincerely,

Brandi Hatfield
Chief Deputy Treasurer
San Miguel County



SAN MIGUEL COUNTY
Treasurer & Public Trustee

www.sanmiguelcountyco.gov

305 W. Colorado Avenue

PO Box 488, Telluride, CO 81435

(970) 728-4451

Fax: (970) 728-4397

Joseph Waller
480-639-7307
joseph@josephwaller.com

January 12, 2021

Re: Years 1915-1928; Ophir Blocks 1 (Lots 1-10), 2 (Lots 1-10), P (Lots 13-18), and Q (Blocks 16-20)

Dear Joseph Waller,

We researched the ownership of your request as best as possible. As far as we can tell, up until 1971 the Town of Ophir owned Block 1 & Block P. We were unable to find the Owners Tax record for Block 2 (Lots 7-10). Our research concludes:

Block Q (Lots 16, 17, 18, 19, & 20) showed improvements for all years.

Block 2 (Lots 3 & 4) showed improvements for all years.

Block 2 (Lots 1, 2, 5, & 6) Do NOT show improvements for all years.

Should you have any additional questions don't hesitate to reach out to our office.

Sincerely,

Chief Deputy Treasurer / Public Trustee
San Miguel County

5 of 11,143

Chris Wilbur <geowilbur@gmail.com> Jun 24, 2019, 7:39 AM ☆ ↩ ⋮

Thanks for the info. I'll ask Art if he remembers anything about "houses 1 & 2". Why would they publish that if it were not true or verified? Could it have been the April 1959 wet slide?

Chris

Wilbur Engineering, Inc.

www.mearsandwilbur.com

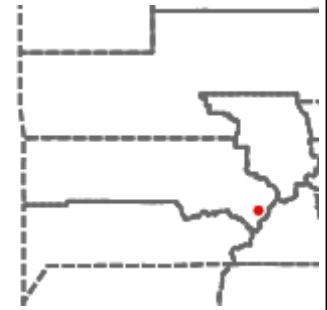
Joseph Waller Jun 24, 2019, 12:01 PM ☆

Chris: I will have the Treasurer research 1959 as well.

Joseph Waller Jun 24, 2019, 6:46 PM

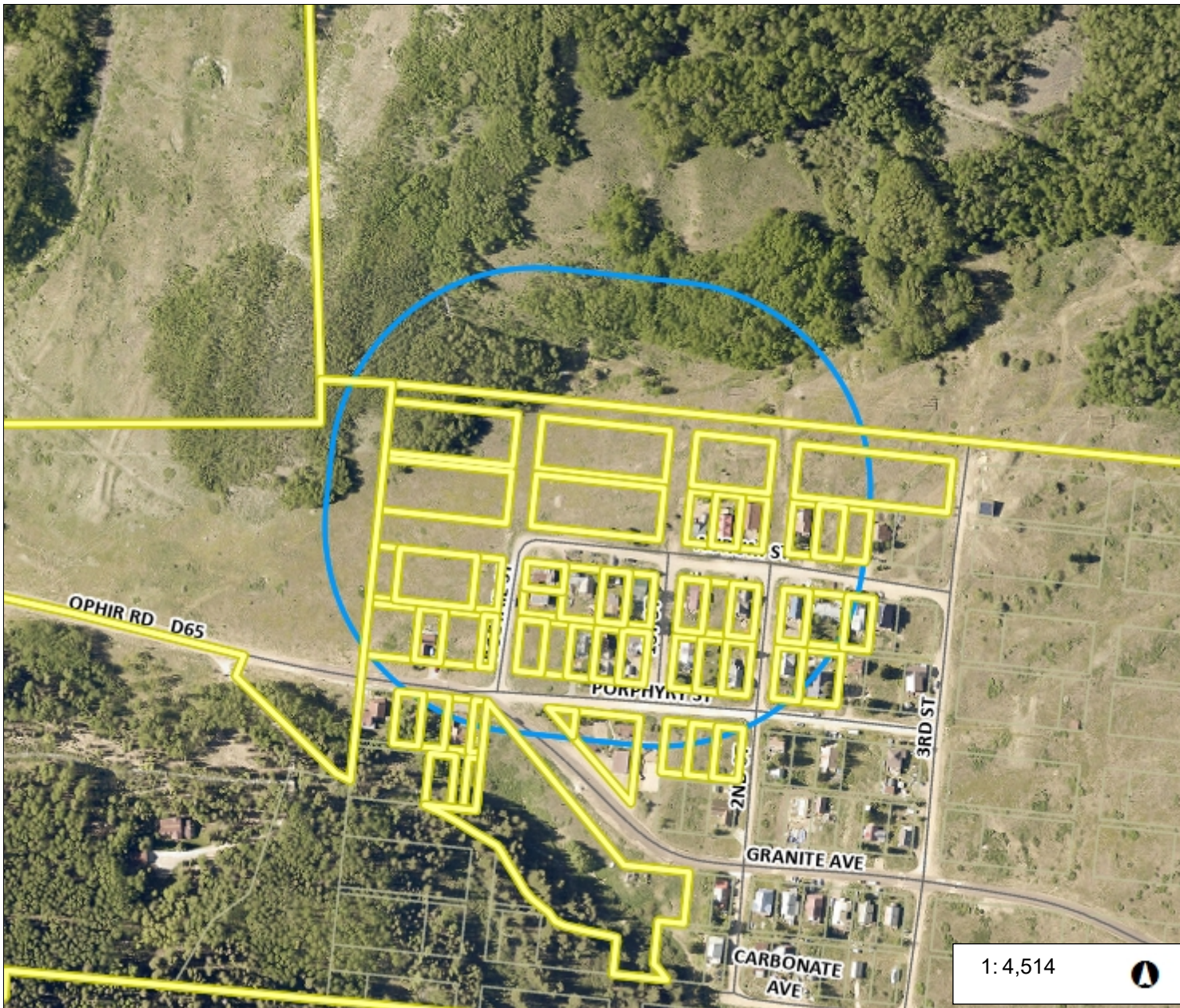


Cornwall-Whitaker 400ft public noticing area



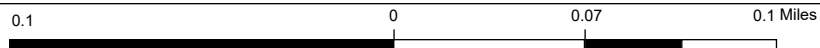
Legend

- San Miguel Road Label
- Road
- Tax Parcels cache
- Tax Parcel



Map Generated
6/26/22 1:20 PM

Notes



This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

THIS MAP IS NOT TO BE USED FOR NAVIGATION
www.sanmiguelcountyco.gov

NOTICE OF PENDING TOWN OF OPHIR HAZARD MAP AMENDMENT

June 19, 2022

RE: Planning & Zoning Hearing for Recommendation to General Assembly

Dear Property Owner,

You are receiving this public notice as required by the Town of Ophir Land Use Code because you own property within 200 feet of a proposed Avalanche Hazard Map change.

Notice is hereby given that on **July 7, 2022 at 7:00 PM**, or as soon as possible thereafter, in Ophir Town Hall, 36 Porphyry St., Ophir, Colorado, or at such other time and place as this hearing may be adjourned, a public hearing will be held to consider:

Project Name: Cornwall Property

Project Summary: The evaluation of avalanche hazard and mapping within lots 1-10, block two, Article 804 overlay adjustment, Appendix C Town of Ophir Hazards Map.

Action Sought: Removal of lots 1-10, block two from the high hazard area designation on the Town of Ophir Hazards Map.

Legal Description: Lots 1-10, Block Two, Town of Ophir, Colorado

Address: TBD Aurum Street

Owner and Applicant: Joyce Whitaker, David Cornwall

Authorized Agent: Joseph Waller, joseph@josephwaller.com

More complete information is on file and available at Town Hall, 36 Porphyry St., Ophir, CO. (970)728-4943. If you would like your concerns noted and reviewed prior to the hearing date, please forward your written comment letter to:

Town of Ophir Planning and Zoning Commission

P.O. Box 683

Ophir, CO 81426

or

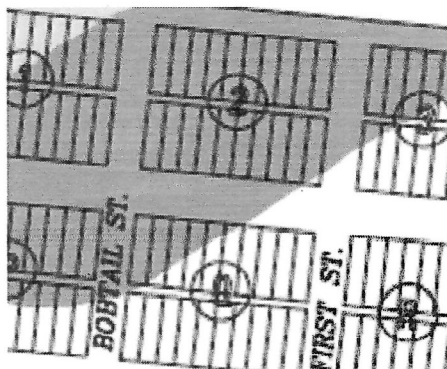
Email document attachment with an email owned by the commenting individual to:

clerk@ophir.us

or

Deliver in person to:

Ophir Town Hall at the physical address listed above.



AFFIDAVIT

Before the Planning and Zoning Commission of the Town of Ophir, Colorado:

Project Name: Cornwall Property

Project Summary: The evaluation of avalanche hazard and mapping within lots 1-10, block two, Article 804 overlay adjustment, Appendix C Town of Ophir Hazards Map.

Legal Description: Lots 1-10, Block Two, Town of Ophir, Colorado

Address: NA

Owner: Joyce Whitaker, David Cornwall

Applicant: Joseph Waller

AFFIDAVIT OF (Name) Kristin Froberg

The undersigned, being first duly sworn, states and declares as follows:

1. That upon examination of a scaled map of the Town of Ophir, I determined which properties are within ^{four} two hundred feet, exclusive of streets and alleys, of the property which is the subject of this affidavit; and
2. That upon examination of the public records of the office of the San Miguel County Assessor, I verified the owners of record of property within two hundred feet of the property which is the subject of this affidavit; and
3. Being duly authorized, I placed a true and accurate copy of the Notice of Public Hearing addressed to the property owners of record which I verified to be within two hundred feet of the subject property, a copy of which is attached hereto and incorporated herein by this reference, in the United States Mail, first class postage prepaid on the 23rd day of June, 2022 to individual homeowners or by hand-delivery so long as such delivery is accomplished by leaving notice with an adult property owner at least ten (10) days prior to the public hearing. *confirmed that a representative*
4. Being duly authorized, I ^{posted} ~~posted~~ Notice of Public Hearing consisting of a sturdily mounted poster at least 24" x 36" in size at a conspicuous location on the subject property at least ten (10) days prior to the public hearing.

FURTHER AFFIANT SAYETH NOT.

Kristy
Signature

STATE OF COLORADO)

) SS.

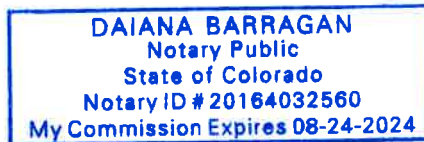
COUNTY OF SAN MIGUEL)

The foregoing declaration was sworn to before me this 6 day of 30th
by Kristin Troberg.

WITNESS my hand and official seal.

My commission expires: 8-24-24

Maane Barragan



Notary Public

OPHIR ZONING
ORDINANCE NO. 1

AN ORDINANCE TO REGULATE AND RESTRICT THE HEIGHT, NUMBER OF STORIES, AND SIZE OF BUILDINGS AND OTHER STRUCTURES; THE PERCENTAGE OF LOT THAT MAY BE OCCUPIED; THE SIZE OF YARDS, COURTS AND OTHER OPEN SPACES; THE DENSITY OF POPULATION; AND THE LOCATION AND USE OF BUILDINGS, STRUCTURES, AND LAND FOR TRADE INDUSTRY, RESIDENCE, OR OTHER PURPOSES IN OPHIR, COLORADO; TO REGULATE AND REDISTRIBUTE THE ERECTION, CONSTRUCTION, RECONSTRUCTION, ALTERATION, REPAIR, OR USE OF BUILDINGS, STRUCTURES, OR LAND IN THE AFOREMENTIONED AREA; TO DIVIDE THE SAID AREA INTO ZONING DISTRICTS AND PROVIDE FOR THE BOUNDARIES OF SAID DISTRICTS AND THE MANNER IN WHICH SAID DISTRICTS SHALL BE DETERMINED, ESTABLISHED, AND ENFORCED, AND FROM TIME TO TIME AMENDED, SUPPLEMENTED, OR CHANGED; BY PROVIDING FOR ZONING CERTIFICATES AND APPLICATIONS; BY MAKING CERTAIN EXCEPTIONS; BY CREATING THE OFFICE OF ZONING INSPECTOR AND BOARD OF ADJUSTMENT; BY PROVIDING FOR THE ENFORCEMENT OF AND THE PENALTIES FOR THE VIOLATION OF ANY OF ITS PROVISIONS; FOR THE PURPOSE OF PROMOTING HEALTH, SAFETY, MORALS, AND GENERAL WELFARE OF THE COMMUNITY.

NOW THEREFORE, be it ordained by the TOWN BOARD OF the Town of T OPHIR, Colorado:

ARTICLE I
PRELIMINARY PROVISIONS

SECTION 101. TITLE

This ordinance shall be known as the Zoning Ordinance of Ophir, Colorado.

SECTION 102. CONTENT

This ordinance includes a map designated as the official Zoning Map of Ophir, Colorado. This Zoning Map and all notations, references, and other information shown on it are part of this ordinance and have the same effect as if fully set forth in this ordinance.

SECTION 103. FILING

This ordinance, together with the Zoning Map which is part of it, is on file in the Office of the County Recorder and a certified copy is on file with the Town Clerk.

SECTION 104. LEGISLATIVE INTENT

The Board of Trustees of The Town of Ophir has received the report of the zoning commission heretofore appointed which final report includes a comprehensive plan and proposed form of zoning ordinance and it is therefore declared by the Board of Trustees that it is necessary to the public health, welfare and safety, to adopt the within Zoning Ordinance as it provides the Town of Ophir with a comprehensive plan and furnishes a design to lessen congestion in the streets; to promote health and general welfare; to provide adequate light and air; to prevent the overcrowding of

population; and this ordinance accomplishes these objectives taking into consideration in particular, the character of the existing uses of lands and improvements within the Town of Ophir and reasonable conserve the value of the buildings now in existence and encourages the most appropriate use of land throughout the town.

ARTICLE II DEFINITIONS

SECTION 201. DEFINITIONS

For the purpose of this ordinance, the following words and phrases shall have the following meaning:

201.1 Accessory Building: A detached subordinate building, the use of which is customarily incidental to that of the main building or to the main use of the land and which is located on the same lot or parcel with the main building or use. Accessory buildings shall not be provided with kitchen facilities sufficient to render them suitable for permanent residential occupancy.

201.2 Alley: A public way permanently reserved as a secondary means of access to abutting property.

201.3 Building: Any permanent structure built for the shelter or enclosure of persons, animals, chattels or property of any kind, and not including fences.

201.4 Building, Height of: The vertical distance from the average elevation of the ground around the structure to the highest point of coping of a flat roof, or to the deck line of a mansard roof, or to the meanheight level between eaves and ridge for gable, hip or gambrel roofs.

201.5 Commission: The Planning Commission of Ophir, Colorado.

201.6 Condominium: A building, or buildings, consisting of separate fee simple estates to individual units of a multi-unit property together with an undivided fee simple interest in common elements.

201.7 Dwelling: A permanent building or portion thereof: which is used as the private residence or sleeping place of one or more human beings, but not including hotels, motels, tourist courts, resort cabins, clubs, or hospitals: and not including temporary structures such as tents, railroad cars, trailers, street cars, metal prefabricated sections, or similar units.

201.8 Dwelling, One-Family: A detached building containing only one dwelling unit.

201.9 Dwelling, Two-Family: A detached building containing only two dwelling units.

201.10 Family: Any individual, or two (2) or more persons related by blood or marriage or between whom there is a legally recognized relationship, or a group of not more than five (5) unrelated persons, excluding servants, occupying the same dwelling unit.

201.11 Floor Area: The sum of the gross horizontal areas of all floors of a building measured from the exterior faces of the exterior walls or from the center line of walls separating buildings, but not including cellar or basement space not used for retailing.

201.12 Garage, Private: A building used only for the housing of motor vehicles, without their equipment for operation, repair, hire or sale.

201.13 Home Occupation: Any business conducted principally within a dwelling unit, an enclosed garage or accessory building and carried on by the inhabitants, which use is clearly incidental and secondary to the use of the dwelling for dwelling purposes and does not change the character thereof.

201.14 Lot: A parcel of real property as shown with a separate and distinct number or letter on a plat recorded in the San Miguel County Court House, or when not so platted, in a recorded subdivision; a parcel of real property abutting upon at least one public street and held under separate ownership.

201.15 Lot Line, Front: The property line dividing a lot from the street.

201.16 Lot Line, Rear: The line opposite the front lot line.

201.17 Lot Area: The total horizontal area within the lot lines of a lot.

201.18 Lot of Record: A lot or parcel of land, the deed to which has been recorded in the office of the County Recorder prior to the adoption of this ordinance.

201.19 Mobile Home: Any vehicle or similar portable structure originally constructed to have no foundation other than wheels, jacks or post and so designed or constructed to permit occupancy as living or sleeping quarters.

201.20 Non-Conforming Buildings: A building or structure or portion thereof conflicting with the provisions of this ordinance applicable to the zone in which it is situated.

201.21 Non-Conforming Use: The use of a structure or premises or any portion thereof conflicting with the provisions of this ordinance.

201.22 Natural Materials: Stone, wood, or stained wood.

201.23 Occupied: The word "occupied" includes arranged, designed, built, altered, converted, rented or leased, or intended to be occupied.

201.24 Open-use Recreation Site: Land devoted to the public use for recreation, including such facilities as playgrounds and play-fields, golf, tennis and similar court installation.

201.25 Recreation Club: A building devoted to public use including such facilities as golf club house, swimming pool club house, tennis club house, playground and play-field activity centers, or club houses, and may include kitchen facilities, assembly hall, meeting rooms, locker facilities, etc.

201.26 Sign: Any device fixed to, painted on or incorporated in the building surface, or displayed from or with a building or structure, or free standing upon the site and which is visible from the public right-of-way; designed to convey or direct a message to the public concerning the identification of the premises or to advertise or promote the interests of any private or public firm, person or organization.

201.27 Street: A public way other than an alley, which affords the principal means of access to abutting property.

201.28 Structure: Anything constructed or erected, which requires location on the ground or attached to something having a location on the ground, but not including fences or walls used as fences less than six feet (6) in height.

201.29 Use: The purpose for which land or a building is designated, arranged, or intended, or for which it either is or may be occupied or maintained.

201.30 Yard: A space on the same lot with a principal building open, unoccupied, and unobstructed by buildings or structures from the ground upward, except as otherwise provided herein.

201.31 Yard, Front: A yard extending the full width of the lot or parcel, the depth of which is measured in the least horizontal distance between the front lot line and the nearest wall of the principal building; such distance being referred to as the front yard setback.

201.32 Yard, Rear: A yard extending the full width of the lot or parcel, the depth of which is measured in the least horizontal distance between the rear lot line and the nearest wall of the principal building; such depth being referred to as the rear yard setback.

201.32 Yard Side: A yard extending from the front yard to the rear yard, the width of which is measured in the least horizontal distance between the side lot line and the nearest wall of the principal building.

201.33 Yard, Service: Any yard area utilized for storage of materials accessory to, or used in conjunction with the principal use of the lot or building. or used for garbage or trash containers, or for the location of mechanical equipment accessory to the principal building or use.

201.34 Utilites: All poles, lines, cables or other transmission or distribution facilites of public utilities.

ARTICLE III GENERAL PROVISIONS

SECTION 301. DISTRICTS

For the purposes of thes ordinance, the Town of Ophir, Colorado, is hereby divided into three zoning districts to be known as follows:

RESIDENTIAL DISTRICT
OPEN SPACE DISTRICT
AVALANCHE HAZARD DISTRICT

SECTION 302. ZONING MAP

The boundaries of these districts are shown of the official Zoning Map entitles "Zoning District Map" of the Town of Ophir, Colorado, which accompanies and is made a part of this ordinance. The original of this map is properly attested to, and is on file with the Town Clerk, and said map and all information shown thereon shall the same force and effect as if fully set forth or described herein.

SECTION 303. GENERAL REQUIRMENTS

303.1 No building shall be eredited, converted, enlarged, moved or structurally altered, nor shall any building or premises be used for any prtpose other than permitted in the district in which such building or premises is located. No building shall be erected, enlarged, moved or structurally altered except in conformity with the height, yard and other regulations prescribed herein for the district in which such lot is located; every part of a required yard shall be open to the dky, unobstructed, except as hereinafter provided; and no yard of lot area shall be reduced so as to be smaller than the applicable district requirements.

303.2 Every building hereinafter erected or structurally altered shall be located on a lot as defined in Section 201.14, and in no case shall more than one residential building be located on a lot.

303.3 All building's exterior siding shall be of natural materials.

ARTICAL IV
RESIDENTIAL DISTRICT

SECTION 401. RESIDENTIAL DISTRICT USE REGULATIONS

Intention: To allow utilization of land for residential purposes and customary accessory uses. Recreational and institutional uses customarily found in the proximity with residential uses are included.

SECTION 402. USES-PERMITTED

402.1 One family dwelling, two family dwelling, accessory buildings and use, home occupations.

402.2 Fences, hedhes or walls subject to requirements under supplementary regulations.

SECTION 403. USES-CONDITIONAL

403.1 Recreational Club, open use recreation subject to the approval of the Board of Trustees.

403.2 School, church, hospital or public building subject to the approval of the Board of Trustees.

SECTION 404. MINIMUM LOT AREA (per dwelling)

404.1 5,000 square feet per dwelling unit.

SECTION 405. MINIMUM FRONT YARD

405.1 Buildings.....10 feet.

405.2 Corner Lots: (both streets).....10 feet, front; 5 feet, side.

SECTION 406. MINIMUM SIDE YARD

406.1 All Buildings.....5 feet.

SECTION 407. MINIMUM REAR YARD

407.1 All Buildings.....10 feet

SECTION 408. MAXIMUM BUILDING HEIGHT

408.1 All Buildings.....25 feet.

SECTION 409. MINIMUM ROOF PITCH

409.1 All Buildings....1 to 4.

ARTICLE V
OPEN SPACE DISTRICT

SECTION 501. INTENT AND PURPOSE

To insure that land intended for open space use is retained and developed in such a manner that the land retains its natural character and intended use while not exerting a disruptive influence on adjacent uses of land.

SECTION 502. LIMITATIONS OF ZONE DISTRICT

This zone district shall be applicable only to land dedicated to and/or owned by the Town of Ophir or San Miguel County, unless specifically requested by a private property owner within the Town limits of the Town of Ophir.

SECTION 503. USES PERMITTED

503.1 Open space recreation uses which shall include the retention of land in its natural state and/or the provision of such uses which are compatible with the natural state and/or the provision of such uses which are compatible with the natural environment to include but not be limited to walking and hiking trails, nature trails, etc. Uses permitted shall include necessary access for public utilities and pedestrian bridges. Vehicular bridges and roads shall be permitted only after notice and public hearing before the Board of Trustees. Vehicular bridges and roads, if approved, shall be closed to public traffic. Also, certain areas of the open space district may be fenced for the protection of certain natural features. If such areas are fenced, the fencing shall be limited to a height of 36 inches.

503.2 Riverfront open space uses which shall include but not be limited to walking and hiking trails, bike paths, occasional benches and other such passive recreation uses. Uses permitted shall include necessary access for public utilities and pedestrian bridges. Vehicular bridges and roads shall be permitted only after notice and public hearing before the Board of Trustees. Vehicular roads, if approved, shall be closed to public traffic. Flood control activities within the riverfront open space district shall be limited to proper rip-rap and natural vegetation types of control measures.

SECTION 504. USES NOT PERMITTED

It is the specific intent of this ordinance to limit the range of uses in the open space district. All active recreation uses such as playfields, campgrounds, court installations, activity centers, permanent buildings and any other similar uses are not included within this district.

ARTICLE VI
AVALANCHE HAZARD ZONE

SECTION 601. INTENTION

To define areas where avalanches may pass over the ground and to restrict buildings on these areas.

SECTION 602. USE PERMITTED

Open space recreation.

ARTICLE VII
SUPPLEMENTARY REGULATIONS

SECTION 701

Regulations specified in other sections of this ordinance shall be subject to the following interpretations and exceptions:

701.1 All fuel storage tanks shall be completely buried beneath the surface of the ground.

701.2 Utilities; Nothing in these regulations shall be construed to prevent the construction or installation, in any zone district, of a public utility use or structure necessary for the transmission of commodities or services of a utility company including mains, transmission and distribution lines, sub-stations and exchanges, provided that all mains, transmission and distribution lines are completely buried beneath the surface of the ground.

ARTICLE VIII
ADMINISTRATION AND ENFORCEMENT

SECTION 801 ADMINISTRATION

801.1 Enforcing Official: The provisions of this ordinance shall be administered and enforced by the Building Inspector of the Town of Ophir, his authorized representative and or such other authority as appointed by the Board of Trustees.

801.2 Right to Trespass: The Building Inspector or any duly authorized person shall have the right to enter upon any premises at any reasonable time for the purpose of making inspections of buildings or premises necessary to carry out his duties in the enforcement of this ordinance.

802.2.1 Liability of building inspector
The Building Inspector or any employee charged with the enforcement of this Code, acting in good faith and without malice for the Town in the discharge of his duties, shall not thereby render himself liable personally and he is hereby relieved from all personal liability for any damage that may accrue to persons or property as a result of any act required or by reason of any act or omission in the discharge of his duties. Any suit brought against the Building Inspector or employee, because of such act or omission performed by him in the enforcement of any provisions of this code, shall be defended by the legal department of the Town until final termination of the proceedings.

801.3 Stop Orders: Whenever any building work is being done contrary to the provisions of this ordinance, the Building Inspector may order the work stopped by notice in writing served on any person engaged in doing or causing such work to be done, and any such person shall forthwith stop such work until authorized by the Building Inspector to proceed with the work.

801.4 Zoning Permit Required: It shall be unlawful to commence the excavation for or the construction of any building or other structure, including accessory structures until the Build-

The Inspector of the Town has issued a zoning permit for such work.

801.5 Application for Permit: Application for a zoning permit shall be made to the Building Inspector of the Town on forms provided for that purpose.

801.6 Requirements for Permits: The Building Inspector of the Town shall require that every application for a zoning permit shall be accompanied by two (2) copies of a plan or plat drawn to scale and showing the following in sufficient detail to enable the Building Inspector to ascertain whether the proposed excavation, construction, reconstruction or conversion, moving or alteration is in conformance with this ordinance.

801.6.1 Lot Dimensions and Corners: The actual shape, proportion and dimensions of the lot to be built upon, and satisfactory evidence that actual corners of the lot are known and are established on the ground.

801.6.2 Proposed Structures: The shape, size and location of all buildings, fences, or other structures to be erected, altered or moved and of any buildings, fences, or other structures already on the lot.

801.6.3 Use of Structures: The existing and intended use of all such buildings or other structures.

801.6.4 Existing Yards: The dimensions of all yards and such other information concerning the lot or adjoining lots as may be essential for determining whether the provisions of this ordinance are being observed regarding yards, areas, and other such requirements or standards.

801.6.5 Building Code: Any other information as required by the Building Code.

801.7 Issuance of Permit: If the proposed excavation, construction, moving or alteration as set forth in the application is in conformity with the provisions of this ordinance and all other ordinances of the Town, the Building Inspector of the Town shall issue a zoning permit.

801.8 Disapproval of Permit Request: If an application for a zoning permit is not approved, the Building Inspector of the Town shall state in writing on the application the reason for such disapproval.

801.9 Null or Void Permits: Any permit issued in conflict with the provisions of this ordinance shall be null and void and may not be construed as waiving any provision of this ordinance.

801.10 Certificate of Occupancy Required: After the effective date of this ordinance, no change in the use or occupancy of land, nor any change of use or occupancy in an existing building other than for single family residence shall be made, nor shall any new building be occupied for any purpose other than single family residence until a certificate of occupancy has been issued.

801.11 Record Kept by Building Inspector: A record of all certificates of occupancy shall be kept on file in the office of the Building Inspector, and copies shall be furnished on request to and at the expense of any person having a proprietary or tenancy interest in the land or building affected by such certificate of occupancy.

801.12 Appeal from Decisions: The applicant may appeal said order to the Town Board of Trustees, Town of Ophir, Colorado, in the following manner: The aggrieved applicant must file notice of appeal with the Town Clerk of the Town of Ophir within 45 days of the mailing of the said written order of building inspector. The Town Clerk shall place said appeal on the agenda of the Town Board. The Town Board of Trustees shall consider the recommendations of the building inspector and the arguments of the aggrieved applicant, and shall, within 45 days of the filing of said appeal, either confirm the order of the Building Inspector, or over rule the Building Inspector and order the Building Inspector to grant a Building Permit.

ARTICLE IX AMENDMENTS

SECTION 901 PROCEDURE

901.1 Amendments, supplements, changes or repeal of this ordinance or any article thereof, or to the official zoning map may be initiated by application of:

- 901.1.1 Any citizen or group of citizens, firm or corporation residing, owning or leasing property in the Town;
- 901.1.2 By the Planning Commission;
- 901.1.3 The Board of Trustees.

901.2 Application for an amendment to this ordinance shall be made on such a form as the Planning Commission shall prescribe and shall be filed with the Town Clerk. Application for an amendment to the official zoning map shall contain all of the following information:

901.2.1 Description of land area to be re-zoned, and requested new classification along with a sketch to scale showing boundaries of area requested to be re-zoned, along with an indication of the existing zoning on all adjacent sides of the area.

901.2.2 A statement of justification for the rezoning, including one of the following conditions: (1) Changing area conditions (2) error in original zoning; (3) Conformance to Master Plan for area; or, (4) peculiar suitability of the site to a certain use.

901.2.3 Description and sketches, if available, of buildings or uses proposed if re-zoning is granted, along with a description of land and building uses within 200 feet of the proposed area of change, in all directions.

901.2.4 Time schedule for any contemplated new construction or uses.

901.2.5 Justification for any new business or industrial zoning.

SECTION 902

All applications for changes to the zoning ordinance or map shall be referred by the Town Clerk to the Planning Commission, which commission shall return a recommendation either recommending for or against the proposed change to the Board within Fifteen (15) days of the receipt thereof.

SECTION 903 Before any amendment to this ordinance or map is enacted, a public hearing shall be held, fifteen (15) days advance notice of the time and place of which shall be published in a newspaper having general circulation within the Town, and, also such notice shall be mailed fifteen (15) days prior to such hearing by certified mail to the owners of land within one hundred (100)

feet of the area affected by the proposed amendment or change to the zoning map. All such mailing and publication expense shall be paid by the applicant.

SECTION 904 The adoption of any amendment shall require the favorable vote of a majority of the Board of Trustees, except, however, a favorable vote of three-fourths ($3/4$) of the Board of Trustees shall be required when there is filed a protest against a map change by the owners of more than twenty (20) per cent of the property:

- 904.1 Within the proposed area of change, and/or;
- 904.2 Immediately adjacent thereto and to the rear extending one hundred feet (100) and/or
- 904.3 Facing the proposed change directly across a street and or alley, and extending one hundred feet (100) from the street or alley frontage.
- 904.4 An amendment or map change that has not been recommended by the Planning Commission.

SECTION 1001 PENALTY

Violation of any Article, section, or subsection of the ordinance is hereby deemed to be a misdemeanor and any person found guilty hereunder shall be fined not less than \$5.00 nor more than \$300.00 or sentenced to jail for a term of not less than 1 day nor more than 90 days or by both such fine and sentence. Every day this ordinance is violated shall constitute a separate offense.

SECTION 1002 COMPLAINTS

Any person aggrieved by a violation or apparent violation of the provisions of this ordinance may file a written complaint with the building inspector, who shall immediately investigate such complaint and take legal action to have the violation penalized and removed if such a violation is found to exist.

SECTION 1003 INTERPRETATION CONFLICTS AND VALIDITY

The provisions of this ordinance shall be interpreted and applied to be the minimum required for the proper protection of the public health and morals, and the promotion of safety and general welfare of the residents of the Town of Ophir.

SECTION 1004 CONFLICT

Whenever these requirements are at variance with the requirements of any other lawfully adopted rules, regulations, resolutions or ordinances, the one which is the most restrictive, or which requires the higher standard shall apply.

SECTION 1005 SEVERABILITY

If any part or parts of this ordinance or any article hereof are for any reason to be held invalid or unconstitutional, such decision shall not affect the validity or constitutionality or the enforceability of the remaining portions of this ordinance.

The Board of Trustees hereby declares that it would have passed this ordinance and each part or parts may thereof, irrespective of the fact that any one part or parts may be declared invalid or unconstitutional.

SECTION 1006 ADOPTION OF BUILDING CODE

There is hereby adopted by the Town of Ophir, State of Colorado for the purpose of establishing rules and regulations for the construction, alteration, removal, demolition, equipment, use and occupancy, location and maintenance of buildings and structures including permits and penalties that certain building code known as the National Building Code, Abbreviated Edition, recommended by the American Insurance Association, successor to the National Board of Fire Underwriters, being particularly the 1967 edition thereof and the whole thereof, save and except such portions as are hereinafter deleted, modified or amended, of which not less than (1) copy have been and now are filed in the office of the Clerk of the Town of Ophir, State of Colorado, and the same are hereby adopted and incorporated as fully as is set out at length, herein, and from the date on which this ordinance shall take effect the provisions thereof shall be controlling in the construction of all buildings and structures therein contained within the corporate limits of the Town of Ophir, State of Colorado.

SECTION 1007 FEES

No permit as required by the Building Code shall be issued until the fee prescribed in this Ordinance shall have been paid. Nor shall an amendment to a permit be approved until the additional fee, if any, due to an increase in the estimated cost of the building or structure, shall have been paid.

1007.2 The permit issued pursuant to this Ordinance shall also contain and include the permits required by the Zoning Ordinance of the Town of Ophir and the fee designated in this section shall include any fee required by said Zoning Ordinance.

1007.3 For a permit for the construction or alteration of a building or structure, the fee shall be, including said zoning fee, no fee where the estimated cost of the project is less than five hundred dollars (\$500.00); for estimated cost more than five hundred dollars (\$500.00) a fee of ten (\$10.00) dollars for the first one thousand dollars (\$1000.00) and an additional fee of one dollar (\$1.00) per additional one thousand dollars (\$1000.00) or estimated cost.



Building
Ordinance

ANCE TO REGULATE AND RESTRICT THE HEIGHT, NUMBER OF STORIES, AND SIZE OF BUILDINGS AND OTHER STRUCTURES; THE PERCENTAGE OF THE LOT THAT MAY BE OCCUPIED; THE LOT YARDS; THE DENSITY OF POPULATION; AND THE LOCATION AND USE OF BUILDINGS, LOTS, LOTS, AND LAND FOR RESIDENCES OR OTHER PURPOSES IN OPHIR, COLORADO. TO REGULATE THE ERECTION, CONSTRUCTION, RECONSTRUCTION, ALTERATION, USE AND REPAIR OF BUILDINGS, STRUCTURES OR LAND IN OPHIR. TO DIVIDE OPHIR INTO ZONING DISTRICTS AND TO DEFINE FOR THE BOUNDARIES OF SAID DISTRICTS AND THE MANNER IN WHICH SAID DISTRICTS SHALL BE DETERMINED, ESTABLISHED AND ENFORCED, AND FROM TIME TO TIME AMENDED, SPLIT, OR CHANGED; BY PROVIDING FOR BUILDING PERMITS AND APPLICATIONS; BY CREATING AN OFFICE OF BUILDING INSPECTOR; BY PROVIDING FOR THE ENFORCEMENT OF AND THE PENALTIES FOR THE VIOLATION OF ANY OF ITS PROVISIONS; FOR THE PURPOSE OF PROMOTING THE HEALTH, SAFETY AND GENERAL WELFARE OF THE COMMUNITY.

AND THEREFORE be it ordained by the General Assembly of the Town of Ophir, Colorado,

ARTICLE I

PRELIMINARY PROVISIONS

Section 101. Title

This Ordinance shall be known as the Zoning Ordinance of Ophir, Colorado.

Section 102. Content

This Ordinance contains a map designated as the Official Zoning Map of Ophir, Colorado. This Zoning Map, and all notations, references and other information shown on it are part of this Ordinance and have the same effect as if fully set forth.

Section 103. Filing

This Ordinance, together with the Zoning Map which accompanied it is on file with the San Miguel County Clerk and a certified copy is on file with the Town Clerk of Ophir.

Section 104. Legislative intent

The Town of Ophir declares that in the interest of protecting our most precious resource, the natural environment, while at the same time allowing for use of the land, this Zoning Ordinance shall be adopted. The Zoning Ordinance provides the Town of Ophir with a comprehensive plan and orderly design to lessen congestion in the streets, to prevent the overcrowding of population, to promote health and general welfare, to provide adequate light and air, and to provide a safe environment in which its residents can live. It is the intent of the General Assembly to maintain the historical flavor of the town, while allowing for harmonious new construction.

ARTICLE II

DEFINITIONS

Section 201. Definitions

For the purpose of this Ordinance, the following words and phrases shall have the following meaning:

Accessory Building: A detached subordinate building, the use of which is customarily incidental to that of the main building or to the main use of the land and which is located on the same lot or parcel with the main building or use. Accessory buildings could not be provided with kitchen facilities sufficient for rendering them suitable for permanent residential occupancy.

Alley: A public way permanently reserved as a secondary means of access to a property.

Building: Any permanent structure built for the shelter or enclosure of persons, animals or property of any kind, not including furniture.

Building, Height of: The vertical distance from the average elevation of the ground around the structure to the highest point of coping of a flat roof, or to the depth of an mansard roof, or to the mean height level between the eaves and ridge for gable, hip or gambrel roofs.

Condominium: A building, or buildings, consisting of separate fee simple estates in individual units to individual units of a multi-unit property together with an undivided fee simple interest in common elements.

Dwelling: A permanent building or portion thereof which is used as the private residence or sleeping place of one or more human beings, but not including hotels, motels, tourist cabins, resort cabins, clubs or hospitals, and not including temporary structures such as tents, railroad cars, trailers, street cars, metal prefabricated sections, or similar units.

Dwelling, One-Family: A detached building containing only one dwelling unit.

Dwelling, Two-Family: A detached building containing two dwelling units.

Family: Any individual, or two or more persons related by blood or by marriage or between whom there is a legally recognized relationship, or a group of not more than five unrelated persons, excluding servants, occupying the same building.

Floor Area: The sum of the gross horizontal areas of all floors of a building measured from the exterior faces of the exterior walls or from the center line of walls, but not including cellar or basement space not used for retailing.

Garage, Private: A building used only for the housing of motor vehicles, without their equipment for operation, repair or hire or sale.

Home Occupation: Any business conducted primarily within a dwelling unit, an enclosed garage or accessory building and carried on by the inhabitants, which use is clearly incidental and secondary to the use of the dwelling for dwelling purposes and does not change the character thereof.

Lot: A parcel of real property as shown with a separate and distinct number or letter on a plat recorded in the San Miguel County Court House.

Lot Line, Front: The property line dividing the lot from the street.

Lot Line, Rear: The line opposite the front line.

Lot Area: The total horizontal area within the lot lines of a lot.

Mobile Homes: Any vehicle or similar portable structure originally intended to have no foundation other than wheels, jacks or post, and so designed to permit occupancy as living or sleeping quarters.

Non-Conforming Buildings: A building or structure or portion thereof conflicting with the provisions of this ordinance applicable to the zone in which it is situated.

201.22 Natural Materials: Stone, wood, or stained wood.

201.23 Occupied: The word "occupied" includes arranged, designed, built, altered, converted, rented or leased, or intended to be occupied.

201.24 Open-use Recreation Site: Land devoted to the public for recreation, including such facilities as playgrounds and ball-fields, golf, tennis and similar sport installation.

201.25 Recreation Club: A building devoted to public use including such facilities as golf club house, swimming pool club house, tennis club house, playground and play-field activity centers, or club houses, and may include kitchen facilities, assembly hall, meeting rooms, locker facilities, etc.

201.26 Sign: Any device fixed to, painted on or incorporated in the building surface, or displayed from or with a building or structure, or free standing upon the site and which is visible from the public right-of-way; designed to convey or direct a message to the public concerning the identification of the premises or to advertise or promote the interests of any private or public firm, person or organization.

201.27 Street: A public way other than an alley, which affords the principal means of access to abutting property.

201.28 Structure: Anything constructed or erected, which requires location on the ground or attached to something having location on the ground, but not including fences or walls and fences less than six feet (6) in height.

201.29 Use: The purpose for which land or a building is designated, arranged, or intended, or for which it either is or may be occupied or maintained.

201.30 Yard: A space on the same lot with a principal building, unoccupied, and unobstructed by buildings or structures on the ground upward, except as otherwise provided herein.

201.31 Yard, Front: A yard extending the full width of the lot or parcel, the depth of which is measured in the least horizontal distance between the front lot line and the nearest wall of the principal building; such distance being referred to as the front yard setback.

201.32 Yard, Rear: A yard extending the full width of the lot or parcel, the depth of which is measured in the least horizontal distance between the rear lot line and the nearest wall of the principal building; such depth being referred to as the rear yard setback.

Side: A yard extending from the front yard to the rear yard, the width of which is measured in the least horizontal distance between the side lot line and the nearest wall of the principal building.

Service: Any yard area used for storage of materials accessory to or used in conjunction with the principal use of the lot or building, or used for garbage or trash containers, or for the location of mechanical equipment accessory to the principal building or use.

Utilities: All poles, lines, cables or other transmission or distribution facilities of public utilities.

Article III GENERAL PROVISIONS

Section 301. Zoning Districts

For the purposes of this Ordinance, the Town of Ophir, Colorado is hereby divided into three Zoning Districts to be known as follows:

Residential District
Avalanche Hazard District
Open Space District

Section 302. Zoning Map

The boundaries of these districts are shown on the Official Zoning Map of the Town of Ophir which accompanies and is made a part of this Ordinance.

Section 303. General Requirements.

1. No building shall be erected, converted, enlarged or structurally altered, nor shall any building or premises be used for any purpose other than permitted in the district in which such building or premises is located. No building shall be erected, enlarged, moved or structurally altered except in conformity with the height, yard or other regulations prescribed herein for the district in which the building is located; every part of a required yard shall be open to the sky, unobstructed, except as hereafter provided; no yard of any lot shall be reduced to less than to be smaller than the applicable district requirement.

2. Every building hereinafter erected or structurally altered shall be located on a lot as defined in Section 201, and in no case shall more than one residential building be located on a lot.

All buildings shall have natural materials as exterior materials.

Article IV Residential District

Section 401. Use Regulations

Intention: To allow utilization of land for residential purposes and customary accessory uses. Recreational and institutional uses customarily found in the proximity with residential uses are included.

Section 402. Uses Permitted

1. One-Family Dwellings, accessory buildings and use, home occupations.
2. Fences, hedges or walls, subject to supplementary regulations.

Section 403.

Any other uses must be approved by the Town of Ophir through the Special Use Permit (SUP) process. A Zoning commission will be appointed by the General Assembly upon the

of an application for a SUP, and that commission will act upon the application in the manner described in Section 403-1, below.

Procedure for Special Use Permits

- a. Application for a SUP shall be submitted to the General Assembly at its regular meeting. An application shall be obtained from the Town Clerk of Ophir.
- b. At that same meeting, the General Assembly shall appoint a Zoning Commission of at least 5 qualified electors who shall study and review the Application and accompanying evidence, and shall prepare a report to the General Assembly recommending that the SUP be either approved, disapproved or approved with modifications on conditions attached.
- c. The General Assembly shall rule on the application as follows:
 1. A public hearing on the application shall be held as indicated in Section 403-2, below, and such permit may be granted or denied, or granted with modifications on conditions attached.
 2. The General Assembly shall act upon the Application within 30 days of the public hearing, or such longer period as may have been agreed upon by the applicant.
 3. The SUP must be used only by the Applicant and can not be transferred, and expires after one year unless it is used.

- d. Before granting a SUP, the General Assembly shall hold a public hearing on the matter, and notice of such hearing shall be published one time at the expense of the applicant in a newspaper of general circulation within the Town of Ophir at least 14 days prior to the hearing date. In addition, written notice of the hearing shall be mailed to the applicant and to all adjacent property owners to the project at least 14 days prior to the hearing date.

Section 404. Uses Not Permitted

1. Industrial Uses, including but not limited to lumber and ore mills, mines, quarries, sand and gravel operations tailings storage areas and adjacent industrial buildings.
2. Mobile Homes

Section 405. Minimum lot area per dwelling.

1. 5000 square feet per single family dwelling
2. 10,000 square feet per 2 family dwelling (must first be given a SUP)

Section 406. Minimum Front Yard

1. Buildings.....10 feet
2. Corner lots (both streets)10 feet - front, 5 feet - sides

Section 407 . Minimum Rear Yard

All buildings.....10 feet

Section 408. Minimum Side Yard

All buildings.....5 feet

Section 409. Minimum Roof Pitch

All buildings.....1 to 4

Section 410. Maximum Building Height

All buildings....25 feet

Article V

Open Space District

Section 501. Intent and Purpose

To insure that land intended for open space use is retained and developed in such a manner that the land retains its natural character and intended use.

Section 502. Limitations of Zone District

This Zone shall include only land which has been dedicated to or is owned by the Town of Ophir, unless specifically requested by a property owner within the Town of Ophir.

Section 503. Uses Permitted

Open space recreation uses which shall include the retention of land in its natural state and uses which are compatible with the natural environment, including but not limited to walking and hiking trails, nature trails and natural areas. Also, certain areas of the open space district can be fenced in order to protect certain natural features, provided that approval is obtained from the General Assembly and the height of the fence does not exceed 48 inches. There is also created a riverfront open space district subject to the same uses.

Section 504.

All other uses, including horse pasture, fences, roads and vehicular access, and pedestrian bridges over the river shall be subject to the Special Use Permit process.

Section 505. Uses not permitted

Organized recreation uses, including but not limited to playfields, campgrounds, courts, permanent buildings or other similar uses.

Article VI

Avalanche Hazard Zone

Section 601. Intention

To define areas where avalanches may pass over the ground and to restrict building in those areas.

Section 602. Uses Permitted

Open Space Recreation only.

Section 603. Map Adopted.

The Town of Ophir has adopted a Avalanche Zone as indicated by the attached map. It is the intention of the Town of Ophir to allow building of residences on building sites which have at least 50% of their area outside of the designated avalanche hazard zone.

Article VII

Supplementary Regulations

Utilities: Nothing in these regulations shall be construed to prevent the construction of a public utility or utility structure necessary for the transmission or commodities or services of a utility company including mains, transmission and distribution lines, provided that all mains, transmission and distribution lines are completely buried beneath the surface of the ground. All construction and improvement of utility lines and structures are subject to the Special Use Permit process.

Article VIII Administration and Enforcement

Section 801 Administration

1. Enforcing Official: The provisions of this Ordinance shall be enforced and administered by the Building Inspector of the Town of Ophir, his authorized representative, or such other authority as appointed by the General Assembly of the Town of Ophir.
2. Right to Trespass: The Building Inspector or any duly authorized person shall have the right to enter upon any premises at any reasonable time for the purpose of making inspections of buildings or premises necessary to carry out his duties for the enforcement of this Ordinance.
3. Liability: The Building Inspector or any employee charged with the enforcement of this code, acting in good faith and without malice for the Town in the discharge of his duties, shall not thereby render himself liable personally and is hereby relieved of all personal liability for any damage which may accrue to persons or property as a result of any act required or by reason of any act or omission in the discharge of his duties. Any suit brought against the building department shall be defended by the Town of Ophir.
4. Stop Orders: Whenever any building work is being done contrary to the provisions of this Ordinance, the Building Inspector may order the work stopped by notice in writing served on any such person engaged in doing or causing such work to be done. Any such person shall forthwith stop such work until authorized by the Building Inspector to resume work.
5. Building Permit Required: It shall be unlawful to commence the excavation for or the construction of any building or any other structure, including accessory structures until the Building Inspector of the Town of Ophir has issued a building permit for such work.
6. Application for Permit: Application for a building permit shall be made to the Building Inspector of the Town on forms provided for that purpose.
7. Requirements for Permits: The Building Inspector of the Town shall require that every application for a building permit shall be accompanied by 2 copies of a plan drawn to scale and 3 elevation drawings and showing the following in sufficient detail to enable the Building Inspector to ascertain whether the proposed excavation, construction, reconstruction or conversion, moving or alteration is in conformance with this Ordinance. All building permits expire after one year if the Building Inspector determines that insufficient progress has been made.
 - a. Lot dimensions and corners: The actual shape, proportion and dimensions of the lot to be built on, and satisfactory evidence that actual corners of the lot are known and are established on the ground.
 - b. Proposed Structures: The shape, size and location of all buildings, fences, other structures to be erected, altered or moved and of any buildings, fences or other structures already on the lot.
 - c. Use of Structures: The existing and intended uses of the building and other structures.
 - d. Existing Yards: The dimensions of all yards and such other information concerning the lot or adjoining lots as may be essential for determining whether the provisions of this Ordinance are being observed regarding yards, areas, and other such requirements or standards.
 - e. Building Code: Any other information as required by the Uniform Building Code.
 - f. Any planned roads or access.
8. Issuance of Permit: If the proposed excavation, construction, moving or alteration is set forth in the application is in conformity with the provisions of this Ordinance and all other Ordinances of the Town, the Building Inspector shall issue a Building Permit.
9. Disapproval of Permit: If an application for a building permit is not approved,

the Building Inspector shall state in writing his reason for such a disapproval.

11. Null and Void Permits: Any permit issued in conflict with the provisions of this Ordinance shall be null and void and may not be construed as waiving any provision of this Ordinance.

12. Certificate of Occupancy Required: After the effective date of this Ordinance no change in the use or occupancy of land, nor any change of use or occupancy in an existing building other than for single family residence shall be made, nor shall any new building be occupied for any purpose other than single family residence use until a certificate of occupancy has been issued by the Building Inspector of the Town of Ophir.

13. Record kept by the Building Inspector: A record of all certificates of occupancy shall be kept on file in the office of the Building Inspector, and copies shall be furnished on request to an at the expense of any person having a proprietary interest in the land or building affected by such certificate of occupancy.

14. Appeal from decisions: The applicant may appeal to the General Assembly of the Town of Ophir in the following manner. The aggrieved applicant must file notice of appeal with the Town Clerk of Ophir within 30 days of the mailing of the written order of the Building Inspector. The Town Clerk shall place the appeal on the agenda of the next Town Meeting. The General Assembly shall consider the recommendations of the Building Inspector and the arguments of the aggrieved applicant, and shall, within 30 days of the filing of said appeal, either confirm or overrule the decision of the Building Inspector.

Article IX Amendments

Section 901. Procedure

1. Amendments, supplements, changes or repeals of this Ordinance or any article thereof, or to the official zoning map may be initiated by application of:
 - a. Any qualified elector of the Town of Ophir or any property owner within the Town of Ophir.
 - b. The Town of Ophir, by and through its staff or elected officials.
2. Application for an amendment to this Ordinance shall be filed with the Town Clerk of Ophir, and shall contain the following information:
 - a. Description of the land to be rezoned, and requested new classification, along with a sketch to scale showing boundaries of area requested to be rezoned, along with an indication of the existing zoning on all sides of the area.
 - b. A statement of justification for the rezoning, including one of the following conditions: Changing area conditions, conformance to master plan for the area, or peculiar suitability of the site to a certain use.
 - c. Description and sketches, if available, of buildings or uses within 200 feet of the proposed area of change, in all directions.
 - d. Time schedule for any contemplated new construction.
 - e. Justification for any business or industrial use.
 - f. Effect that the zoning would have on adjacent uses.

Section 902

All applications for changes to the Zoning Ordinance or map shall be referred by the Town Clerk to the General Assembly, who shall decide either for or against the change at its next meeting, unless it is determined that additional information is needed from the applicant.

Section 903

Before any amendment to this Ordinance or map is enacted, a public hearing shall be

held in the manner described in Section 902. Notice of the Public hearing shall be published at least 14 days prior to the date of the hearing and written notice shall be mailed to owners of land within 100 feet of the proposed change in Zoning, at least 14 days prior to the hearing date. Cost of such notice shall be borne by the applicant.

Section 904: Penalty

Violation of any article, section or subsection of this Ordinance is hereby deemed to be a misdemeanor and any person found guilty hereunder shall be fined not less than \$5.00 nor more than \$300 or sentenced to jail for a term of not less than 1 day or not more than 90 days or by both such fine and sentence. Every day this Ordinance is violated shall constitute a separate offense.

Section 905: Complaints

Any person aggrieved by violation or apparent violation of this Ordinance shall file a written complaint with the Building Inspector, who shall immediately investigate such complaint and take legal action to have the violation penalized and removed if such a violation is found to exist.

Section 906 Interpretation and Validity

The provisions of this Ordinance shall be interpreted and applied to be the minimum required for the proper protection of the public health and safety and welfare of the residents of the Town of Ophir.

Section 907 Conflict

Whenever these regulations are in conflict with any other lawfully adopted regulations, rules or Ordinances, the most restrictive shall apply.

Section 908 Severability

If any part or parts of this Ordinance or any article thereof are for any reason to be held invalid or unconstitutional, such decision shall not affect the validity or constitutionality or the enforceability of the remaining portions of this Ordinance.

Section 909 Adoption of Building Code.

The Town of Ophir has adopted the Uniform Building Code.

Section 1000 Fees

No permit as required by the Building Code shall be issued until the fee prescribed by the Town of Ophir has been paid.

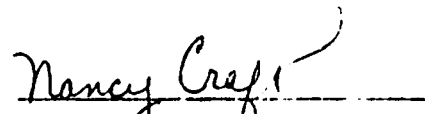
The Town shall adopt fees for administration of the Special Use Permit process.

This ordinance replaces and supercedes any previous zoning legislation passed by the Town of Ophir. This ordinance shall take effect 30 days after passage by the Ophir General Assembly

INTRODUCED, READ, PASSED AND ADOPTED BY THE GENERAL ASSEMBLY OF THE TOWN OF OPHIR ON THIS 23rd Day of March, 1980 at a regular meeting of the Town of Ophir, State of Colorado.


MAYOR

ATTEST: I certify that the above Ordinance No. 80-1 was introduced to the General Assembly on January 27, 1980, with a Public Hearing being held on that same date; a first reading of the above ordinance No. 80-1 was held on February 24, 1980; and a second and final reading was held on March 23, 1980.


TOWN CLERK

ORDINANCE No. 2007-5
AMENDMENT OF THE OPHIR LAND USE CODE
REGARDING EXISTING STRUCTURES IN THE AVALANCHE HAZARD ZONE DISTRICT

WHEREAS, the Ophir General Assembly met on July 17th, 2007, and agreed to consider amendment of the Ophir Land Use Code pertaining to grandfathered non-conforming structures in the Avalanche Hazard Zone District; and

WHEREAS, the Ophir Planning Commission met on September 11th, 2007 and November 13th, 2007, and after conducting a public hearing following mailing and posting notice of such hearing in accordance with §1405 of the Ophir Land Use Code and considering all comments at such hearing, moved to recommend amendments to the Ophir Land Use Code pertaining to non-conforming structures in the Avalanche Hazard Zone District; and

WHEREAS, the General Assembly conducted public hearings on such Planning Commission recommendations on the 20th day of November, 2007, and the 18th day of December, 2007, after publishing and posting notice of such hearings 10 days in advance, and considered all comments at such hearing in accordance with §1405 of the Ophir Land Use Code; and

WHEREAS, the General Assembly finds that these amendments to Avalanche Hazard Zone District-related regulations will streamline the Special Use Permit review process for the replacement, relocation, renovation or expansion of existing grandfathered single-family residential structures and the old Town jail; that elimination of mandatory requirements for construction mitigation of such structures will facilitate the reasonable use of land by owners and residents of existing grandfathered single-family residential structures and the old Town jail, provided that the owners thereof acknowledge and assume the risk of construction and occupancy in the Avalanche Hazard Zone District and agree to release and indemnify the Town against possible liability in connection therewith, and will potentially minimize cost to existing owners and residents of such structures for their replacement, relocation, renovation or expansion, and that passage of this Ordinance will promote the affordability of housing within the Town of Ophir and promote the health, safety and general welfare of the Ophir community, improve the administration of the Ophir Land Use Code, and promote the purposes of the Ophir Master Plan sections 2.2 and 2.7; and

WHEREAS, passage of this Ordinance is not intended to create any precedent for approval of new construction or development on vacant lots within the Avalanche Hazard Zone District, insofar as no avalanche hazard risk to any structures or occupants exists with regard to vacant lots, and any construction or development-related risk with respect to replacement, relocation, renovation or expansion of existing grandfathered structures in the Avalanche Hazard Zone District is, at most, incremental.

NOW, THEREFORE, BE IT ORDAINED BY THE GENERAL ASSEMBLY OF THE TOWN OF OPHIR:

SECTION 1. AMENDMENTS. The following described Ophir Land Use Code provisions are hereby amended as follows:

§307.1 is hereby amended by addition of a new subparagraph D.

§307.1.D. A grandfathered single-family dwelling or accessory building in the Avalanche Hazard Zone District which has received a Variance or Special Use Permit for its replacement, relocation, renovation, or expansion shall not be considered to be non-conforming.

§307.2 is hereby revised and re-enacted as follows:

“§307.2 Expansion. Non-conforming uses or buildings shall not be allowed to increase the non-conforming use or change, renovate, relocate or expand the non-conforming building without approval by the General Assembly through the Variance or Special Use Permit (SUP) process. In the case of proposed replacement, relocation, renovation or expansion of a grandfathered single-family dwelling or accessory building in the Avalanche Hazard Zone, however, the Variance or SUP application shall require only a single hearing by the Planning and Zoning Commission and by General Assembly and may be approved by Resolution of the General Assembly if consistent with the standards and requirements of LUC **§803**. Amendments to any approved SUP or Variance for the replacement, relocation, renovation or expansion of a single family dwelling or accessory building in the Avalanche Hazard Zone may be approved by the Town Administrator subject to the standards and requirements of **§803**, or in his or her discretion, may be referred to the Commission and General Assembly. A grand-fathered single family dwelling in the Avalanche Hazard Overlay Zone means those single family dwellings, together with accessory buildings existing prior to the adoption of the Ophir Zoning Ordinance No. 1 in 1979, located on Lots 1 through 6, Block 24, and those single family dwellings, together with accessory buildings existing prior to the adoption of the Ophir Ordinance 2005-5 Adopting the Town of Ophir Land Use Code in 2005 located on Lots 15 through 17 and 18 through 20, Block Q; Lots 9 through 10, 11 through 12 and 13 through 15, Block M; Lots 9 through 10, 13 through 14 and 15 through 16, Block B, and additional existing single family dwellings and accessory buildings that become included in the Avalanche Hazard Overlay zone district due to future amendments to the Avalanche Hazard Overlay Zone District Map.

§ 801 is hereby revised and reenacted as follows:

“§801. INTENTION AND PURPOSE. The Avalanche Hazard Zone is intended to define areas where avalanche hazard threatens the health, safety and welfare of persons and property, and to restrict development in those areas other than (a) the replacement, relocation, renovation or expansion of existing grand-fathered single family dwellings and accessory buildings in accordance with standards and procedures of the provisions of **§307.2** and **§803**; and (b) the replacement, renovation or expansion of the old jail building located on Lots 9 and 10, Block T. The Avalanche Hazard Zone boundaries are established on the official Hazards Overlay Map of the Town of Ophir.

§ 803 is hereby revised and reenacted as follows:

§803. USES PERMITTED ON REVIEW - REQUIREMENTS.

Any construction or development activity in the Avalanche Hazard Zone must, in addition to the owner obtaining a Variance or Special Use Permit, meet the following requirements:

§803.1 Prior to issuance of a building permit, the property owner, on behalf of itself and its successors-in-interest, must agree to indemnify and hold harmless and release the Town of Ophir, its officials, employees, attorneys, insurers and authorized agents, from and against any and all damages, costs, expenses, losses, claims, or liability asserted by any person for damage or destruction to property, injury or death arising out of or resulting directly or indirectly from (a) the construction, development, use or occupancy of a single family dwelling and/or accessory buildings in the Avalanche Hazard Zone; and (b) the approval or permitting of such construction, development, use or occupancy by the Town of Ophir and its officials, employees and authorized agents. The indemnity and release shall acknowledge that the property owner assumes all risk of danger by reason of construction, development, use or occupancy of the structure(s), and shall be in a form approved by the Town Administrator, shall run with the land, shall be binding upon the property-owner's successors-in-interest, and shall be recorded in the records of the San Miguel County Clerk and Recorder. The property owner and its successors-in-interest shall keep and maintain in effect at all times a general liability insurance policy, if available. Notwithstanding anything else in the Land Use Code to the contrary, in the event that the property owner or its successors-in-interest fail to fully indemnify and hold harmless the Town in accordance with this section 803.1, the Town Administrator or Land Use Code Enforcement Official shall be authorized to revoke

the Certificate(s) of Occupancy for any structure(s) or improvement(s) on the subject property and to withhold building permits until such time as full indemnification has occurred.

§803.2 No structures or accessory buildings, other than replacement, relocation, renovation or expansion of a grandfathered single-family dwelling or accessory building, or the old jail building located on Lots 9 and 10, Block T, as may be approved pursuant to a Variance or the Special Use Permit process in accordance with the standards and requirements of **§803**, shall be permitted in areas designated on the Hazards Overlay Map as High or Moderate Avalanche Hazard.

§803.3 The provisions of this **§803** shall be administered by the Town Administrator or his/her designee. All certificates and indemnification agreements shall be submitted in a form reasonably acceptable to the Town Administrator.

§ 804 is hereby revised and reenacted as follows:

§804. AVALANCHE HAZARD ZONE ADOPTED;

DISCLAIMER. The Town of Ophir has adopted a Hazards Overlay Map, which designates areas of High Avalanche Hazard and Moderate Avalanche Hazard. This designation is based on scientific and engineering considerations, which are inherently limited by available data and scientific assumptions used at the time of designation. Compliance with the provisions of **§803** cannot ensure freedom from risk to life, safety or property. Approval of a Variance or Special Use Permit for the replacement, relocation, renovation or expansion of a single family dwelling or accessory building in the Avalanche Hazard Zone shall not create liability on the part of the Town of Ophir nor any officer or employee or consultant thereof for any injury, death or damage to persons or property that may result from such approval or reliance on any provision of this Code or the Hazards Overlay Map. The designation of certain areas as hazard areas, high hazard areas, or moderate hazard areas does not imply in any way that areas not so designated are free from risk or have less risk to life, safety or property.

SECTION 2. PUBLICATION. After final adoption, a public notice shall be published which notice shall contain the number and title of this ordinance, a brief description of the ordinance, its effective date and a notice that copies of the ordinance are available for inspection at the Town Clerk's office.

SECTION 3. SEVERABILITY:

If any one or more sections or parts of this Ordinance or the Town of Ophir Land Use Code is adjudged unenforceable or invalid by a court of competent jurisdiction, such judgment shall not affect, impair, or invalidate the remaining provisions of this Ordinance or Town of Ophir Land Use Code, the intention being that the various provisions herein are severable.

SECTION 4: EFFECTIVE DATE:

This Ordinance shall take effect immediately upon final adoption.

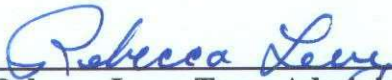
Introduced, Read, Amended and Approved on First Reading by the General Assembly on the 20th day of November, 2007.

Approved and Adopted As Amended on Second and Final Reading by the General Assembly of the Town of Ophir on the 18th day of December, 2007.


By: _____


Randy Barnes, Mayor

Attest: _____


Rebecca Levy, Town Administrator

Approved as to Form:



Town Attorney

Ophir Clerk

From: Steve Johnson
Sent: Wednesday, February 13, 2019 1:33 PM
To: 'Ken Haynes, Town of Ophir'
Cc: Corinne Platt (mayor@town-ophir.co.gov); 'Amy Ward'; 'Joe'
Subject: RE: High Hazard Avalanche Zone
Attachments: 071115 Avalanche Study for Cornwall property.pdf; Schultz, Development and Liability in the Ophir Valley.htm; Richert Avalanche Study_3-04-2015 (1).pdf

Ken – I suggest you review these documents, LUC article 8, and the LUC article 14 map amendment procedures (I'll need to refresh), then call me.

According to Mr. Waller, the updated Wilbur study will show parts of some lots as completely outside of high zone, and some lots or parts of lots outside of the moderate hazard zone.

I think they (Cornwall /Whitaker) are looking at both map amendment, from high hazard to moderate or in some cases to no hazard (hazard zone exclusion), and possibly rezone of underlying zoning if that is not residential (should have been open space as per my 2004 letter to Cornwall).

If parts of lots 1-10, Block 2 are mappable outside of any hazard zone, then they may also want to subdivide (replat) to create new lots with adequate square footage, etc.

If all of that is approved, to build actual structures, they will also need special use permits.

We have the further issue of whether any new construction can be approved in the moderate zone, and whether construction can occur on a lot that is partially within the moderate zone (outside of the zone).

I believe our current interpretation is that only reconstruction of existing grandfathered structures is allowed in the moderate zone, although an exception was erroneously made once (2015, Richert/Sloan). We don't want to advertise that fact.

A recent would-be-purchaser of lots in the moderate zone, Gerdt, was told within the last year no new construction is allowed there.

Apparently Wilbur, who used to work with Mears, is the only avvy hazard consultant in the state, if Mr. Waller is correct.

If so, we will probably need to reach out to Colorado Geologic Survey or look for Utah consultants to obtain some independent review of their updated report.

Regards, Steve

Stephen B. Johnson Law Firm, P.C.
155 Trunk Rd.
Placerville, CO 81430 (courier only)
PO Box 726
Telluride, CO 81435 (US mail only)
Tel. No. 970-728-5301
steve@8750law.com
<http://telluridecolawyer.com>

From: Ken Haynes, Town of Ophir [mailto:admin@town-ophir.co.gov]
Sent: Wednesday, February 13, 2019 9:06 AM
To: Steve Johnson <steve@8750law.com>
Subject: High Hazard Avalanche Zone

Good Day Steve,

We are getting some inquiries regarding building in the avalanche hazard zone. Specifically at this point Block 2, which is clearly within the high hazard zone. I joined P&Z in this discussion last night and would like your guidance on how to direct the individuals for this potential project and others moving forward.

Thank you,

Ken Haynes, Town Manager
Town of Ophir
PO Box 683
Ophir, CO 81426
970-728-4943

Development and Liability in the Ophir Valley, Colorado

Joseph Shults

Telluride Ski Patrol, P.O. Box 720, Ophir, CO 81426; tel. 970-728-2939; email. ppt@rmi.com

Ophir, Colorado, a small mining town located 8 miles from Telluride, Colorado, was heavily damaged by avalanches in the early 1900s. By the 1960s it was nearly a ghost town, but currently it is experiencing a revival. Much of the town and the 3 mile road up the valley lie directly in avalanche paths, making it one of the most threatened, habited valleys in North America. The dense concentration of large avalanche paths in combination with high land values make the Ophir valley an ideal case to study some of the social and legal questions associated with land development in and near areas threatened by avalanches. Some of the issues to be discussed include: What are the responsibilities of developers to disclose the hazards and possible costs of mitigation? Who pays for mitigation if there is any? What are the rights and responsibilities of land owners who own portions of a path? And, of course, who pays if things go wrong? Information has been gathered from local legal advisors, residents, and local avalanche professionals.

Keywords: Liability, avalanche, zoning, mitigation

1. INTRODUCTION

Throughout the 70, 80's and 90's people have been flocking to the mountains throughout the West. Some just visit but many others have remained and made it their home, with areas surrounding or near ski resorts seeing exponential growth. In South West Colorado's historic mining areas there has been a rebirth of several small mining towns and an interest in land development on existing mining claims. Associated with this has been skyrocketing land values for one but also the associated avalanche hazards and legal questions.

2. HISTORY

The town of Ophir is located

approximately five miles south of Telluride, Colorado in the San Juan Mountains. It sits at an elevation of 9,600-9,800 feet and is hemmed in by 13,000 plus feet peaks on the North and South sides. This in combination with the infamously unpredictable, Continental snow pack of the San Juans, makes it a somewhat hazardous location to reside in occasionally during the winter months.

First, a brief history of the valley. The area was discovered to be rich in minerals in 1875 and by 1881 it was an incorporated town. The population fluctuated through boom and bust cycles but in 1885 Ophir had a population of 200 people and by 1891 the population had grown to 400 people and 70 houses.

Winter storms isolated the town for weeks at a time and produced large avalanches which destroyed many, many, mine buildings, a portion of the town itself, and killed numerous miners and residents.

By 1910 people were leaving Ophir as mines closed down. Silver and other metal prices dropped in the early twenties and Ophir's population continued to shrink. By the early 50's Ophir's population was down to two residents, and by 1970 there was only one full time resident. But in 1972 the Telluride Ski resort opened and the population has rose steadily since to a present level of about 130 residents.

In 1973 Art Mears was contracted by the State of Colorado to complete a study and produce a hazard evaluation map for the valley from the town of Ophir down to the Ophir loop. What this map shows is that roughly 70% of the three mile road into Ophir can be reached by avalanches with return periods of 10 to 50 years

and several other paths reaching the road quite regularly. Also above the town itself two very

large paths could potentially affect a large portion of the platted town. Although these paths run less frequently (four large cycles have been noted in the last 80 years) they present a greater hazard due to the exposure time of the residents.

Since this map is based on very little historical data and Voellmys equations, Art clearly states that it has its' limitations and possible inaccuracies, but the lines which he drew have become very clear-cut and definitive. With the value of 50 x 100' lots now approaching \$100,000 people want to know if they are in the avalanche path or not. More recently people have been purchasing mining claims throughout the valley and once again the lines which Art drew 25 years ago can have a significant affect upon the land value of a particular parcel.

3. SO WHAT DEVELOPEMENT DO WE CURRENTLY HAVE WITHIN THE DELINEATED HAZARD ZONES?

Up to this point there has been no construction of new homes, but extensive renovation of existing homes has occurred along with the construction of new homes right up to the hazard zone lines.

4. DO PEOPLE HAVE THE RIGHT TO BUILD IN A KNOWN PATH?

At this time regulation 1041 does allow new construction within an avalanche path if no safe area can be located on the parcel, but the

building must be engineered to withstand the expected impact pressures, along with no commercial use in the winter, and several other restrictions.

5. WHAT IS THE CURRENT CONTROL PROGRAM?

San Miquel County took control of the road in 1942, but since the population was almost zero no real control program was initiated. Sometime in the 1970's they started to bring in some guns from the state, generally in the spring, and did some sporadic control work over the road, but not over the town itself due to liability. Sometime during this period a round caused a release of the entire North side of the valley at once, thus showing that control of the road and town were occasionally the same.

In 1984, Helitrax helisking was started by Mike Friedman and several other locals. This gave the county a new option. Currently Mike Horner, the County Superintendent, along with Helitrax decided when to implement control work.

Since at this time there is no actual forecaster for the area, the closure of the road itself only occurs when control work is actually in progress. Although no one has actually been buried yet there are stories of close calls and hair raising adventures.

6. SO WHAT IS THE LIABILITY ISSUE?

Up until 1998 the county and Helitrax were doing this control work without liability insurance. In 1998 Helitrax decided not to continue to do work for the county unless they were indemnified. Both the county and town of Ophir attorneys felt that since Helitrax was a subcontractor they were not covered under the government immunity laws. Getting this coverage took some time but since no houses were actually in the mapped runouts of the paths getting controlled there were able to secure a policy.

Acquisition of this policy was down to the wire with the largest storm cycle of the winter, and at one point due to the delay, the school bus ceased to travel the road. Along with this policy, signed waivers were acquired from the owners of the two existing homes most threatened by control of the road were acquired.

During this time there was talk of trying to acquire waivers from all of the land owners in Ophir, so that control over the town could be done, but initial attempts at this proved difficult.

7. LEGAL QUESTIONS:

7.1 SO WHAT ARE THE RIGHTS OF PRIVATE LAND OWNERS AS FAR AS CONTROL WORK ON PRIVATE LANDS?

This appears to be an untried area. Can a land owner prevent explosives from being used on his/her property? The general response I received was yes, unless a case was made that a public emergency existed, then a court order could be retained. But most of the starting zones, in Ophir at least, are large enough that no one land owner has control over the entire starting zone.

7.2 CAN A PRIVATE LAND OWNER PREVENT SLIDES FROM BEING RUN OVER THEIR PROPERTY?

Another gray area, but generally it was felt if you were in no way depriving that landowner of the economic benefit of that property it was probably acceptable for the public welfare. You could possibly be liable for damage to timber if it was shown to have economic value and certainly to any structure on the property.

7.3 WHAT RESPONSIBILITIES DO DEVELOPERS OR REAL ESTATE AGENTS HAVE TO REVEAL THE HAZARDS?

As you might imagine they are responsible to disclose any geologic hazard to the property that they know of and is on public record. As far as the road hazards go, things were not so clear. Although every realtor I spoke with said that they did disclose the road hazards, not all of them believed, since it did not directly effect the property that it was required.

7.4 HOW ABOUT A PRIVATE SELLER?

No one knew of a case where a private seller was actually found liable for not disclosing hazards on a property.

7.5 SO WHAT IS THE OPHIR COMMUNITY FEELING ON ALL THIS?

Like most small communities, the people of Ophir want to have control of their own destiny, generally they are willing to accept the risks that come along with living in a high mountain valley. But what risk is acceptable? Will peoples perception of acceptable risk change after an accident?

8. WHAT IS IN THE FUTURE?

Well, the control work over the road seems to be mostly solved for the moment, although some type of local forecasting should probably be initiated so the road closures are more effective and timely.

As for the control work with explosives this would probably not be acceptable due to the unpredictability of avalanches. Most feel that defense structures in the runouts are probably the most effective option. But due to the very limited financial resources of the town I do not foresee anything along these lines in the near future. Also, even when these proposals have been mentioned some residents object on the grounds that it would make the town have a safer feeling and thus increase the rate of development.

9. WHAT DOES ALL THIS MEAN TO YOU AS AN AVALANCHE PROFESSIONAL?

I believe that these remote high mountain properties are going to continue to see ever increasing development in the future and thus a need for more study, delineation, and mapping of avalanche hazard areas. Those of you who do take on this consultation work are going to have to be sure to have a complete understanding of the procedures currently in use for the detailed evaluation of avalanche hazard areas and methods for quantifying risks, design parameters, mitigation procedures, and legal implications.

Keep in mind that that cold North facing hillside property might not look like much today but it could be the home of the rich and famous tomorrow

10. REFERENCES

Collman, R., McCoy, D. A., and Graves, A., 1993: The R.G.S. Story, Volume III, 13-493.

Mears, A.I., 1975: Snow Avalanche Hazards Of The Ophir Area, San Miquel County, Colorado. Open File Report, 1-13.



May 19, 2009

David T. Cornwall
Joyce A. Whitaker
2186 Brittany Colony Dr.
League City, TX. 77573

Dear Mr. Cornwall and Mrs. Whitaker,

I am writing in response to your letter dated May 1, 2009 to Ophir Town Clerk Rhonda Claridge re Cornwall Property Block 2, Lots 1 – 10 and accompanying Land Use Code (LUC) Amendment application seeking to rezone the same as “buildable lots in a moderate/blue hazarde zone area.” It is understood that these ten lots currently fall within the Town’s high hazard avalanche zone district.

As Town Manager, I have undertaken a completeness review of your application, and note that Ophir Land Use Code provides in pertinent part:

§ 1402.2 Application for an amendment to this LUC shall be filed with the Town Clerk of Ophir, and shall contain the following information:

- A.** A legal description of the land to be rezoned, and requested new classification, along with a sketch to scale showing boundaries of the area requested to be rezoned, along with an indication of the existing zoning on all sides of the area.
- B.** A statement of justification for the rezoning, including one of the following conditions: Changed conditions in area, compliance with the Town of Ophir Master Plan for the area, or peculiar suitability of the site to a certain use.
- C.** Description and sketches, if available, of buildings or uses within 200 feet of the proposed area of change, in all directions.
- D.** Time schedule for any contemplated construction.
- E.** Justification for change of use.
- F.** Effect that zoning would have on adjacent uses.

§1403. APPLICATION SUBMITTAL REQUIREMENTS.

§1403.1 Ten (10) copies of a complete application as set forth in Appendix A. Forms: Land Use Code Amendment Application.

Moreover, Appendix A: Form for Land Use Code Amendments requires:

(4) Proof of Ownership by title commitment or attorney opinion.

You inquired as to this proof of ownership requirement in a phone conversation we had regarding your forthcoming application, and after soliciting the opinion of our Town Attorney, I responded via email on April 24, 2009 that you should "provide either a copy of the actual deed to the property or a copy of the current title insurance policy." Unfortunately, the real property tax document you provided does not identify you as owners of record of the property. While you noted that you are in the process of having title transferred to you as a result of certain probate matters, you did not provide proof of ownership by a title commitment or attorney's opinion as required by the LUC and application.

While I am entirely sympathetic to your ownership argument and have no reason to believe that you will not succeed in having title transferred to you, I am not in a position to make any independent determination or opinion of property ownership, nor am I qualified to do so. That is exactly why the title company or attorney opinion documents are instead required.

Accordingly, I have no choice but to find your application to be incomplete and am therefore returning your application fee check in the amount of \$500, together with all ten copies of your application.

In the future, should you choose to resubmit once you are able to establish ownership, please also address the following items in order to have a complete application:

- clarify zone district classification sought;
- include sketch to scale, zoning designation of surrounding properties (not copy of report excerpt);
- include description of uses and buildings if any within 200';
- time schedule;
- address 1402.F. For example, if rezoning to Moderate Avalanche Hazard District occurred and (up to 5) buildings were then built in the rezoned area after receiving a Special Use Permit, please have your engineer address the potential effect of the deflection of snow would have on adjacent uses. This may include, but is not necessarily limited to, the impact to buildings potentially affected by any deflected avalanches and the secondary effects any such residential rezoning may have on snow removal efforts activity in the area.

Should you have any questions, please contact me at your convenience at the Town Hall office.

Sincerely,

Jason S. Wells,
Ophir Town Manager

Cc:

Stephen B. Johnson, Town Attorney
Rhonda Claridge, Town Clerk
Randy Barnes, Mayor of Ophir
Suzanne Beresford, Chairperson, Ophir Planning and Zoning Committee

Stephen B. Johnson Law Firm, P.C.

526 W. Colorado Ave

P.O. BOX 726

TELLURIDE, CO 81435

Telephone: (970) 728-5301 Fax: (970) 728-4271 Email: steve@8750law.com

January 18, 2008

Mr. David Cornwall
Mr. Gary Whittaker
Ms. Joyce Whittaker
2186 Brittany Colony Drive
League City, TX 77573

Re: Response to your Letter to Rebecca [Levy] Dated January 4, 2008
Concerning Lots 1 – 10, Block 2, Ophir, Colorado

Dear Mr. Cornwall, Mr. and Ms. Whittaker:

Ophir Town Administrator Rebecca Levy has referred your above-referenced letter and attached report (“Wilbur Report”) to me for response to you, due to the explicit threat of litigation against Ophir in your letter.

In your letter, you demand that the Town of Ophir “release” your properties from the Avalanche Hazard Overlay Zone “control restrictions”. You request a response within 90 days, and state that you are prepared to take legal action “if necessary”. You allude to a future court proceeding and discuss potential evidence involved.

Your property is currently in the Avalanche Hazard Overlay Zone, High Hazard Area. The underlying Zone District is apparently Residential, although that appears to possibly have been a mistaken designation as virtually all other Avalanche Hazard Overlay Zone properties have Open Space as the underlying zoning. Thus, if your property were to be completely “released” from the Avalanche Hazard Overlay Zone District, it may not currently be subject to any avalanche mitigation requirements, despite your suggestion that mitigation would occur.

The Wilbur Report does not provide any basis for “releasing” your property from the Avalanche Hazard Overlay Zone. Rather, it suggests that the property is incorrectly classified as High Hazard, whereas the property should instead be classified as Blue/Moderate Hazard (which is still a classification *within* the Zone).

If your property were to be rezoned from the High Hazard to the Moderate Hazard Zone, it would then become eligible for consideration for issuance of a Special Use Permit for mitigated residential dwellings.

Issuance of Special Use Permits for construction within the Avalanche Hazard Overlay Zone is discretionary with the General Assembly, and is based on a site-specific design for a particular proposed structure, which mitigates against the identified avalanche forces. The Special Use Permit provisions of the Ophir Land Use Code have recently been amended. Unexecuted copies of Ordinance Nos. 2007-2 and 2007-5 as passed are included for your information and review. These Ordinances are still in the process of execution due to Mayoral change.

In my opinion, the proper way to proceed with your request, which if successful could effectively result in “release” from high hazard avalanche control restrictions, is to formally submit a rezoning request pursuant to Article XIV of the Ophir Land Use Code, requesting redesignation of your properties from High Hazard to Moderate Hazard Area. A copy of Article XIV is available for inspection at www.town-ophir.co.gov. It is quite possible that you would also be asked to apply to redesignate the underlying zoning from Residential to Open Space as part of the review process or as a condition of approval.

A rezoning application requires submittal of ten application copies, a \$500.00 application fee, some additional information referenced in Article XIV (although the Wilbur Report is the main information needed), possibly a map showing the proposed revision to the zoning map, and obligates you to pay the Town’s review fees. Such fees will include legal review fees; fees of any independent avalanche hazard consultant that may be hired by Ophir to review and advise Ophir concerning the rezoning application; and any professional planner fees. The Ophir avalanche hazard consultant would be asked to review the appropriateness of the assumptions, data, methodology, and results of the Wilbur Report. Ophir is currently in the process of retaining an avalanche hazard consultant.

Once a *complete* application has been submitted, a public hearing by the Ophir Planning and Zoning Commission as well as two hearings before the General Assembly would be required in order to properly review and act on the application. The General Assembly can only effect rezoning by adoption of an ordinance, which takes two readings at two separate hearings. Initial hearing scheduling following submittal of a “complete” application would occur at the discretion of the Ophir P&Z Commission, probably after an independent avalanche hazard consultant has been retained and had an opportunity to review your application.

If the proposed rezoning (from High to Moderate) were approved, you or any successor owner would then need to apply for a Special Use Permit (SUP) and obtain an approval for such SUP before any building could occur. SUP applications for building new structures require a similar process to the rezoning and are subject to similar cost obligations and procedures.

It is most unlikely that the hearing process for any rezoning application that you may choose to submit, let alone review of SUP applications, could be completed within 90 days from the date of your letter.

As you know, the Town of Ophir presently has an application pending by Mr. Glenn Pauls to rezone certain of his property out of the Avalanche Hazard Overlay Zone District. That application, and the new Mears Map and study, appear to apply *only* to the Pauls Property, as recognized by Wilbur Engineering. So contrary to your contention, you do not have an opinion from *two* experts that *your* lots are eligible for inclusion in a “buildable” zone. And contrary to the statement in your letter, as noted above, the Wilbur Report does not in any way suggest or support your contention that your properties should be *completely* released from avalanche control restrictions.

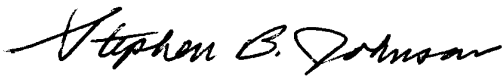
There is a possibility that any application that you may choose to submit could be consolidated for hearing with the Pauls application. That would be a decision for the P&Z Commission to make.

Unless and until you have proceeded through this process and been denied, there is no possible legal injury to your interests, and hence any threat of legal action is both premature and unnecessary.

Please let us know should you choose to proceed with the process that is outlined in this letter.

Sincerely,

STEPHEN B. JOHNSON LAW FIRM, P.C.

A handwritten signature in black ink that reads "Stephen B. Johnson". The signature is written in a cursive, flowing style.

Stephen B. Johnson

Encls.

Rebecca Levy, Ophir Town Administrator

Stephen B. Johnson Law Firm, P.C.

526 W. Colorado Ave.

P.O. BOX 726

TELLURIDE, CO 81435

Telephone: (970) 728-5301 Fax: (970) 728-4271 Email: steve@8750law.com

December 14, 2012

Bo James Nerlin

J. David Reed, P.C.

PO Box 196

Montrose, CO 81402

Via email only: bnerlin@jdreedlaw.com

RE: Cornwall/Whittaker Property

Dear Mr. Nerlin:

This will respond to your email to Randy Barnes dated December 12, 2012 in which you stated "My clients would like an understanding as to why the 2012 application is deficient based on our pre application meeting, and why they cannot submit an application under the 2008 guidelines, or rather, why this application cannot be considered an update of the 2008 application and thus subject to the 2008 rules."

The 2008 application was never made complete. This fact was documented in a letter to David T. Cornwall and Joyce A. Whittaker dated May 19, 2009 by then Ophir Town Manager Jason Wells (copy attached). The application fee was returned to the applicants. The applicants never resubmitted the application to address the incomplete matters, and apparently abandoned the application. Therefore, there is no pending 2008 application, and the provisions of C.R.S. 24-68-102.5 would not entitle your clients to have any such application processed under the "2008 guidelines". Your clients impliedly recognized the absence of a valid, pending application when they requested a pre-application meeting with respect to what you have described as the 2012 application.

Because the "2008 guidelines" were subsequently amended by duly adopted ordinance #2009-4 of the General Assembly, the "2008 guidelines" are no longer legally effective and the current Land Use Code as amended and currently in effect must apply to any re-zoning application which your clients may choose to submit. Please refer to the September 15, 2012 letter to you and Jim Mahoney from Town Manager Randy Barnes, discussing items that would need to be addressed in order for the application to be considered "complete" and eligible for processing. Ophir simply has no valid pending application from your clients.

Should you wish to discuss this matter further with me, please don't hesitate to contact me.

Very Truly Yours,

Stephen B. Johnson Law Firm, P.C.



Stephen B. Johnson

Ophir Clerk

From: Amy Ward
Sent: Monday, June 10, 2019 12:36 PM
To: Steve Johnson
Subject: Fwd: Whitaker Map Amendment Application Packet

Begin forwarded message:

From: "Ken Haynes, Town of Ophir" <admin@town-ophir.co.gov>
Subject: Whitaker Map Amendment Application Packet
Date: June 5, 2019 at 1:44:31 PM MDT
To: "Amy Ward" <amywardski@gmail.com>

Amy,

The Application Packet is to large to share by our current email server.
Please share the link with the Commission and any others request you see fit:

<https://documentcloud.adobe.com/link/track?uri=urn%3Aaaid%3Aasc%3AUS%3Aafb18543-fc3b-4a3d-ac6a-b380cabe5ee6>

I have a copy on CD in the office if Phil can use that. I will also be able to put on a thumb drive or Cd tomorrow.

Also would be able to print the 8.5 x 11 parts here in the office.

Ken Haynes, Town Manager
Town of Ophir
PO Box 683
Ophir, CO 81426
970-728-4943

Ophir Clerk

From: Ken Haynes, Town of Ophir
Sent: Friday, June 14, 2019 3:21 PM
To: Amy Ward
Cc: steve@8750law.com; sydney.roop1@gmail.com
Subject: Re: Town of Ophir 6/18/19 General Assembly Meeting Agenda

As far as page 6 is concerned, the applicant representative, Joe Waller, was not aware that there was a page missing when he received the information from the applicants. He is researching the reason for the deletion and will explain why at the GA.

Ken Haynes, Town Manager
Town of Ophir
PO Box 683
Ophir, CO 81426
970-728-4943

--- amywardski@gmail.com wrote:

From: Amy Ward <amywardski@gmail.com>
To: Steve Johnson <steve@8750law.com>
Cc: "Ken Haynes, Town of Ophir" <admin@town-ophir.co.gov>, sydney.roop1@gmail.com
Subject: Re: Town of Ophir 6/18/19 General Assembly Meeting Agenda
Date: Fri, 14 Jun 2019 14:10:02 -0600

The application did not contain page 6 of the Wilbur study, is that correct Ken? Is this what you were waiting to hear back on?

Amy

On Jun 14, 2019, at 1:32 PM, Steve Johnson <steve@8750law.com> wrote:

OK, I was unclear on the dates...

Still waiting to hear back on the missing page on the Wilbur study.

Stephen B. Johnson Law Firm, P.C.
97 Red Rock Trail
Placerville, CO 81430 (courier only)
PO Box 726
Telluride, CO 81435 (US mail only)
Tel. No. 970-728-5301
steve@8750law.com
<http://telluridecolawyer.com>

From: Ken Haynes, Town of Ophir [mailto:admin@town-ophir.co.gov]
Sent: Friday, June 14, 2019 11:14 AM
To: Steve Johnson <steve@8750law.com>
Cc: sydney.roop1@gmail.com; amywardski@gmail.com
Subject: RE: Town of Ophir 6/18/19 General Assembly Meeting Agenda

The applicant first went to P&Z for a hearing for P&Z to give a recommendation to the GA. The GA will not see this until the July GA at the earliest.

Ken Haynes, Town Manager
Town of Ophir
PO Box 683
Ophir, CO 81426
970-728-4943

--- steve@8750law.com wrote:

From: Steve Johnson <steve@8750law.com>
To: Sydney Roop <sydney.roop1@gmail.com>
Cc: Amy Ward <amywardski@gmail.com>, "Ken Haynes, Town of Ophir" <admin@town-ophir.co.gov>
Subject: RE: Town of Ophir 6/18/19 General Assembly Meeting Agenda
Date: Fri, 14 Jun 2019 10:52:27 -0600

I thought there was going to be a hearing on Cornwall Whittaker rezone application and a follow-up matter:

Public hearing on P&Z recommendation concerning application for rezoning of Lots 1 through 10, Block 2, Town of Ophir, to remove subject property from the Avalanche Hazard Zone designation, maintaining existing Residential zoning.

Agenda language: Consideration of Authorization for Town Mayor and Manager to contract for technical review and comment services from a avalanche hazard mapping consultant or agency win connection with review of the Cornwall-Whittaker rezoning application for Lots 1-10, Block 2, Town of Ophir."

Stephen B. Johnson Law Firm, P.C.
97 Red Rock Trail

Placerville, CO 81430 (courier only)
PO Box 726
Telluride, CO 81435 (US mail only)
Tel. No. 970-728-5301
steve@8750law.com
<http://telluridecolawyer.com>

From: Sydney Roop [mailto:sydney.roop1@gmail.com]

Sent: Friday, June 14, 2019 10:00 AM

Subject: Town of Ophir 6/18/19 General Assembly Meeting Agenda

Good morning Ophirians!

Please find attached the agenda for next week's general assembly meeting. We hope to see you there!

Best,

Sydney Roop

Town of Ophir Clerk

Additions to 7/7/22 Ophir P&Z Agenda Packet

For 9/14/22 Ophir P&Z Agenda



Office of the Treasurer and Public Trustee

Brandi R. Hatfield, Treasurer and Public Trustee

July 26, 2022
Dear Mr. Waller,

The information below was obtained from the San Miguel County Tax Rolls.

Tax account containing:	Tax year	Land or lots	Improvements
Lots 5 & 6, Block Q, Ophir	1916	\$ 30.00	\$ 640.00
	1917	\$ 30.00	\$ 500.00
	1918	\$ 30.00	\$ 500.00
	1919	\$ 30.00	\$ 400.00
	1920	\$ 30.00	\$ 300.00
	1957	Unable to locate Owner	
	1958	Unable to locate Owner	
	1959	Unable to locate Owner	
	1960	Unable to locate Owner	
	1961	Unable to locate Owner	
Lot 5, Block P, Ophir	1916	\$ 40.00	\$ 640.00
	1917	\$ 40.00	\$ 640.00
	1918	\$ 40.00	\$ 640.00
	1919	\$ 40.00	\$ 640.00
	1920	\$ 40.00	\$ 540.00
Lots 5, 8 & 9, Lot P, Ophir	1957	\$ 340.00	\$ 1,130.00
	1958	\$ 340.00	\$ 1,130.00
	1959	\$ 340.00	\$ 1,130.00
	1960	\$ 340.00	\$ 1,130.00
	1961	\$ 340.00	\$ 1,130.00
Lots 8 & 9, Block P, Ophir	1916	\$ 30.00	\$ 450.00
	1917	\$ 30.00	\$ 450.00
	1918	\$ 30.00	\$ 400.00
	1919	\$ 30.00	\$ 300.00
	1920	\$ 30.00	\$ 200.00

If you need additional assistance, please contact me as I am happy to assist.

Kind Regards,

Brandi R. Hatfield
Brandi R. Hatfield



May 19, 2009

David T. Cornwall
Joyce A. Whitaker
2186 Brittany Colony Dr.
League City, TX. 77573

Dear Mr. Cornwall and Mrs. Whitaker,

I am writing in response to your letter dated May 1, 2009 to Ophir Town Clerk Rhonda Claridge re Cornwall Property Block 2, Lots 1 – 10 and accompanying Land Use Code (LUC) Amendment application seeking to rezone the same as “buildable lots in a moderate/blue hazarde zone area.” It is understood that these ten lots currently fall within the Town’s high hazard avalanche zone district.

As Town Manager, I have undertaken a completeness review of your application, and note that Ophir Land Use Code provides in pertinent part:

§ 1402.2 Application for an amendment to this LUC shall be filed with the Town Clerk of Ophir, and shall contain the following information:

- A.** A legal description of the land to be rezoned, and requested new classification, along with a sketch to scale showing boundaries of the area requested to be rezoned, along with an indication of the existing zoning on all sides of the area.
- B.** A statement of justification for the rezoning, including one of the following conditions: Changed conditions in area, compliance with the Town of Ophir Master Plan for the area, or peculiar suitability of the site to a certain use.
- C.** Description and sketches, if available, of buildings or uses within 200 feet of the proposed area of change, in all directions.
- D.** Time schedule for any contemplated construction.
- E.** Justification for change of use.
- F.** Effect that zoning would have on adjacent uses.

§1403. APPLICATION SUBMITTAL REQUIREMENTS.

§1403.1 Ten (10) copies of a complete application as set forth in Appendix A. Forms: Land Use Code Amendment Application.

Moreover, Appendix A: Form for Land Use Code Amendments requires:

(4) Proof of Ownership by title commitment or attorney opinion.

You inquired as to this proof of ownership requirement in a phone conversation we had regarding your forthcoming application, and after soliciting the opinion of our Town Attorney, I responded via email on April 24, 2009 that you should "provide either a copy of the actual deed to the property or a copy of the current title insurance policy." Unfortunately, the real property tax document you provided does not identify you as owners of record of the property. While you noted that you are in the process of having title transferred to you as a result of certain probate matters, you did not provide proof of ownership by a title commitment or attorney's opinion as required by the LUC and application.

While I am entirely sympathetic to your ownership argument and have no reason to believe that you will not succeed in having title transferred to you, I am not in a position to make any independent determination or opinion of property ownership, nor am I qualified to do so. That is exactly why the title company or attorney opinion documents are instead required.

Accordingly, I have no choice but to find your application to be incomplete and am therefore returning your application fee check in the amount of \$500, together with all ten copies of your application.

In the future, should you choose to resubmit once you are able to establish ownership, please also address the following items in order to have a complete application:

- clarify zone district classification sought;
- include sketch to scale, zoning designation of surrounding properties (not copy of report excerpt);
- include description of uses and buildings if any within 200';
- time schedule;
- address 1402.F. For example, if rezoning to Moderate Avalanche Hazard District occurred and (up to 5) buildings were then built in the rezoned area after receiving a Special Use Permit, please have your engineer address the potential effect of the deflection of snow would have on adjacent uses. This may include, but is not necessarily limited to, the impact to buildings potentially affected by any deflected avalanches and the secondary effects any such residential rezoning may have on snow removal efforts activity in the area.

Should you have any questions, please contact me at your convenience at the Town Hall office.

Sincerely,

Jason S. Wells,
Ophir Town Manager

Cc:

Stephen B. Johnson, Town Attorney
Rhonda Claridge, Town Clerk
Randy Barnes, Mayor of Ophir
Suzanne Beresford, Chairperson, Ophir Planning and Zoning Committee

5 of 11,143 < >

Jun 24, 2019, 7:47 PM

Jun 24, 2019, 7:48 PM 

Jun 25, 2019, 10:01 AM ☆ ↩ ⋮

Joseph Waller

Joseph Waller

To: Chris Wilbur <geowilbur@gmail.com> --

Joseph Waller <joseph@josephwaller.com>
to Chris ▾

Chris,

The Treasurer confirmed Block P lots 11-12 have never been assessed with an improvement.

Did you get a chance to connect with Art to discuss?

I am looking to be on the July GA calendar for a vote requesting the Cornwall lots be removed from the high hazard map.

...

1000

...

Jun 27, 2019, 9:51 AM 

Chris Wilbur

Art said that he did not have any info and that Jack Ives might know the answer.

5 of 11,143

Chris Wilbur <geowilbur@gmail.com> Jun 24, 2019, 7:39 AM ☆ ↩ ⋮

Thanks for the info. I'll ask Art if he remembers anything about "houses 1 & 2". Why would they publish that if it were not true or verified? Could it have been the April 1959 wet slide?

Chris

Wilbur Engineering, Inc.

www.mearsandwilbur.com

Joseph Waller Jun 24, 2019, 12:01 PM ☆

Chris: I will have the Treasurer research 1959 as well.

Joseph Waller Jun 24, 2019, 6:46 PM

Ophir Clerk

From: Joseph Waller <joseph@josephwaller.com>
Sent: Friday, September 9, 2022 3:53 PM
To: Ophir Clerk; John Wontrobski
Subject: Re: July 7th P&Z Deflection Request

John,

Please include this response to the deflection request.

On Sun, Aug 21, 2022 at 1:01 PM Joseph Waller <joseph@josephwaller.com> wrote:

John,

The remaining item that P&Z requested is to have an engineer address the potential effect deflection of snow would have on adjacent uses. As the Town Attorney mentioned at the P&Z meeting, this request stems from the Jason Wells email and the Jason Wells letter. These documents are based on the assumption that structures were affected by a wet slide as quoted from his email dated 01/22/2019.

"And while you noted that your lots have never been subject to avalanche events to your knowledge, I have been informed that structures below your properties have in fact been affected, a fact which obviously carries some pertinence."

The two San Miguel County Tax Roll reports provided in the July 7th application, as well as the additional tax roll request by P&Z, "to provide an expanded search beyond the hazard map" dated July 22 show that the Jason Wells statement is not accurate.

Mr. Wells's letter dated 05/19/2009, asks to address LUC 1402.F. This LUC does not exist. His letter has reference to rezoning to a Moderate Avalanche Hazard District, which is not our request. The action sought in the application is the removal of lots 1-10 block 2 from the high hazard area designation on the Town of Ophir Hazards Map.

The request for an engineer to address the potential deflection effect can not be fulfilled as the property is outside of a hazard zone.

Kind regards,

Joseph Waller
joseph@josephwaller.com
480 639 7307

--

Kind regards,

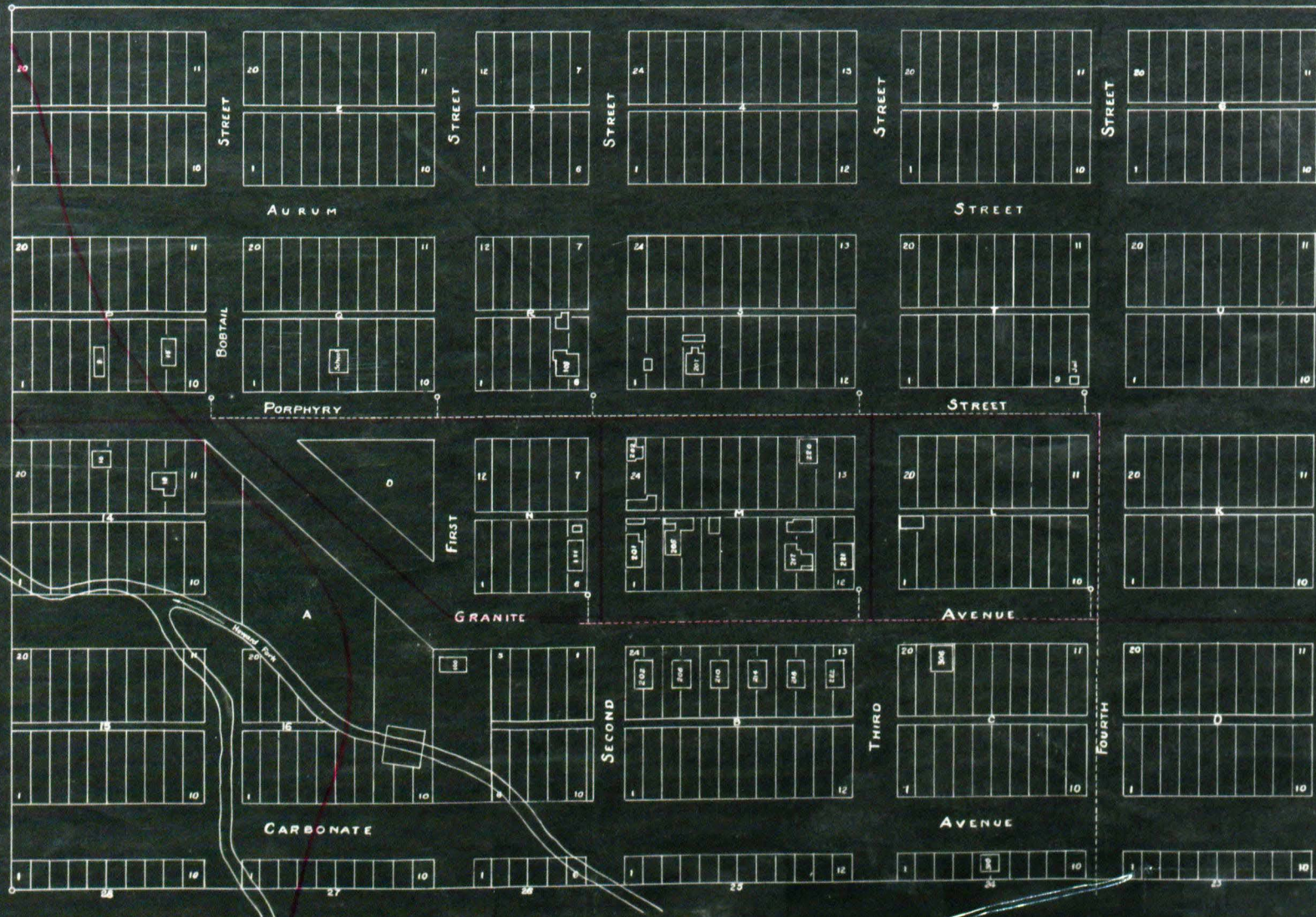
Joseph Waller
480 639 7307
joseph@josephwaller.com

1415.

C. There is demonstrated to be a material and substantial error in the existing zoning map or LUC text, the correction of which justifies the proposed amendment.

D. The proposed amendment is in conformance with or would implement the Ophir Master Plan, as amended.

E. The area proposed to be rezoned or reclassified with regard to a hazard overlay is peculiarly suitable for the uses permitted in the proposed new zone district or districts.



NEW S.H. 1945
ALIGNMENT
S-0153(10)

TOWNSITE OF OPHIR



R01872 84872

OPHIR CORPORATION
OPHIR, COLORADO
PLAT OF
OPHIR LOOP & OPHIR

SCALE 1" = 100'

3 OCTOBER, 1992

CG4314 .066 1952 .06

MINUTES OF THE REGULAR MEETING OF PLANNING AND ZONING COMMISSION

TOWN OF OPHIR, CO 81426

Thursday, July 7th, 2022 7:00 PM

REMOTE MEETING VIA ZOOM PLATFORM

CALL TO ORDER

(TIME: 7:10 PM)

P&Z Members: Phil Hayden (Chair), Mark Ridders, Jen Rose, Ernie Watenpaugh, Janice Gerona, Judah Kuper (joined 7:24)

Public: Mason Osgood (Clerk), John Wontrobski (Town Manager), Steve Johnson (serving as Town of Ophir Attorney), Joe Shults, Todd Rutledge, Stacy Passmore

APPROVAL OF AGENDA

Janice Gerona motions to approve the July 7th, 2022 P&Z Agenda, Ernie Watenpaugh seconds

Voting Members: Phil Hayden (Chair), Mark Ridders, Jen Rose, Ernie Watenpaugh, Janice Gerona

Not in Favor (Nay): None

Motion to approve the agenda passes unanimously

PUBLIC HEARING

2a Project Name: Cornwall Property Project Summary: The evaluation of avalanche hazard and mapping within lots 1-10, block two, Article 804 overlay adjustment, Appendix C Town of Ophir Hazards Map. Action Sought: Removal of lots 1-10, block two from the high hazard area designation on the Town of Ophir Hazards Map Legal Description: Lots 1-10, Block Two, Town of Ophir, Colorado Address: TBD Aurum Street Owner: Joyce Whitaker, David Cornwall Applicant: Joseph Waller

John Wontrobski presents historical timeline for the Cornwall Whittaker Property with the Town of Ophir

Steve Johnson explains the decision before P&Z this evening: either to approve, approve with conditions, or deny the Cornwall Whittaker Property to remove those specific lots from the high avalanche hazard zone. The decision would then go before the GA, with a recommendation from P&Z.

Steven Johnson asks P&Z members if anyone has a conflict of interest in this public hearing, all members reply "no." (Judah Kuper not present for this question)

Applicant Presentation- Joe Waller presents the application and his packet materials, included in the 7/7/22 P&Z packet. He utilizes several different avalanche hazard maps to present to P&Z and the public, and believes the INSTAAR map does not match the current hazard map.

Steven Johnson is recognized by the P&Z chair to ask questions on behalf of staff. He asks 1) What research has been done to confirm if houses 1 & 2 in the Art Mears Figure 10 map were moved after the April 1959 wet slide and whether these structures were on the ground in 1952 as shown in the 1952 Ophir

Plat map. Waller confirms he can do research to expand this question on what houses were potentially moved in this timeframe, and any assessed improvements on these lots.

The P&Z Chair closes the applicant presentation and moves to public questions.

Stacey Passmore is recognized, and asks if there is a debate whether there was an avalanche in the applicant's discussed location or is the debate whether or not the buildings were moved by the avalanche. Waller responds—the application is based on the INSTAAR map, and these three referenced houses are not in the hazard zone. He says the INSTAAR map says “estimated slide,” and we therefore do not know about this hazard zone. Stacey asks, has the town considered further impacts on open space, and water resources if they consider different applications similar to this, and further development in this town. She also asks if the town has standards for developing in the moderate hazard zone. Phil Hayden (chair) responds—yes there are standards to protect the safety and welfare of this community. Phil recognizes Steve J—Steve responds that the town's current position is Ordinance 2007-05 that no new structures can be built in moderate hazard zones, but only improvements of historical structures. Phil recognizes Joe Waller—applicant is asking that their lot be removed entirely, and correct the map. Waller also responds—the family has owned these lots from 1942 and have been paying taxes on it for this long and he says if he was on P&Z then these lots would be grandfathered in, and eliminate any other situations like this in the future. Steve Johnson is recognized and responds to the moderate hazard zone question—he clarifies that Waller is asking for complete removal from the hazard zone, Waller confirms.

Todd Rutledge is recognized, and asks about the INSTAR map, which seems to state as fact that houses were moved by avalanche, and the second reference to it, the outer limits of the wet spring avalanche. He asks, “are you reading the avalanche that moved from the wet spring avalanche, that *may* have been moved”? Joe Waller responds—if it was that clear, why did they not use the symbol that they use in the rest of the maps? Rutledge asks, isn't this a statement of fact in the map that these houses were moved? Joe Waller responds—this is why he can do further research to confirm this

Joe Shults is recognized, and asks if the INSTAAR map the dotted line in Old Ophir is the outer limit of zone 1. Waller responds clarifying the different avalanche zones in the INSTAAR map

Phil Hayden moves the discussion to questions from P&Z commission members

Janice Gerona asks about grandfathering in these lots, and if the Town is able to grandfather in lots and have an indemnification clause. Steve Johnson responds—yes we have indemnification requirements for structure in the hazard zone. He also says if we grandfather these zones, we would have to open up other similar lots or else it would be a denial of equal protection.

Ernie Watenpaugh asks Waller—on Resolution that is referenced about the adjustment of boundary in Block 11, and asks why it was included. Waller responds that this ordinance coincides with the same month that the modern map was made and this confirms that there were inconsistencies with the new map, and that corrections were made to match the INSTAAR map.

Mark Ridders is recognized, and asks does the applicant have quantitative data questions or the understanding of trying to put together different story lines and gaps. Mark clarifies asking multiple times whether Waller has actual data rather than inferring for this question at hand. Mark also says that one be taken over the other without quantitative data for one over the other.

Jen Rose, Judah Kuper, and Phil Hayden have no questions for the applicant

Steven Johnson is recognized, and asks why do you think the town is bound to restrict its mapping to the INSTAAR locations, and that the four variances are errors, do you not concede that they could have been made intentionally different based on knowledge not in the INSTAAR report, such as knowledge of a wet slide avalanche moving structures? Joe Waller responds—the reason this resolution presented is important is because the town defines match the west side of Block 11 with the INSTAAR map, they want the map to match INSTAAR. Steve responds with a question—is it your position that the Town is required to limit its hazard overlay map to the INSTAAR boundaries of zone 1 and 2? Joe Waller responds no.

Steve continues—speaking about houses 1 and two, and about how houses can create deflection. Steve clarifies that P&Z would like to have a deflection analysis done on this zone and is part of the application to satisfy the application requirements. Steve advises that this is included in supplemental information, the original ask is found in an email from Jason Wells, for example, what happens when new buildings are built, what type of deflection structures are needed. Phil Hayden confirms, this is necessary for the application.

Steven Johnson advises Phil to request supplemental information and re convene when this is done and finish deliberations.

Phil asks Steve if he will stick around for deliberations.

Steve responds and says he advises that P&Z requests this supplemental information and then comes back at a later date and deliberates.

Phil asks if there are any closing remarks of staff. Steve Johnson recommends that P&Z is ready to make a motion to continue to public hearing and ask the application for supplemental information on Lots P & Q, pre and post 1959 avalanche, and submit engineering analysis for avalanche deflection on Cornwall lots if there are to be developed.

Mark Ridders—so moved on the motion proposed by Steve Johnson. Jen Rose seconds this motion

Joe Waller—closing remarks on motion on the table. He has qualms about the engineering analysis and how he says the Cornwall lots are no in the hazard zone, but that Steve wants him to do an analysis on the basis that they are in the hazard zone. Steven clarifies that the engineering would be for any structures developed on the Cornwall lots and any impacts of avalanche deflection to neighboring properties.

Joe Waller asks another question—the town chose this as a high hazard zone, but why would you then include the Wilbur report, and yet Joe is asking for it to be removed from the high. Steve says whatever Mr. Wilbur would feel appropriate, but Joe says this is not what Wilbur would do, and Steve says there's going to have to be some assumptions about what this deflection analysis would say. Steve says the engineer can make assumptions based on existing mapping.

Ernie Watenpugh says to base the deflection analysis on a 100 year event.

Phil Hayden asks if there is any discussion on the motion. There is none.

Phil motions to vote, Mason Osgood leads the vote

All in favor: Ernie Watenpugh, Judah Kuper, Phil Hayden, Janice Gerona, Jen Rose, Mark Ridders

Not in favor: -

Motion to approve the continuance of this hearing and addition to supplemental information from the Application is approved.

Phil Hayden motions to hold continuance of P&Z public hearing on Wednesday September 14th, Janice Gerona seconds

All in favor: Ernie Watenpaugh, Judah Kuper, Phil Hayden, Janice Gerona,, Mark Rikkens

Not in favor: -

Abstain-Jen Rose

Motion to approve the continuance of this hearing till Wednesday September 14th passes

NEW BUSINESS

No new business

ADJOURN

Having reached the end of the agenda, and with no new business presented, Phil Hayden declared the meeting adjourned at 8:50pm

Town Clerk, Mason Osgood

Date

Minutes prepared by Mason Osgood, Town Clerk

Audio recordings of all Planning and Zoning meetings are available to the public. Please contact the Town Clerk if you would like a copy of this month's audio of the meeting minutes.

MINUTES OF THE REGULAR MEETING OF PLANNING AND ZONING COMMISSION

TOWN OF OPHIR, CO 81426

Thursday, September 14th, 2022 7:00 PM

IN PERSON AND REMOTE MEETING VIA ZOOM PLATFORM

CALL TO ORDER

(TIME: 7:10 PM)

P&Z Members: Phil Hayden (Chair), Mark Rikkers, Ernie Watenpaugh, Judah Kuper

Public: Mason Osgood (Clerk), John Wontrobski (Town Manager), Steve Johnson (Serving as Town of Ophir Attorney), Joe Shults, Joe Waller (Applicant), Jonathan Cooper

APPROVAL OF AGENDA

Ernie Watenpaugh motions to approve the July 7th, 2022 P&Z Agenda, Mark Rikkers seconds

Voting Members: Phil Hayden (Chair), Mark Rikkers, Ernie Watenpaugh, Judah Kuper

Not in Favor (Nay): None

Motion to approve the agenda passes unanimously

APPROVAL OF MINUTES

Ernie Watenpaugh motions to approve the August 4th, 2022 P&Z Meeting Minutes, Phil Hayden seconds

Voting Members: Phil Hayden (Chair), Mark Rikkers, Ernie Watenpaugh, Judah Kuper

Not in Favor (Nay): None

Motion to approve the agenda passes unanimously

BUSINESS ITEMS

- A. Continuation of a July 7th public hearing in regard to an application to change to official mapping to Lots 1-10, Block Two, Town of Ophir, Colorado

Joe Waller Presents

Questions from P&Z Board and Staff with responses from Joe Waller

Public comments from Joe Shults (with presentation)

Public Hearing Closed

BUSINESS ITEMS (Cont.)

Discussion among P&Z Board and Town Staff

Judah Kuper motions to deny the application to change to official mapping to Lots 1-10, Block Two, Town of Ophir, Colorado – Seconded by Mark Ridders

Motion

I move that, based upon the application as amended and supplemented, testimony, evidence and public comments presented at public hearing on June 11, 2019, July 7, 2022 and today, the Ophir Planning and Zoning (P&Z) Commission recommend to the Ophir General Assembly, that the Cornwall-Whittaker application to remove Lots 1-10, Block 2, Town of Ophir from the High Hazard Avalanche Zone District, be denied, for the following reasons:

Applicant has failed to demonstrate by the preponderance of the evidence compliance with at least three criteria for approval of a zone map amendment. Specifically, P&Z finds that Land Use Code subsection 1415.C, REVIEW STANDARDS FOR CODE AND MAP AMENDMENTS is not met, insofar as no material or substantial error in the existing zoning map has been substantiated by the Applicant. Figure 10 of the 1976 Natural Hazards in Mountain Colorado INSTAAR Report included at page 46 of the rezoning application, documented that two houses located downhill from the Owner's property were moved by wet snow avalanches. These two houses were depicted in a 1952 plat map. The Report referenced a 1959 wet slide avalanche, based on reports of local residents. Based on common sense that documentation justified the Town including applicants' vacant uphill property in the high hazard avalanche zone district overlay when adopted in 1979, regardless of whether the INSTAAR avalanche modeling included the Applicant's property. Applicant's suggestions that a 1959 wet slab avalanche over applicant's property did not occur, and that those two houses were not moved by an avalanche, were not persuasive to overcome the INSTAAR documentation. I would also add the Group B avalanches shown on the INSTARR report looked clearly to me as defined as Zone 1 for the lots in question.

Applicant has failed to provide any written narrative explaining how the standards for rezoning approval are met, as required by LUC 1405. Applicant only cited verbatim LUC 1415 subsections C, D and E as in compliance criteria.

Applicant has refused to provide supplemental information specifically requested by P&Z concerning potential avalanche deflection if the rezoning were to be approved and structures were built on the owner's property.

Applicant has not submitted any depiction of the structures that could be built upon the Owners' property if rezoning were to be approved, as required by LUC section 1408.4.

The Owner's consultant, Wilbur Engineering, Inc., stated at page 6 in a 2007 Avalanche Study and Avalanche Hazard Analysis for the Owner's property, that the property is entirely within a "moderate/blue" avalanche hazard classification, but applicant has declined to seek rezoning to such classification.

Motion (Cont.)

The underlying zoning, which may be erroneous, is residential (despite open space being the only use permitted by right in an avalanche hazard zone). Ophir does not permit new residential construction in the moderate/blue zone. Accordingly, the application does not comply with LUC 1415.E.

The application fails to comply with the 2021 Ophir Master Plan, Goal M, detailed objective 3, as required by LUC section 1415.D:

Goal M: Prevent Damage Caused by Natural Hazards

Ophir residents are susceptible to certain natural hazards given the town's location and Ophir aims to protect its residents through ongoing awareness and education.

Promote land use patterns that eliminate or reduce potential development in natural hazard areas.

Voting Members: Judah Kuper, Phil Hayden, Ernie Watenpaugh, Mark Ridders

Not in Favor (Nay): None

NEW BUSINESS

Discussion of valuation of new building

ADJOURN

Motion to adjourn by Judah Kuper, Seconded by Phil Hayden

Ophir Valley

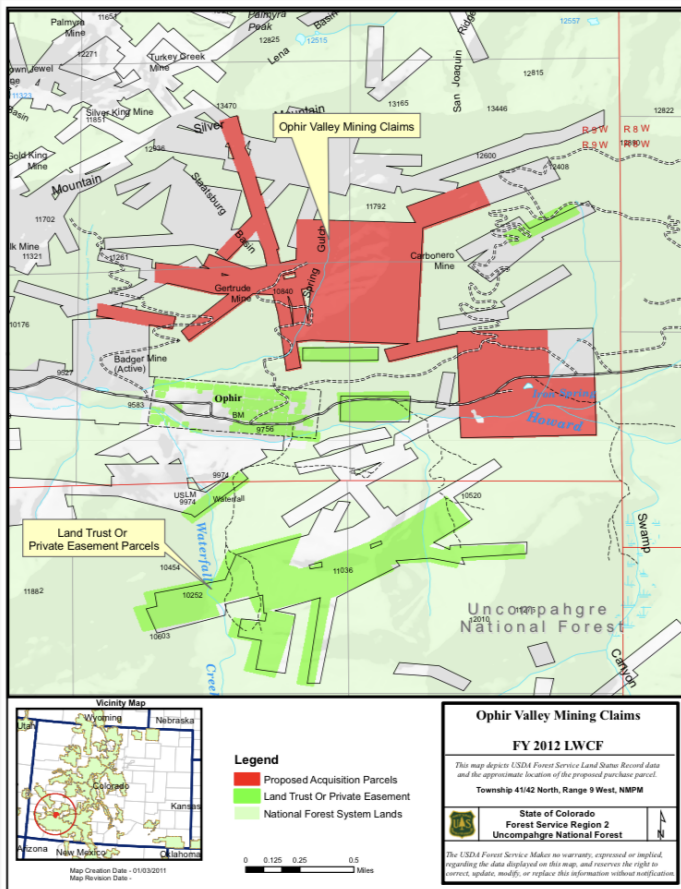


Photo credit: Flickr user Pasha C

The purchase of 1,100 acres just outside of Telluride in 2010 completed our protection efforts in the Ophir Valley, an endeavor nearly 10 years in the making. The final piece of land capped the preservation of more than 9,000 acres of high country mining claims in the triangle of land between Ouray, Silverton, and Telluride. Working closely with a key landowner, the San Miguel Conservation Foundation, local governments, and the Forest Service, virtually all the private lands surrounding the tiny town of Ophir are now permanently protected.



Member: Scott Tipton							
Location	12 Miles southwest of Telluride, CO. Found within the Ophir Valley surrounded by high mountain peaks.						
Purpose	Conserve and enhance significant scenic, recreation, rich historic mining culture, and several endangered species of wildlife/plant resources within the project area.						
Purchase Opportunities	The Trust for Public Land (TPL) is offering to sell the remainder of Ophir Valley (Phase V). TPL acquired the remaining property in 2009.						
Partner	The Trust for Public Land.						
Cooperators	Local county and municipal support, San Miguel County Commissioners, Colorado Division of Wildlife, San Miguel Conservation Foundation, and the Nature Conservancy.						
Project Description	<p>The Ophir Valley Project was developed in 2006. The Town of Ophir along, with the Trust for Public Land brokered an agreement with a private land owner who owns almost the entire Ophir Valley. Other lands within the area have been acquired through exchange, donation, and purchase. The Federal acquisition project originally consisted of approximately 1200 acres. Of this total, approximately 747 acres have been acquired in LWCF appropriations. To date, four phases have been completed, including Phase IV, which was completed utilizing non-LWCF funds, indicating the importance of this project. It is also part of a larger effort which includes other public and private conservation property acquisitions and easements.</p> <p>This project could be considered a natural extension of the successful Red Mountain Project (\$9.6 million LWCF funding), located just three miles to the north and east. The Ophir Valley currently lies immediately adjacent to the proposed Northern San Juan's Wilderness. The valley and surrounding hillsides are home to the endangered Canadian Lynx and Uncompahgre fritillary butterfly. Continued acquisition would protect breathtaking mountain vistas, including a portion of the Howards Fork drainage some 2,500 feet below the top of Ophir Pass, Phase V would complete the project. Recreational access for hunting and four-wheel drives, fishing, rock climbing, sightseeing, camping, hiking, and horseback riding would be significantly enhanced. Phase V would result in \$60,000 savings in landline maintenance alone. Acquisition into Federal ownership will provide significant watershed protection to the Howard's Fork of the San Miguel River.</p>						
O&M Cost	Estimated "start up" cost: \$0 Estimated "annual" maintenance: \$0						
History Costs to date:	<table border="1"> <tr> <td>FY 2008</td> <td>\$ 835,000</td> </tr> <tr> <td>FY 2010</td> <td>3,427,644</td> </tr> <tr> <td>Total</td> <td>\$4,262,644</td> </tr> </table>	FY 2008	\$ 835,000	FY 2010	3,427,644	Total	\$4,262,644
FY 2008	\$ 835,000						
FY 2010	3,427,644						
Total	\$4,262,644						
Strategic Goal	Provide for a quality recreation experience, including access, and enjoyment of natural and cultural resources on Forest Service managed and partnered lands and waters.						



AVALANCHE MAPPING AND HAZARD ANALYSIS

PAULS PROPERTY, OPHIR AREA

SAN MIGUEL COUNTY, COLORADO

Prepared For

Mr. Glen Pauls

Prepared By,

Arthur I. Mears, P.E., Inc.

Gunnison, Colorado

September, 2002

ARTHUR I. MEARS, P.E., INC.

Natural Hazards Consultants

555 County Road 16
Gunnison, Colorado 81230
Tel/Fax: 970-641-3236
artmears@rmii.com

September 23, 2002

Mr. Glenn Pauls
Box 426
Placerville, CO 81430

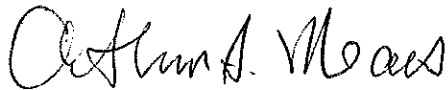
Dear Mr. Pauls:

The attached mapping and evaluation of avalanche hazard within and near your property has been prepared as specified in my proposal dated March 13, 2002.

The report consists of two parts: (a) the text portion, and (b) the avalanche map, which is separate from the text.

Please contact me if you have any questions.

Sincerely,



Arthur I. Mears, P.E.
Avalanche-control engineer

Encl.

1 OBJECTIVES AND LIMITATIONS

This report, as requested by Mr. Glenn Pauls and Peter Jamar, and as specified in my proposal of March 13, 2002 has the following **objectives**:

- a. Mapping of design-magnitude¹ avalanche in areas within and immediately adjacent to the Pauls property near Ophir;
- b. Computation of the dynamics and destructive potential of these avalanches; and
- c. Evaluation of the suitability of utilizing the properties as residential building sites.

The report also has the following **limitations**, which must be understood by all those relying on the results:

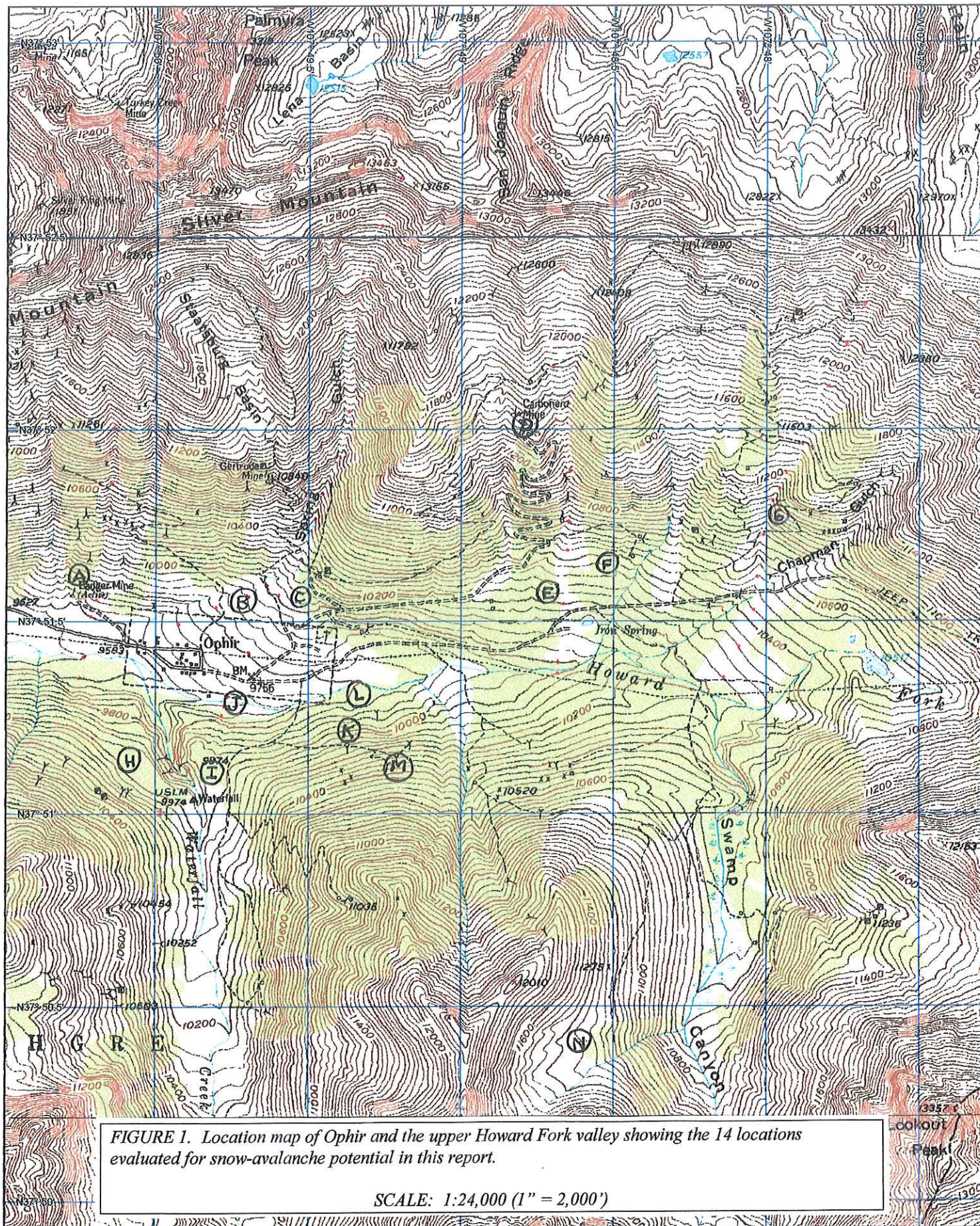
- a. This report evaluates avalanche potential during current forest cover conditions; widespread timber clearing by natural (e.g., forest fire) or man-caused conditions could increase avalanche potential;
- b. Even larger avalanches (e.g. 300 or 1000-year return period events) could occur and exceed the sizes mapped;
- c. Numerous avalanches occur in the Ophir valley outside the limits studied; these have not been mapped; and
- d. This report is not complete without the detailed topographic maps (Figures 3, 4 and 5).

2 TERRAIN, HISTORY AND DESIGN-MAGNITUDE AVALANCHES

2.1 Terrain and history

The terrain within the study area is shown on Figure 1, a 1:24,000-scale (1" = 2,000') topographic map based on U. S. Geological Survey data and aerial photography taken in 1951. The 14 properties considered in this analysis are labeled "A" through "N," ("E" and "F" are west and east sides of the Iron Springs Placer) and were specified by Mr. Glenn Pauls on a topographic map sent to me in March, 2002. This figure is simply a location map intended to relate property locations to the general topographic setting of the valley. The property boundaries and limits of design avalanches are shown in greater detail on the large-scale topographic maps (Figures 3, 4 and 5) accompanying this report.

¹ Design-magnitude avalanche – In San Miguel County, this avalanche is the largest and most destructive event expected in approximately 100 years and must be considered in land-use planning and engineering. The true return period of such an event is difficult to determine precisely, therefore may lie between 30 and 300 years. Some jurisdictions in Colorado (e.g. Gunnison and Pitkin Counties) and elsewhere (Switzerland, Norway, Iceland) require that the 300-year or 1000-year event be considered.



The Ophir valley is a classic, glacially-eroded “U-shaped” valley, encompassing roughly 4,000 vertical feet, from approximately 9,500 feet west of Ophir to 13,500 feet at the higher peaks. The higher terrain (generally above 11,500 feet) averages greater than 30° inclination and in many locations is devoid of tree cover. The valley receives relatively heavy snowfall and strong winds during many snow seasons, a period that can last from November through May. The combination of steep terrain, numerous open slopes devoid of trees that would anchor the snowpack, and occasional heavy, windy snowstorms can and has produced large snow avalanches. Figure 2 is a U. S. Forest Service aerial photograph of the valley showing many distinct linear scars through the forest which were created by snow avalanches. Typically, these scars extend downslope from the starting zones² through the forest. This impact damage is clear evidence that avalanches have occurred repeatedly. Forest destruction and application of avalanche-dynamics equations has been used in this study to estimate runout potential.

FIGURE 2. U.S. Forest Service aerial photo (dated 10-5-97) of Ophir and the upper Howard Fork valley. Numerous avalanche paths appear as distinct downslope-oriented scars through the forest and provide clear evidence of large avalanches.



Historic evidence also exists for large avalanches within and near Ophir. For example, a large dry-snow avalanche beginning in Spring Gulch (perhaps Staatsburg Basin) completely crossed the alluvial fan upon which the Town of Ophir is located and impacted trees on the south side of the Howard Fork as recently as the 1950's. Trees within the impact area are missing limbs 20-30 feet above ground level. The impact area has been re-colonized by smaller, younger trees but is clearly visible today. Wet-snow avalanches from Spring Gulch have reached and moved houses in Ophir at various times since Ophir

² Starting zone – Terrain inclined at more than 30° (sometimes as little as 25°) where avalanches begin, increase in mass and accelerate. Large starting zones (with more than 30 acres) are common in the Ophir valley and can produce large avalanches.

was founded in the late 19th century and the road between Ophir Loop and Ophir is blocked by large avalanches from both north and south sides of the valley every few years. Extensive avalanching on this part of the road occurred as recently as December, 1983. That year many dry-snow avalanches moved large volumes of loose rock to the road. While the historic avalanches have not affected much of the Pauls property (see section 4), the physical and historic evidence of avalanches in combination with the terrain and climate provides convincing evidence of avalanche potential throughout the valley.

2.2 Determination of the design-avalanche limits

Although inspection of terrain and forest cover provides, in many cases, evidence of design avalanche extent and frequency it does not indicate avalanche destructive energy, or impact-pressure potential³. Furthermore, avalanches apparently have not been as large as possible in certain paths even though large starting zones exist within these paths. For these reasons, the design-avalanche characteristics must be computed. Computational methods are described in some detail in Colorado Geological Survey Bulletin #49⁴. In this study the following 2-step procedure was used:

1. Step 1 – The *stopping position* of the design avalanche was determined in the field and on maps through inspection of damage and destruction to the forest, by geomorphic evidence of avalanche extent, and were computed through use of regression analysis based on a Colorado database of large avalanches.
2. Step 2 – After the stopping position was determined, a 3-component, stochastic, *avalanche-dynamics model* was used to match that stopping position and predict avalanche speeds and impact-pressure potentials.

Examples of the computational techniques are provided in the technical appendix.

3 RED AND BLUE HAZARD ZONES AND LAND USES

In accordance with customary practice used in San Miguel County, elsewhere in Colorado and in selected jurisdictions within the United States⁵ avalanche-hazard zones for land-use or engineering purposes are defined as follows:

1. Red Zone (high hazard) – Avalanches here have (a) return periods of 30 years or less (constant annual probabilities of 1/30 or about 3%), or (b) produce

³ Both impact pressure potential *and* frequency are needed to determine hazard zones (the “red” and “blue” zones), as discussed in Section 3.

⁴ Mears, A. I., 1992, Snow Avalanche Hazard Analysis for Land-Use Planning and Engineering, Colorado Geological Survey Bulletin #49, 82 p.

⁵ Hazard-zone definitions and permitted land uses within hazard zones differ from one location to another within the United States because they reflect local (county or municipal) ordinances. National standards do not exist.

impact pressures of 600 lbs/ft² or more, or both “a” and “b.” Residential construction in the red zone is usually prohibited because of the engineering difficulties associated with mitigation design for large forces or because of high human exposure within frequent avalanche areas.

2. Blue Zone (moderate hazard) – Avalanche here have (a) return periods of 30 to 100 years (constant annual probabilities of about 3% to 1%) *and* (b) produce impact pressures *of less than* 600 lbs/ft². Both conditions “a” and “b” must be satisfied or the area is defined as a red zone. Residential construction may be permitted in a blue zone if engineered mitigation is used to protect property and reduce risk to an acceptable level.

The outer limits of the blue zone defines the design-avalanche limits. A “white zone” exists beyond the design avalanche. This is an area where avalanche hazard is considered to be sufficiently small to be disregarded in zoning and land-use regulation.

4 EXPOSURE OF PAULS PROPERTY TO DESIGN AVALANCHES

The following lists 14 properties identified by Mr. Glenn Pauls (the Iron Springs Placer has been subdivided into “E” and “F”). Each area was identified on the location map (Figure 1) and on Figures 3, 4, and 5. The exposure of each site is rated “High” (Red Zone), “Moderate” (Blue Zone), and “White” (No avalanche hazard).

A. Badger Mine Area

Site Exposure Classification: Blue Zone (Moderate Hazard)

This site is located in the forest next to the valley floor just above the convergence of two large, frequent avalanche paths. These paths can release simultaneously or independently and both are capable of crossing to the south side of the valley. The largest avalanches will result from release of dry slabs and will quickly evolve into dry-flowing avalanches with an associated powder blast. The current mine remains are exposed to powder blast and low density, dry-flowing snow. Calculations indicate the potential building site is exposed to a powder blast stagnation pressure in the range of 100-150 lbs/ft². Avalanches reaching the site would have return periods greater than 30 years. Thus, on the basis of pressure and return period characteristics, the site is located in a Blue Zone (Moderate-Hazard). Special building construction to resist the forces from the exceptionally large and rare avalanche event will be necessary in site development.

B. Spring Gulch Alluvial Fan North of Ophir

Site Exposure Classification: Red Zone (High Hazard)

This property, (which has not been identified by mining claim boundaries), can be overrun by large, deep, slow-moving wet snow avalanches from Spring Gulch and avalanches from the slope north of Ophir. Although speeds will be low (thus enabling the sharp deflection of wet-snow debris to the west on the fan), debris depths can be 10-20 feet. Large pressures from the weight of avalanche debris, as well as horizontal impact pressures will be possible. Return period of avalanches across most of this site appear to be greater than 30 years, however the potentially large pressures classify the site as a Red Zone. Mitigation, in the form of a large earthen deflecting berm could be constructed to protect this site from Spring Gulch, however such a berm *cannot be used* because it will increase the avalanche risk at the old Ophir town site.

C. Bonita Site (MS5978)

Site Exposure Classification: Red Zone (High Hazard)

The site is within the aspen forest at the extreme southeasterly corner of the mining claim MS5978. It is exposed to major dry-snow, powder, or wet snow avalanches from Spring Gulch. When major avalanche occur they will overrun the site, destroy and entrain aspen trees and possibly loose rock into the flow, and will reach down to portions of east Ophir. Although frequency of avalanches may be roughly 30 years or more on the Bonita Site, potential impact forces will exceed 3,000 lbs/ft², thus classifying the site as lying in the Red Zone. Mitigation would not be practical.

D. North Star Lode (MS16505)

Site Exposure Classification: White Zone (No avalanche exposure)

The site is located on a south-facing ridge at approximately 11,500 feet elevation. This ridge splits the flow from two major avalanches (which may release independently or simultaneously) that descend gullies to the east and west of the site. A building site could be built into the hillside such that it would be protected from avalanches. However, care must be taken to chose the building site carefully to avoid the powder blast and flowing avalanche impact from these large avalanches. Access to the site via the existing road would only be practical during stable snow conditions.

E. Iron Springs Lode, West side (MS947)

Site Exposure Classification: White Zone (No avalanche exposure)

Hazard-free areas do exist on both the west and east sides of a large avalanche path that splits this mining claim. Mitigation would not be required to protect buildings within these

areas. However, care must be taken to choose the building sites carefully so they are outside the hazard boundaries to avoid the powder blast and flowing avalanche impact.

F. Iron Springs Lode, East side (MS947)

Site Exposure Classification: White Zone (No avalanche exposure)

Hazard-free areas do exist on both the west and east sides of a large avalanche path that splits this mining claim. Mitigation would not be required to protect buildings. However, care must be taken to choose the building sites carefully so they are outside the hazard boundaries to avoid the powder blast and flowing avalanche impact.

G. Black Cloud Lode (MS10161)

Site Exposure Classification: Blue Zone (Moderate Hazard)

This site, as identified on the detailed topographic map and visited in the field, would be subject to powder blast forces resulting from large avalanches descending the gully immediately to the west. Powder-avalanche pressures would be in the 150-200 lbs/ft² range and would require special building design. Care must be taken to locate the building(s) carefully to avoid impact with the high-speed flowing avalanche in the gully although powder blast forces probably cannot be avoided.

H. Idaho (MS18866)

Site Exposure Classification: White Zone (No Avalanche Exposure)

This site, which is located on a flat bench on the west side of lower Waterfall Canyon is free of avalanche exposure and does not require mitigation.

I. Climax and E.V.Y. (MS15652)

Site Exposure Classification: White Zone (No Avalanche Exposure)

This site, which is located on a flat bench on the east side of lower Waterfall Canyon is free of avalanche exposure and does not require mitigation.

J. Gold Fraction Placer (MS12322)

Site Exposure Classification: Blue Zone (Moderate Hazard)

This site is located on the south side of the Howard Fork below the alluvial fan of Spring Gulch. The site is located in the extreme outer (southern) end of the runout zone of dry-snow and powder avalanches from Spring Gulch. Evidence for such avalanches exists on the south side of the creek immediately to the east of the Gold Fraction Placer, as

discussed in Section 2.1. Building within this area would require reinforcement for avalanche impact loads in the range of 100-150 lbs/ft².

K. West Branch (MS15496)

Site Exposure Classification: White Zone (No Avalanche Exposure)

An existing building is located on site and apparently has not been reached by avalanches, although avalanches do flow down a narrow gully immediately to the east of the site.

L. Victor (MS14532)

Site Exposure Classification: White Zone (No Avalanche Exposure)

This property is located on the south side of the Howard Fork, east of Ophir. Narrow avalanches which are confined to shallow gullies can reach the southern edge of the property during the unusual design avalanche conditions, however avalanche-free sites are located on the northern portion of the property.

M. American (MS15946)

Site Exposure Classification: Blue Zone (Moderate Hazard)

Small avalanches flow through the forest (some are channelized by small gullies) and could reach a building on this site. Reinforcement for avalanche impact-loads would be practical, or building a shed roof-type avalanche defense over the building could be used.

N. Sailor Boy Millsite (MS 1115B)

Site Exposure Classification: Red Zone (High Hazard)

This property is located in a tributary drainage of Swamp Canyon Creek. Although it is on a lower-gradient portion of the cirque, large avalanche starting zones exist on slopes west of and approximately 600-800 feet above the site. Relatively small avalanches would be relatively frequent in the vicinity of the site (once per every 10-30 years or possibly more often) and major avalanches would possess substantial destructive energy. Mitigation would not be practical.

Mitigation for sites in the blue zone depends on final details about building (a) location, (b) shape, (c) orientation, and (d) avalanche-dynamics. These parameters must be specified in detail before final avalanche mitigation design can proceed. The above indication of avalanche-dynamic pressures are for hazard zonation purposes only. Design criteria for each building site must be developed on a site-specific basis.

The exposures to avalanche hazard of the 14 sites studied are summarized in Table 1.

Table 1. Avalanche Exposure (Hazard Zones) of Pauls Properties near Ophir, Colorado

Letter	Property Name	Hazard Level
A	Badger Mine	Blue
B	Spring Gulch Fan (north of Ophir)	Red
C	Bonita Site	Red
D	North Star Lode	White
E	Iron Springs West	White
F	Iron Springs East	White
G	Black Cloud Lode	Blue
H	Idaho	White
I	Climax & E.V.Y.	White
J	Gold Fraction Placer	Blue
K	West Branch	White
L	Victor	White
M	American	Blue
N	Sailor Boy	Red

The breakdown of avalanche-zone exposure of the 14 properties studied in this report is as follows:

Red Zone (High Hazard): 3
 Blue Zone (Moderate Hazard): 4
 White Zone (Avalanche-free at site): 7.

Report Prepared By,



Arthur I. Mears, P.E.
 Avalanche-control engineer

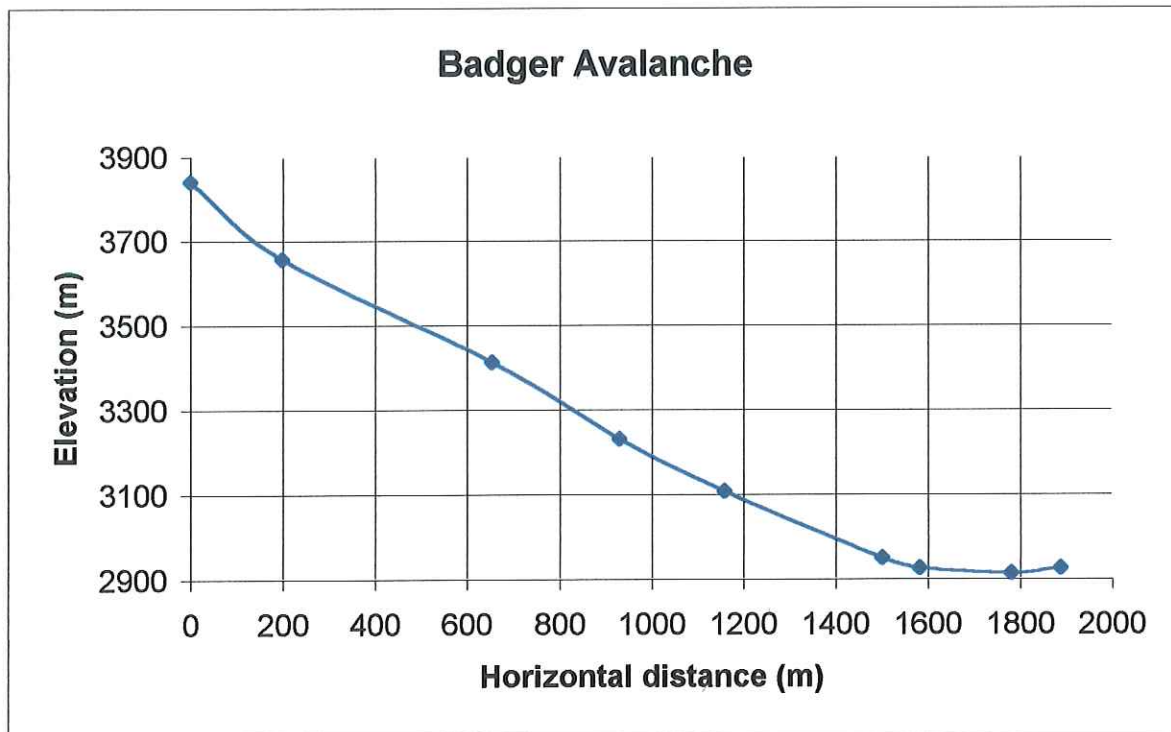
TECHNICAL APPENDIX

This technical appendix consists of two sections per site. Each site is identified by name and consists of (a) a detailed avalanche path profile broken down into several profile segments and the topographic parameters (length, vertical angle, horizontal and vertical distances) within each segment and (b) a summary of the avalanche-dynamics (speeds of the front and overall average speeds) computed as discussed in the text of the report. These were used to evaluate impact-pressure potentials for Red and Blue hazard-zone definitions.

Avalanche Profile and x/y coordinates

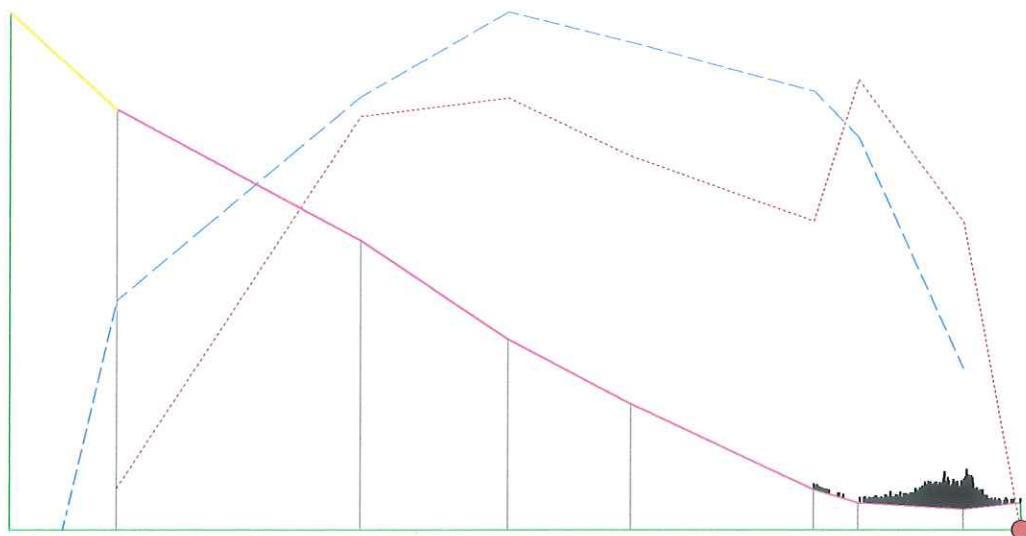
Badger

Raw Data in feet		Data in meters		Segment Data			
X-feet	Y-feet	X-meters	Y-meters	L-meters	Ang - Deg	Sum L	Avg Angle
0	12600	0	3841			0	
650	12000	198	3659	270	42.7	270	42.7
2150	11200	655	3415	518	28.1	788	33.1
3050	10600	930	3232	330	33.7	1118	33.3
3800	10200	1159	3110	259	28.1	1377	32.3
4920	9680	1500	2951	376	24.9	1753	30.7
5190	9600	1582	2927	86	16.5	1839	30.0
5840	9560	1780	2915	199	3.5	2038	27.5
6190	9600	1887	2927	107	-6.5	2145	25.9



1344 particles start from top segment.

3217 particles deposited.



c:\plk\Badger.txt

Path drops: 925 m

Friction $\mu = 0.25$

$\log M/D = 2.80$

Random $R = 0.300$

$\alpha = 25.8$ degrees

● Front stops at $X = 1885$ m

..... Front speed (max = 34.7 m/s)

----- Mean speed (max = 40.0 m/s)

_____ Deposition (not to scale)

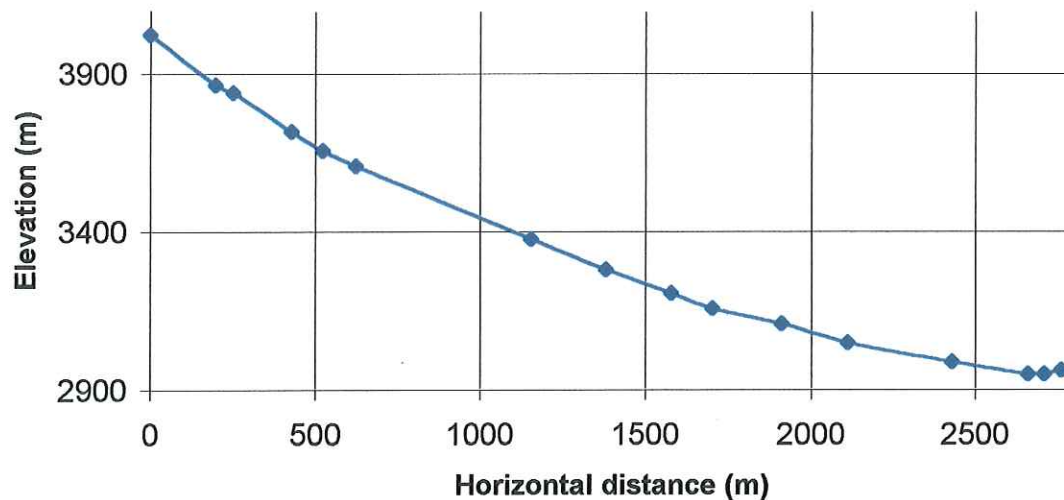
Exit and view distributions
in your file c:\plk\results.txt

Avalanche Profile and x/y coordinates

Spring Gulch (dry)

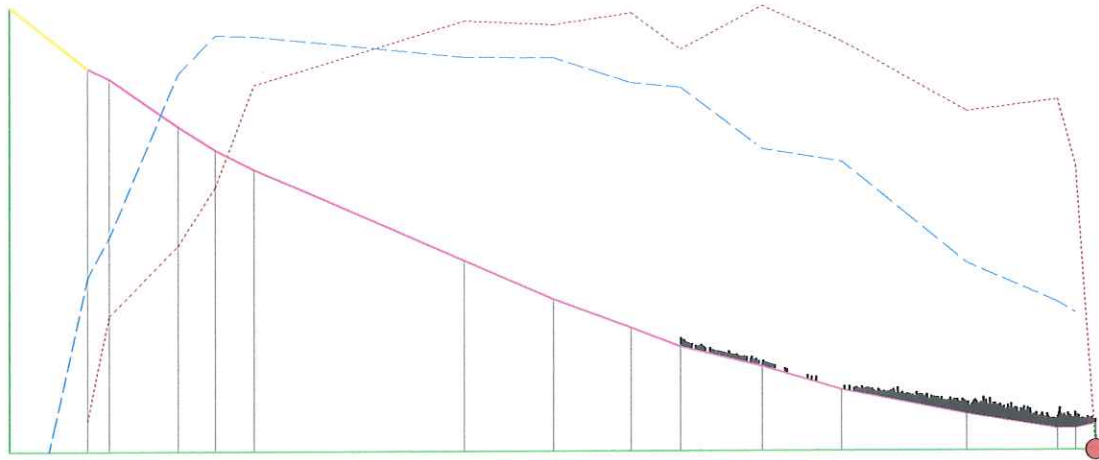
<u>Raw Data in feet</u>		<u>Data in meters</u>		<u>Segment Data</u>			
X-feet	Y-feet	X-meters	Y-meters	L-meters	Ang - Deg	Sum L	Avg Angle
0	13200	0	4024			0	
650	12680	198	3866	254	38.7	254	38.7
830	12600	253	3841	60	24.0	314	35.9
1410	12200	430	3720	215	34.6	529	35.3
1720	12000	524	3659	112	32.8	641	34.9
2040	11840	622	3610	109	26.6	750	33.7
3790	11080	1155	3378	582	23.5	1332	29.2
4530	10760	1381	3280	246	23.4	1578	28.3
5180	10520	1579	3207	211	20.3	1789	27.4
5590	10360	1704	3159	134	21.3	1923	26.9
6270	10200	1912	3110	213	13.2	2136	25.6
6930	10000	2113	3049	210	16.9	2346	24.8
7970	9800	2430	2988	323	10.9	2669	23.1
8720	9680	2659	2951	232	9.1	2901	22.0
8880	9680	2707	2951	49	0.0	2950	21.6
9050	9720	2759	2963	53	-13.2	3003	21.0

Spring Gulch (dry) Avalanche



1266 particles start from top segment.

4002 particles deposited.



c:\plk\Spring Gulch Dry.txt

Path drops: 1072 m

Friction $\mu = 0.25$

$\log M/D = 3.10$

Random R = 0.300

Alpha = 21.0 degrees

● Front stops at X = 2757 m

..... Front speed (max = 44.7 m/s)

----- Mean speed (max = 41.8 m/s)

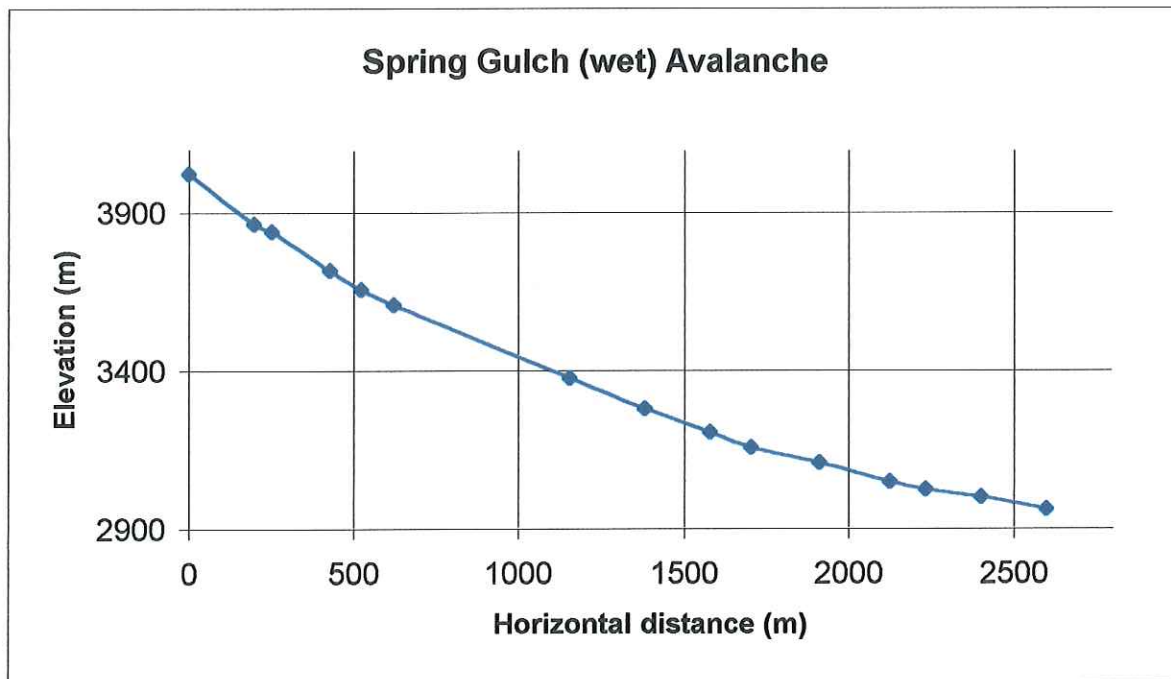
_____ Deposition (not to scale)

Exit and view distributions
in your file c:\plk\results.txt

Avalanche Profile and x/y coordinates

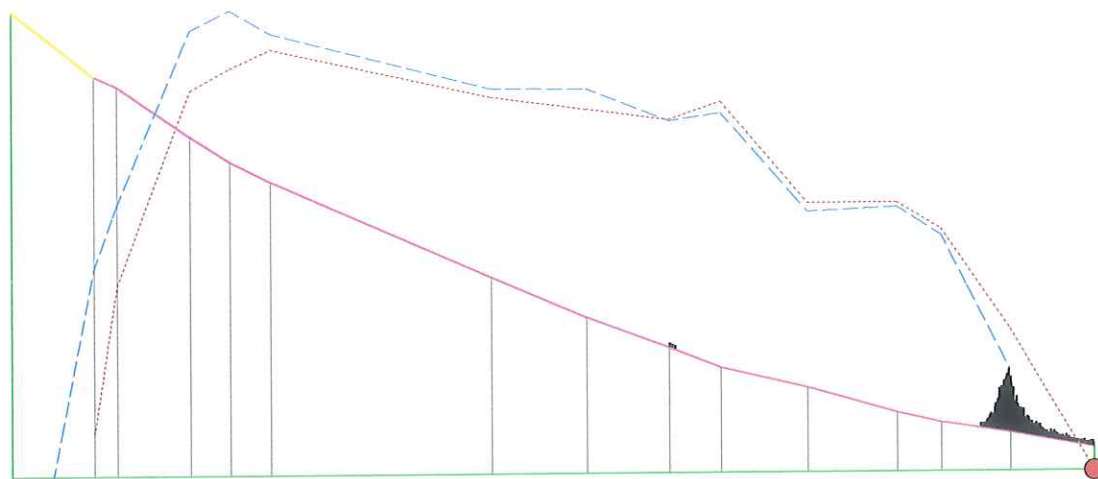
Spring Gulch (wet)

<u>Raw Data in feet</u>		<u>Data in meters</u>		<u>Segment Data</u>			
X-feet	Y-feet	X-meters	Y-meters	L-meters	Ang - Deg	Sum L	Avg Angle
0	13200	0	4024			0	
650	12680	198	3866	254	38.7	254	38.7
830	12600	253	3841	60	24.0	314	35.9
1410	12200	430	3720	215	34.6	529	35.3
1720	12000	524	3659	112	32.8	641	34.9
2040	11840	622	3610	109	26.6	750	33.7
3790	11080	1155	3378	582	23.5	1332	29.2
4530	10760	1381	3280	246	23.4	1578	28.3
5180	10520	1579	3207	211	20.3	1789	27.4
5590	10360	1704	3159	134	21.3	1923	26.9
6270	10200	1912	3110	213	13.2	2136	25.6
6970	10000	2125	3049	222	15.9	2358	24.7
7320	9920	2232	3024	109	12.9	2467	24.1
7870	9840	2399	3000	169	8.3	2637	23.1
8520	9720	2598	2963	202	10.5	2838	22.2



1266 particles start from top segment.

3844 particles deposited.



c:\plk\Spring Gulch wet.txt

Path drops: 1060 m

Friction $\mu = 0.18$

$\log M/D = 2.60$

Random $R = 0.100$

Alpha = 22.2 degrees

● Front stops at $X = 2597$ m

..... Front speed (max = 31.9 m/s)

- - - - - Mean speed (max = 34.9 m/s)

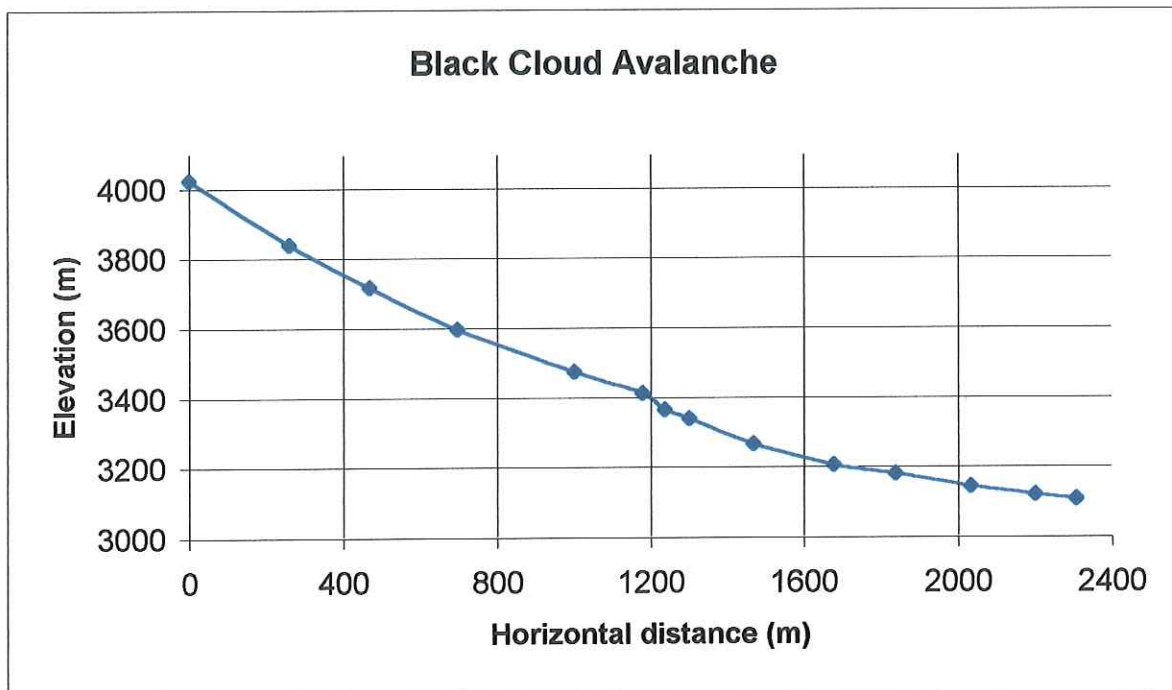
_____ Deposition (not to scale)

Exit and view distributions
in your file c:\plk\results.txt

Avalanche Profile and x/y coordinates

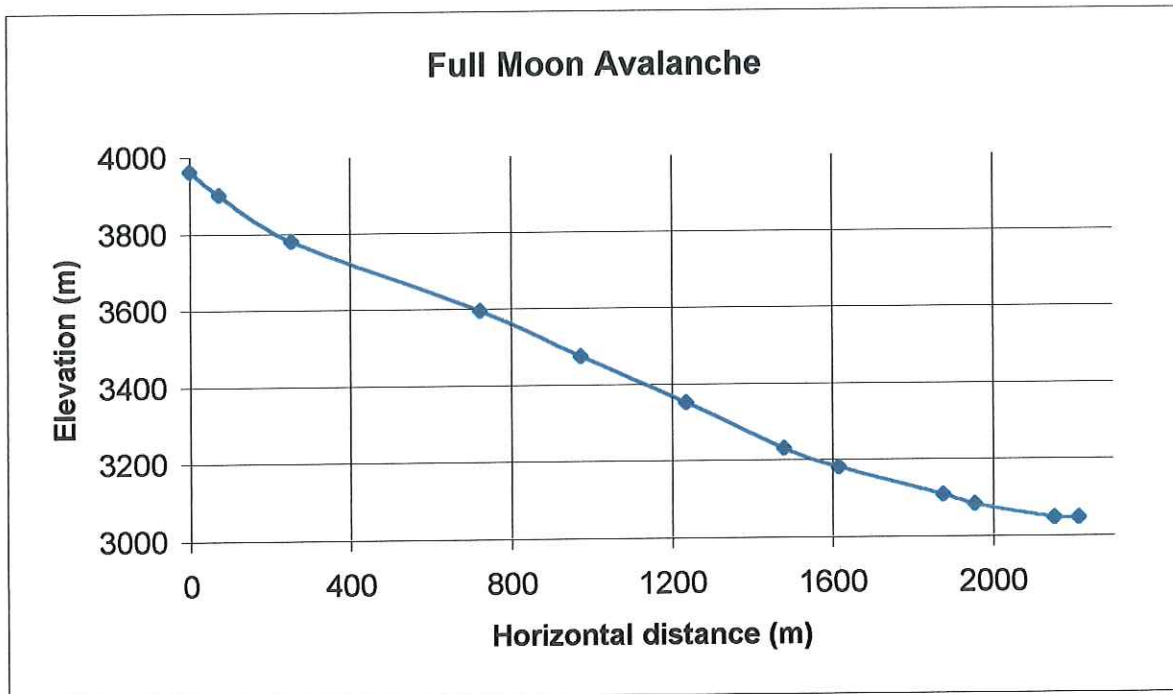
Black Cloud

Raw Data in feet		Data in meters		Segment Data			
X-feet	Y-feet	X-meters	Y-meters	L-meters	Ang - Deg	Sum L	Avg Angle
0	13200	0	4024			0	
850	12600	259	3841	317	35.2	317	35.2
1540	12200	470	3720	243	30.1	560	33.0
2290	11800	698	3598	259	28.1	820	31.4
3280	11400	1000	3476	326	22.0	1145	28.8
3870	11200	1180	3415	190	18.7	1335	27.3
4060	11040	1238	3366	76	40.1	1411	28.0
4270	10960	1302	3341	69	20.9	1479	27.7
4820	10720	1470	3268	183	23.6	1662	27.2
5500	10520	1677	3207	216	16.4	1878	26.0
6020	10440	1835	3183	160	8.7	2039	24.6
6670	10320	2034	3146	202	10.5	2240	23.4
7220	10240	2201	3122	169	8.3	2410	22.3
7570	10200	2308	3110	107	6.5	2517	21.6



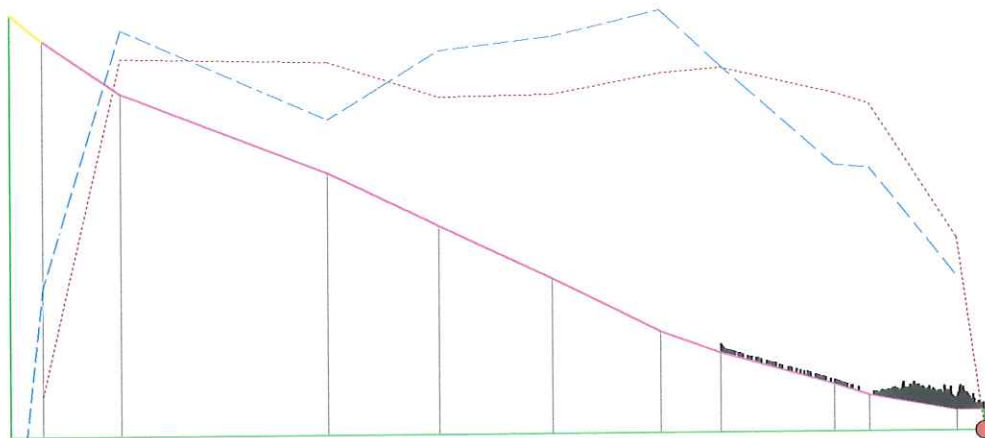
Avalanche Profile and x/y coordinates Full Moon

Raw Data in feet		Data in meters		Segment Data			Avg Angle
X-feet	Y-feet	X-meters	Y-meters	L-meters	Ang - Deg	Sum L	
0	13000	0	3963			0	
240	12800	73	3902	95	39.8	95	39.8
830	12400	253	3780	217	34.1	313	35.9
2370	11800	723	3598	504	21.3	816	26.9
3200	11400	976	3476	281	25.7	1097	26.6
4050	11000	1235	3354	286	25.2	1384	26.3
4850	10600	1479	3232	273	26.6	1656	26.3
5300	10440	1616	3183	146	19.6	1802	25.8
6150	10200	1875	3110	269	15.8	2071	24.5
6410	10120	1954	3085	83	17.1	2154	24.2
7060	10000	2152	3049	202	10.5	2356	23.0
7260	10000	2213	3049	61	0.0	2417	22.5



475 particles start from top segment.

2785 particles deposited.



c:\plk\Full Moon.txt

Path drops: 913 m

Friction $\mu = 0.25$

$\log M/D = 2.75$

Random R = 0.300

Alpha = 22.4 degrees

● Front stops at X = 2211 m

..... Front speed (max = 28.0 m/s)

----- Mean speed (max = 31.4 m/s)

_____ Deposition (not to scale)

Exit and view distributions
in your file c:\plk\results.txt

AVALANCHE MAPPING AND HAZARD ANALYSIS

OPHIR TOWNSITE

SAN MIGUEL COUNTY, COLORADO

Prepared For

Mr. Glen Pauls

Prepared By,

Arthur I. Mears, P.E., Inc.

Gunnison, Colorado

January, 2005

AVALANCHE MAPPING AND HAZARD ANALYSIS

OPHIR TOWNSITE

SAN MIGUEL COUNTY, COLORADO

Prepared For

Mr. Glen Pauls

Prepared By,

Arthur I. Mears, P.E., Inc.
Gunnison, Colorado
January, 2005

Arthur I. Mears, P. E., Inc.
Natural Hazards Consultants
555 County Road 16
Gunnison, CO 81230
Tel/Fax: (970) 641-3236

January 25, 2005

Mr. Glenn Pauls
Box 426
Placerville, CO 81430

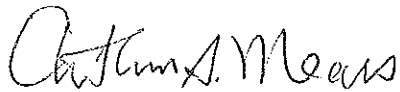
Dear Mr. Pauls:

The attached mapping and evaluation of avalanche hazard within the Ophir Townsite, San Miguel County, Colorado area has been prepared as we discussed last month.

The report consists of two parts: (a) the text portion, and (b) the avalanche map, which is separate from the text.

Please contact me if you have any questions.

Sincerely,

A handwritten signature in cursive script that reads "Arthur I. Mears".

Arthur I. Mears, P.E.
Avalanche-control engineer

Encl.

1 OBJECTIVES AND LIMITATIONS

This report, as requested by Mr. Glenn Pauls during our meeting in December, 2004 has the following **objectives**:

- a. Mapping of design-magnitude¹ avalanche areas within and immediately adjacent to Ophir;
- b. Computation of the dynamics and destructive potential of these avalanches; and
- c. Subdivision of the lower track and runout zones into “red” (high hazard) and “blue” (moderate hazard) zones.

The report also has the following **limitations**, which must be understood by all those relying on the results:

- a. This report evaluates avalanche potential during current forest cover conditions; widespread timber clearing by natural (e.g., forest fire) or man-caused conditions could increase avalanche potential;
- b. Even larger avalanches (e.g. 300 or 1000-year return period events) could occur and exceed the sizes mapped;
- c. Numerous avalanches occur in the Ophir valley outside the limits studied for this report; these have not been mapped; and
- d. This report is not complete without the detailed topographic map which accompanies it.

2 TERRAIN, HISTORY AND DESIGN-MAGNITUDE AVALANCHES

2.1 Terrain and history

The terrain within the study area is shown on Figure 1, a 1:12,000-scale (1" = 1,000') topographic map based on U. S. Geological Survey data and aerial photography taken in 1951. The Ophir Town boundaries are shown, approximately, on this map. The purpose of Figure 1 is to provide an overview of the topography and avalanches from Spring Gulch, Staatsburg Basin and adjacent slopes which affect Ophir. *Avalanche boundaries shown are approximate.* Refer to the large-scale topographic map accompanying this report for details.

The Ophir valley is a glacially-eroded “U-shaped” valley. It encompasses roughly 4,000 vertical feet, from 9,500 feet west of Ophir to 13,500 feet at the higher peaks. The Spring

¹ Design-magnitude avalanche – In San Miguel County, this avalanche is the largest and most destructive event expected in approximately 100 years and must be considered in land-use planning and engineering. The true return period of such an event is difficult to determine precisely, therefore may lie between 30 and 300 years. Some jurisdictions in Colorado (e.g. Gunnison and Pitkin Counties) and elsewhere (Switzerland, Norway, Iceland) require that the 300-1000 year event be considered.

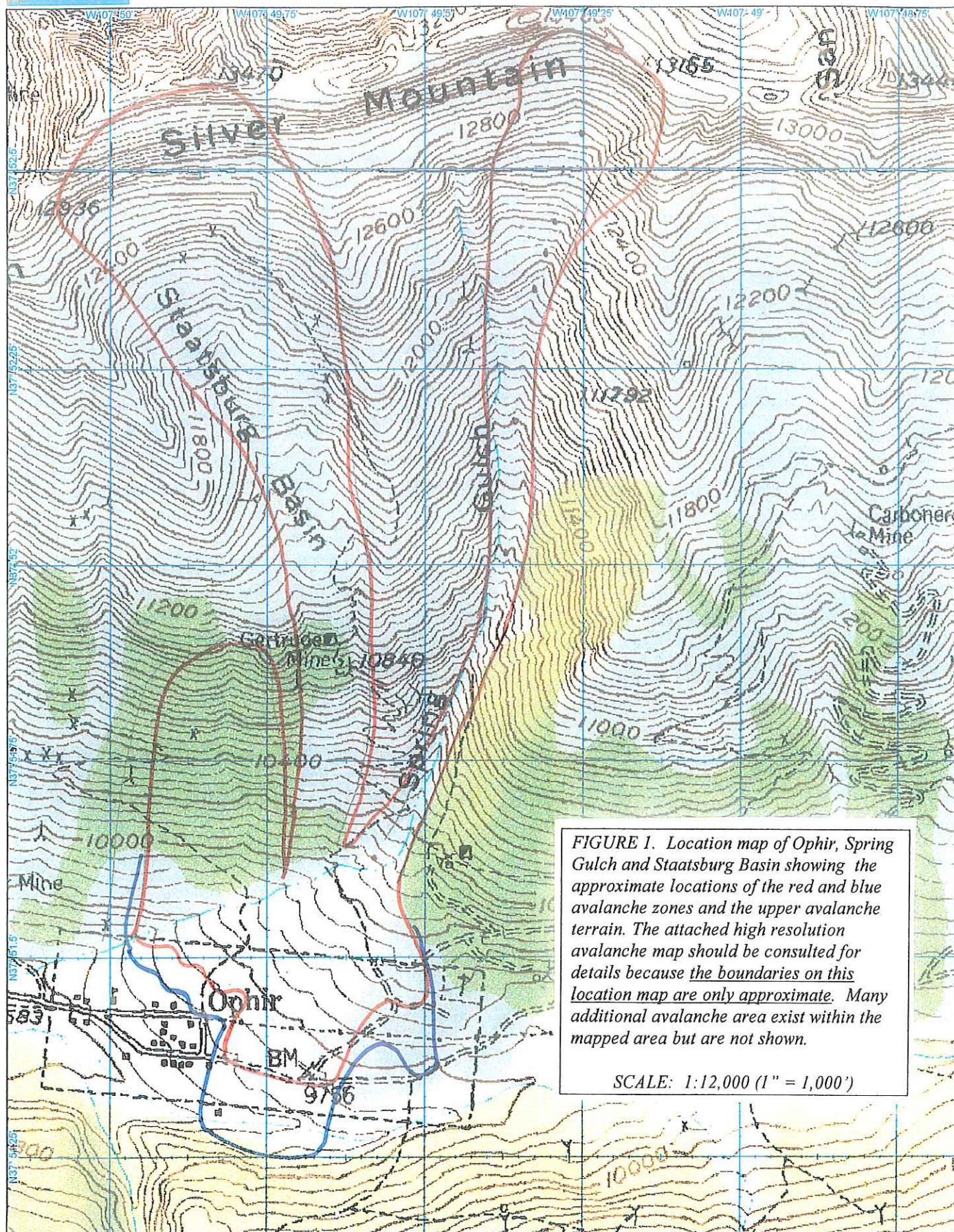
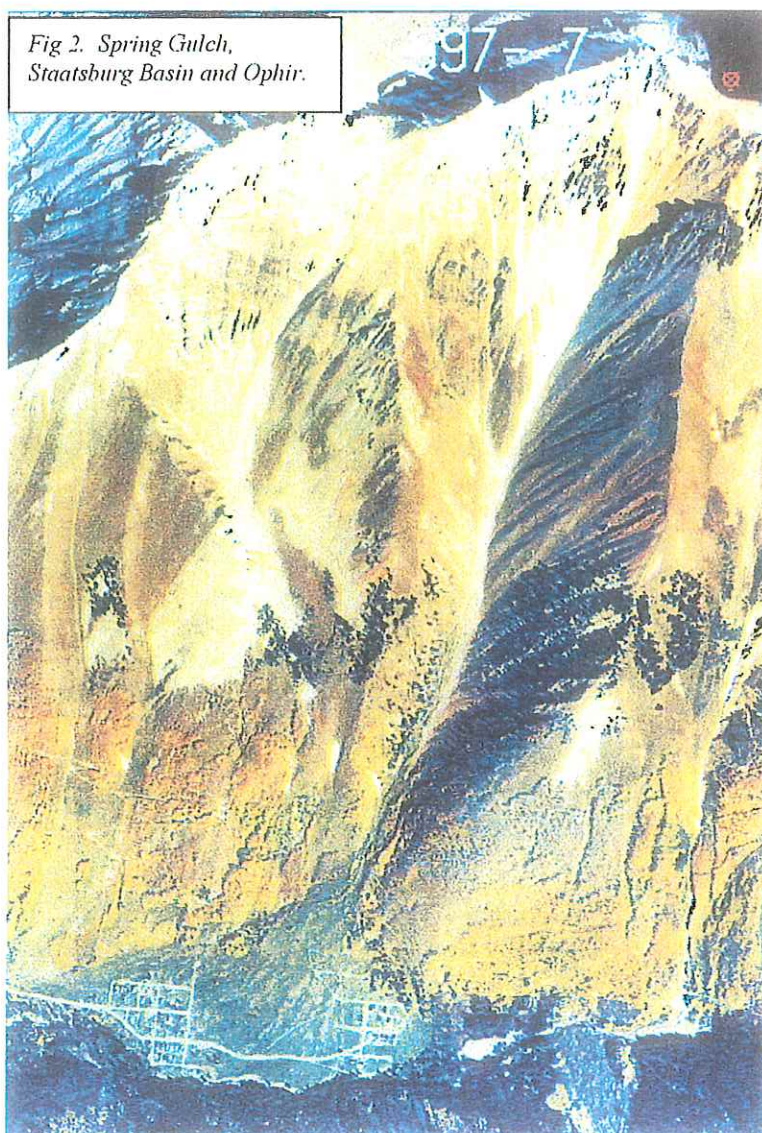


FIGURE 1. Location map of Ophir, Spring Gulch and Staatsburg Basin showing the approximate locations of the red and blue avalanche zones and the upper avalanche terrain. The attached high resolution avalanche map should be consulted for details because the boundaries on this location map are only approximate. Many additional avalanche area exist within the mapped area but are not shown.

SCALE: 1:12,000 (1" = 1,000')

Gulch drainage begins at 13,300 feet and ends at the Howard Fork (Figure 1). Staatsburg Basin also begins at a similar elevation and joins Spring Gulch at 10,000 feet. The higher terrain (generally above 11,500 feet) averages greater than 30° inclination and is mostly above timberline. The area receives relatively heavy snowfall and strong winds during many snow seasons, a period that can last from November through May. The combination of steep terrain, numerous open slopes devoid of trees that would anchor the snowpack, and occasional heavy, windy snowstorms can and have produced large snow avalanches. Figure 2 is a U. S. Forest Service aerial photograph of Spring Gulch, Staatsburg Basin and Ophir, showing the tributary drainages that have produced snow avalanches.



*Fig 2. Spring Gulch,
Staatsburg Basin and Ophir.*

Historic evidence also exists for large avalanches within and near Ophir. For example, a large dry-snow avalanche beginning in Spring Gulch (perhaps Staatsburg Basin) completely crossed the alluvial fan upon which the Town of Ophir is located and impacted trees on the south side of the Howard Fork as recently as the 1950's, approximately. Trees within the impact area from this avalanche are missing limbs 20-30 feet above ground level. The impact area has been re-colonized by smaller, younger trees but the resulting scar in the forest is clearly visible today. Wet-snow avalanches from Spring Gulch have reached and moved houses in Ophir at various times since Ophir was founded in the late 19th century and the road between Ophir Loop and Ophir is blocked by

large avalanches from both north and south sides of the valley every few years. During a March, 2004 storm a moderately large dry-snow avalanche from Spring Gulch reached the northern portion of the Ophir town limits damaging the electrical transmission line.

Widespread avalanches also occurred in January, 2005 throughout the San Juan Mountains, including the Ophir valley.

2.2 Determination of the design-avalanche limits at Ophir

Although inspection of terrain and forest cover provides, in many cases, evidence of design avalanche extent and frequency it does not provide quantitative information on avalanche destructive energy, or impact-pressure potential². Furthermore, avalanches apparently have not been as large as possible in Spring Gulch or Staatsburg Basin in recent decades even though the avalanche paths areas are large and can release large snow volumes. Because of the lack of data the design-avalanche characteristics must be computed. Computational methods are described in some detail in Colorado Geological Survey Bulletin #49³. In the current study the following 2-step procedure was used:

1. Step 1 – The *stopping position* of the design avalanche was determined in the field and on maps through inspection of damage and destruction to the forest, by geomorphic evidence of avalanche extent, and were computed through use of regression analysis based on a Colorado database of large avalanches.
2. Step 2 – After the stopping position was determined, an *avalanche-dynamics model* was used to match that stopping position and predict avalanche speeds and impact-pressure potentials.

In order to apply recent methodology, the Swiss avalanche-dynamics model AVAL-1D was used to compute velocity and impact-pressure potentials. Examples of the computational techniques are provided in the technical appendix.

3 RED AND BLUE HAZARD ZONES AND LAND USES

In accordance with customary practice used in San Miguel County, elsewhere in Colorado and in selected jurisdictions within the United States⁴ avalanche-hazard zones for land-use or engineering purposes are defined as follows:

1. Red Zone (high hazard) – Avalanches in the red zone have (a) return periods of 30 years or less (annual probabilities of 1/30 or about 3% or more), or (b) produce impact pressures of 600 lbs/ft² or more, or both “a” and “b.” Residential construction in the red zone is usually prohibited because of the engineering difficulties associated with mitigation design for large forces or

² Both impact pressure potential *and* frequency are needed to determine hazard zones (the “red” and “blue” zones), as discussed in Section 3.

³ Mears, A. I., 1992, Snow Avalanche Hazard Analysis for Land-Use Planning and Engineering, Colorado Geological Survey Bulletin #49, 82 p.

⁴ Hazard-zone definitions and permitted land uses within hazard zones differ from one location to another within the United States because they reflect local (county or municipal) ordinances. National standards do not exist.

because human occupancy of high-frequency red zones results in undesirably high level of exposure to the hazard.

2. Blue Zone (moderate hazard) – Avalanches here have (a) return periods of 30 to 100 years⁵ (constant annual probabilities of about 3% to 1%) *and* (b) produce impact pressures *of less than* 600 lbs/ft². Both conditions “a” and “b” must be satisfied or the area is defined as a red zone. Residential construction may be permitted in a blue zone if engineered mitigation is used to protect property and reduce risk to an acceptable level.

The outer limits of the blue zone defines the design-avalanche limits. A “white zone” exists beyond the design avalanche. This is an area where avalanche hazard is considered to be sufficiently small to be disregarded in zoning and land-use regulation.

4 MODIFICATIONS TO PREVIOUS AND CURRENT AVALANCHE MAPS

The current avalanche map (accompanying this study) differs somewhat from previous mapping for the following reasons:

- a. Detailed topographic base map. The detailed base map of the Ophir area that accompanies this study has a very high level of topographic detail (Scale – 1” = 100’; 2-foot contour intervals). Therefore the map displays ground features to a high level of precision; these affect flowing snow direction. These details, features and ground irregularities enable more accurate mapping of the runout zone. This is particularly important near the end of the runout where speeds decrease, particularly in wet-snow avalanches.
- b. Use of updated avalanche-dynamics model. As noted in Section 2 of this report, an updated Swiss model of avalanche dynamics was applied in this study. This model, which has been calibrated to both European and Colorado (which differ from those in Europe) snow and avalanche conditions, enable flow widening and resulting flow depth decrease to be considered in the dynamics analysis.

Although I feel the best available methods have been used in the preparation of this study and map, no claim can be made that the results are “perfect.” Definition of the return period of the design (“100-year”) event is probably only correct to within a factor of two or three. Therefore the “real” return period of the design event probably lies between 50 and 200 years, or possibly between 30 and 300 years. A better estimate cannot be made with the available data.

Finally, no avalanche map should be considered “static,” or invulnerable to future revisions. If accurate and reliable historical records of past avalanche effects, characteristics, or areas reached by avalanches become available, they should be

⁵ Some jurisdictions in the United States, Canada, and Europe require the blue zone to extend to the 300-year avalanche limits. This is a more conservative (safer) requirement than that used in this study.

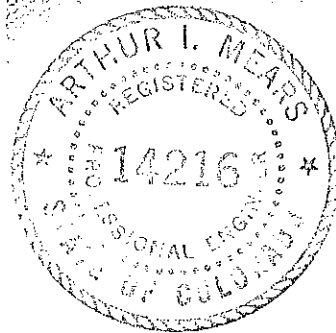
incorporated into the mapping if they *increase* the size of the avalanche area. However, it is important to understand that *lack* of historical data concerning effects at a given point should not be used to refute the mapping. In other words, if a certain area which is currently mapped as lying within the red or blue zone has no record of previous avalanche activity, this area should not be deleted from the avalanche area. Historical records are notoriously incomplete, imprecise or inaccurate. Furthermore, when viewed from a statistical perspective, a very long period of continuous history (approximately 300 years) would be needed in order to define the 100-year avalanche limits with a 95% confidence. Such historical records do not exist at Ophir or any other areas within the Western United States. This is one of the primary reason why indirect computational methods, such as those used in this study, must be applied.

Please contact me if you have any questions.

Report prepared by,

Arthur I. Mears

Arthur I. Mears, P.E.
Avalanche-control engineer



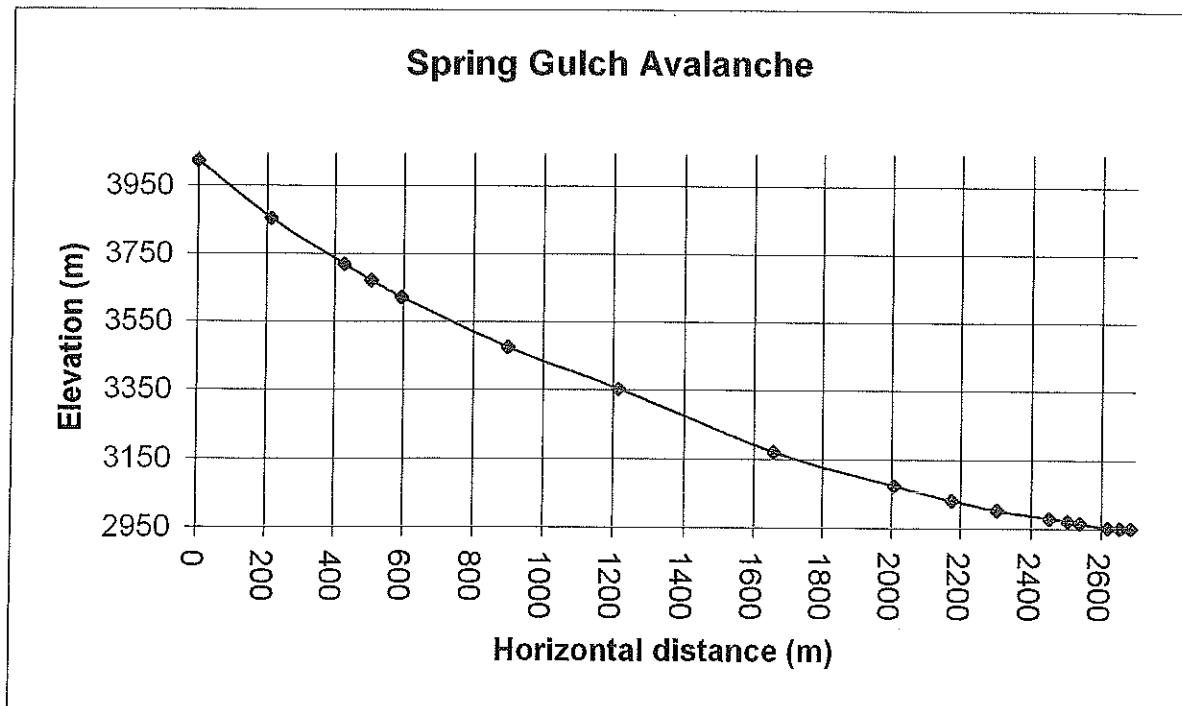
TECHNICAL APPENDIX

This technical appendix consists of two sections: (a) a detailed avalanche path profile broken down into several profile segments and the topographic parameters (length, vertical angle, horizontal and vertical distances) within each segment and (b) the maximum pressure potentials along the path for the 100-year and 30-year avalanche, as calculated by the Swiss avalanche-dynamics model AVAL-1D. These computations were used to evaluate impact-pressure potentials for Red and Blue hazard-zone definitions.

Avalanche Profile and x/y coordinates

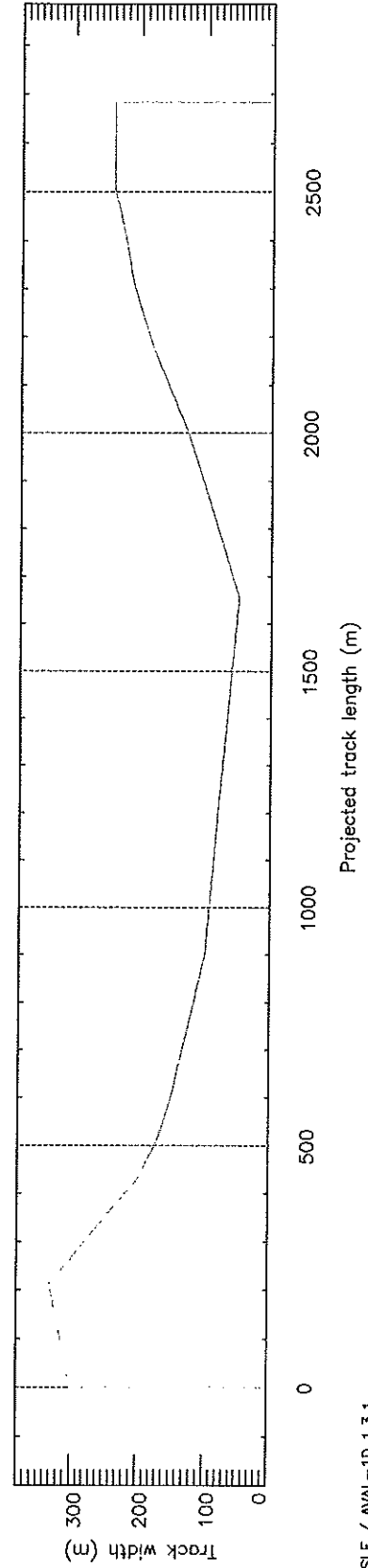
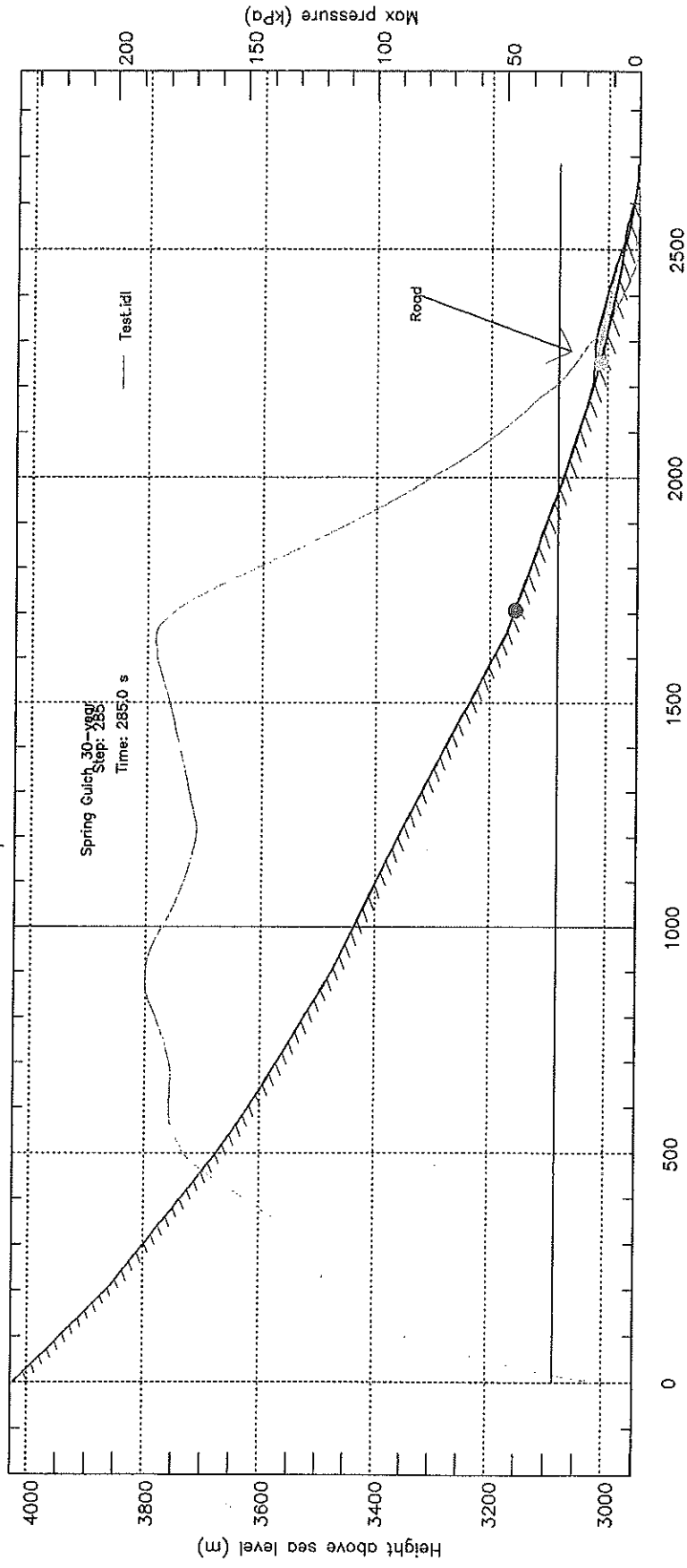
Spring Gulch

Raw Data in feet		Data in meters		Segment Data			
X-feet	Y-feet	X-meters	Y-meters	L-meters	Ang - Deg	Sum L	Avg Angle
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700	12640	213	3854	273	38.7	273	38.7
1400	12200	427	3720	252	32.2	525	35.5
1660	12040	506	3671	93	31.6	618	34.9
1950	11880	595	3622	101	28.9	719	34.1
2950	11400	899	3476	338	25.6	1058	31.4
3980	11000	1213	3354	337	21.2	1394	28.9
5430	10400	1655	3171	478	22.5	1873	27.3
6580	10080	2006	3073	364	15.5	2237	25.4
7130	9940	2174	3030	173	14.3	2410	24.6
7550	9850	2302	3003	131	12.1	2541	23.9
8040	9770	2451	2979	151	9.3	2692	23.1
8210	9750	2503	2973	52	6.7	2744	22.8
8325	9730	2538	2966	36	9.9	2780	22.6
8585	9690	2617	2954	80	8.7	2860	22.2
8700	9680	2652	2951	35	5.0	2895	22.0
8800	9680	2683	2951	30	0.0	2926	21.8



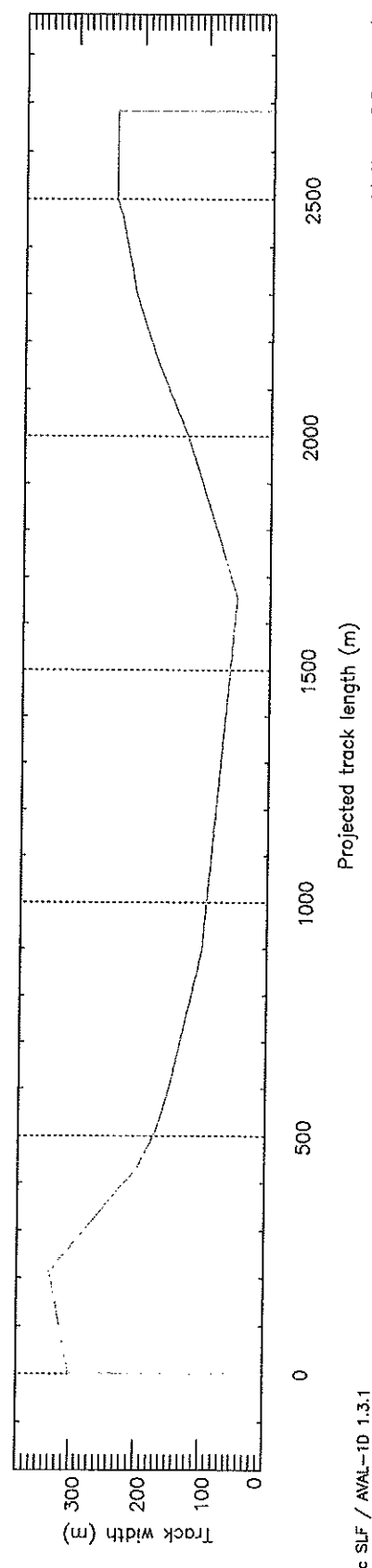
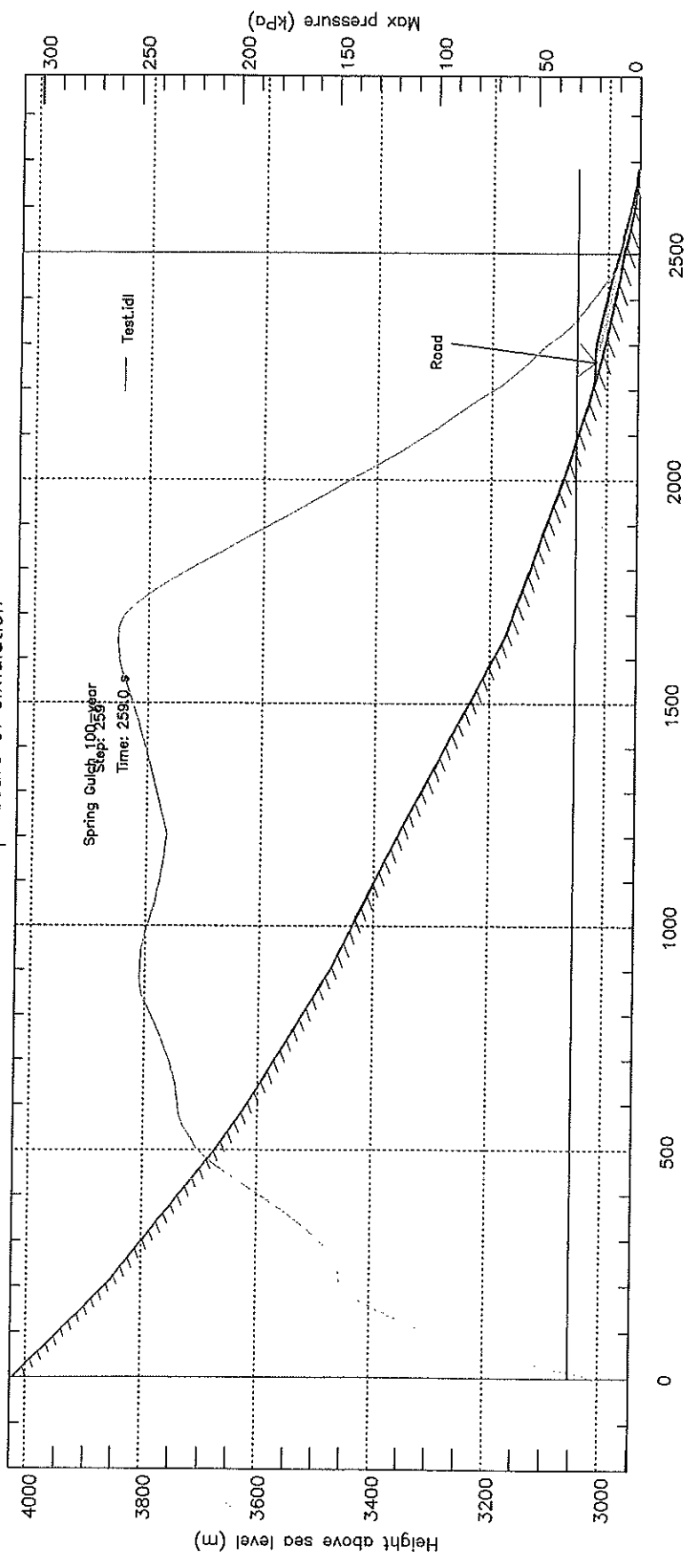
3047
3048
3049

Maximal pressure of simulation



570350
470460

Maximal pressure of simulation





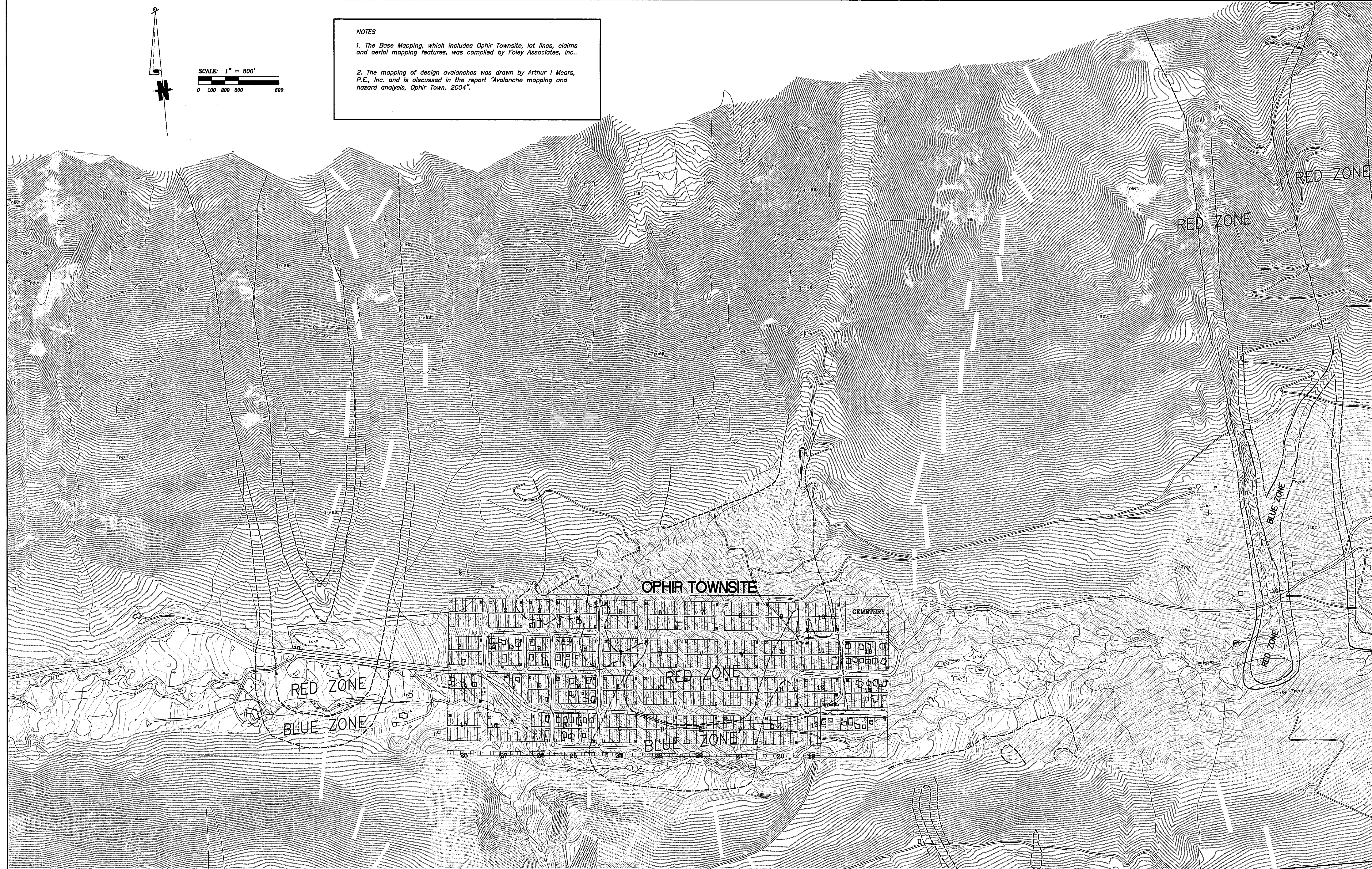
SCALE: 1" = 300'

0 100 200 300 400

NOTES

1. The Base Mapping, which includes Ophir Townsite, lot lines, claims and aerial mapping features, was compiled by Foley Associates, Inc..

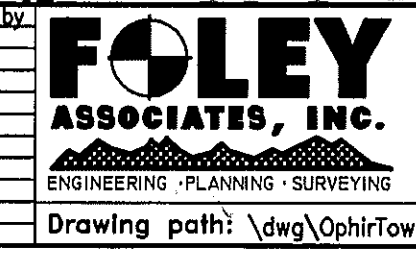
2. The mapping of design avalanches was drawn by Arthur I Mears, P.E., Inc. and is discussed in the report "Avalanche mapping and hazard analysis, Ophir Town, 2004".



AVALANCHE MAPPING FOR OPHIR, COLORADO 2004

MAPPING PROVIDED BY THE PAULS FAMILY

Project Mgr: DF	Rev:	description	date	by
Technician: JH				
Checked by:				
Start date: 3-16-04				



970-728-6153 970-728-6050 fax
P.O. BOX 1385
125 W. PACIFIC, SUITE B-1
TELLURIDE, COLORADO 81435

Drawing path: \\dwg\OphirTown-hazards
Sheet1 of 1 Project #: 01158

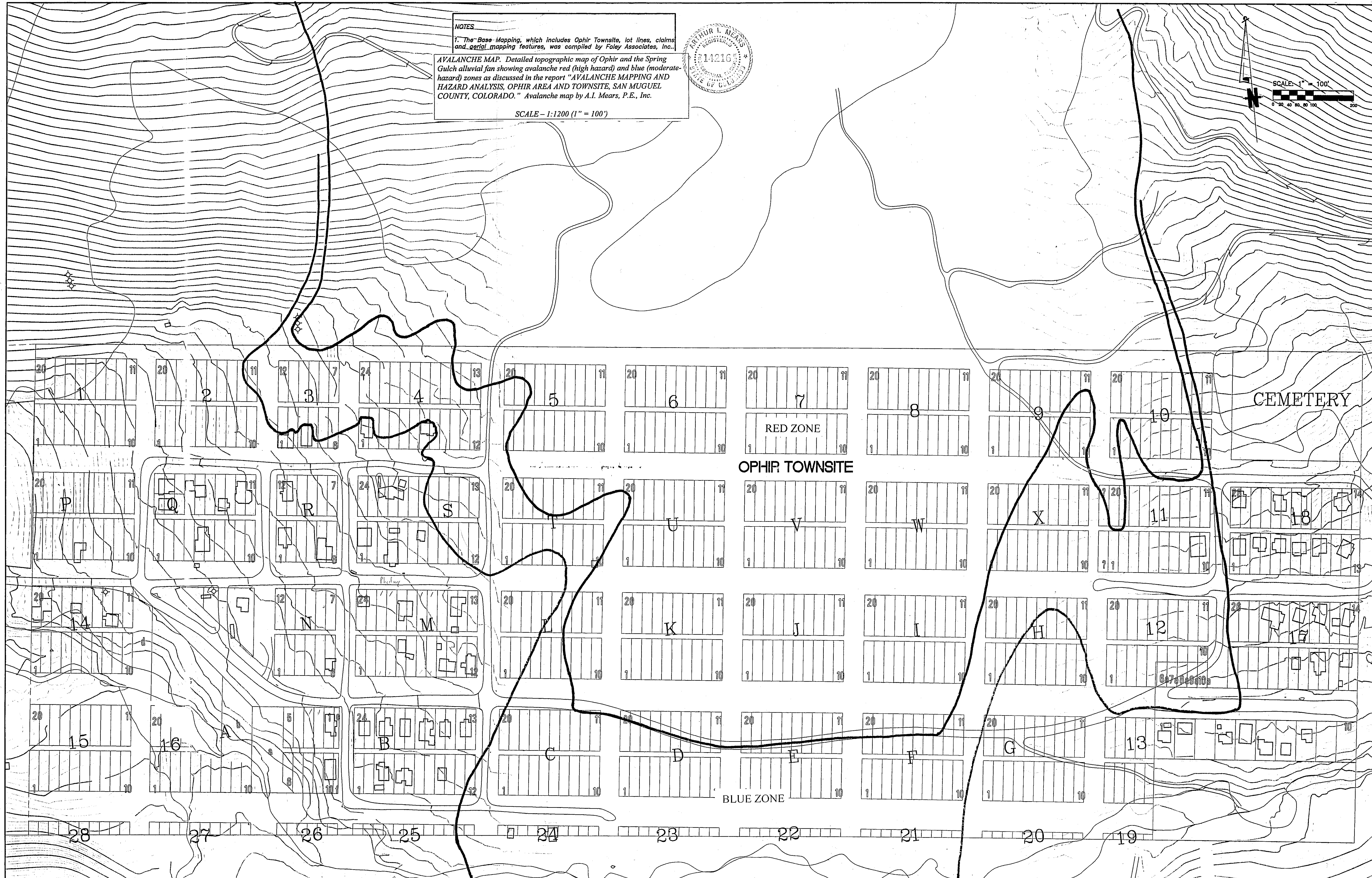
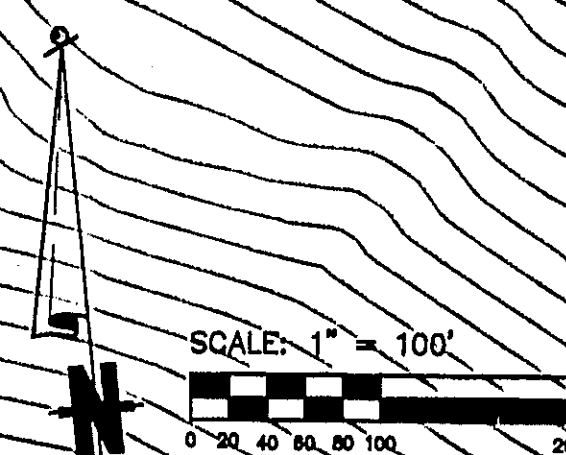
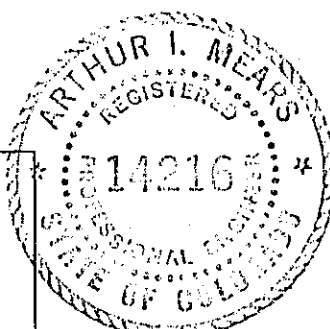
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NOTES

1. The Base Mapping, which includes Ophir Township, lot lines, claims and aerial mapping features, was compiled by Foley Associates, Inc.

AVALANCHE MAP. Detailed topographic map of Ophir and the Spring Gulch alluvial fan showing avalanche red (high hazard) and blue (moderate hazard) zones as discussed in the report "AVALANCHE MAPPING AND HAZARD ANALYSIS, OPHIR AREA AND TOWNSHIP, SAN MUGUEL COUNTY, COLORADO." Avalanche map by A.I. Mears, P.E., Inc.

SCALE - 1:1200 (1" = 100')



AVALANCHE MAPPING FOR OPHIR, COLORADO 2004

MAPPING PROVIDED BY THE PAULS FAMILY

Project Mgr:	DF	Rev.	Description	Date	By
Technician:	JH				
Checked by:					
Start date:	3-16-04				

FOLEY
ASSOCIATES, INC.
ENGINEERING • PLANNING • SURVEYING

970-728-6153 970-728-6050 fax
P.O. BOX 1385
125 W. PACIFIC, SUITE B-1
TELLURIDE, COLORADO 81435

Drawing path: \dwg\OphirTown-hazards

Sheet 1 of 1 Project #: 01158

Time Entries

Stephen B. Johnson Law Firm P.C.

Professional = All (Active Only)
 Group By Professional Group
 Client - Matter = 10341.11 Cornwall - Whittaker
 Property (Active Only)
 Task Code = All
 View = Original
 From 09-01-2014 To 10-31-2022

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10341.11 Cornwall - Whittaker Property										
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01-26-2022	Billed		Billable	Legal Services	Johnson, Stephen B.			0.800	325.00	260.00
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Time Entries

Stephen B. Johnson Law Firm P.C.

Professional = All (Active Only)
 Group By Professional Group
 Client - Matter = 10341.11 Cornwall - Whittaker
 Property (Active Only)
 Task Code = All
 View = Original
 From 09-01-2014 To 10-31-2022

Date	Status	Approval	BillableType	Task	Professional	Start	Stop	Duration	Rate	Amount
<u>Town of Ophir c/o Town Manager</u>										
<u>10341.11 Cornwall - Whittaker Property</u>										
05-23-2022	Billed		Billable	Legal Services	Johnson, Stephen B.			1.200	325.00	390.00
05-28-2022	Approved		Billable	Legal Services	Johnson, Stephen B.			0.200	325.00	65.00
06-10-2022	Approved		Billable	Legal Services	Johnson, Stephen B.			0.300	325.00	97.50
06-15-2022	Approved		Billable	Legal Services	Johnson, Stephen B.			0.500	325.00	162.50
06-21-2022	Approved		Billable	Legal Services	Johnson, Stephen B.			0.200	325.00	65.00
06-30-2022	Approved		Billable		Johnson, Stephen B.			0.400	350.00	140.00
07-03-2022	Billed		Billable		Johnson, Stephen B.			1.200	325.00	390.00
07-05-2022	Billed		Billable	Legal Services	Johnson, Stephen B.			1.400	325.00	455.00
07-05-2022	Billed		Billable	Legal Research	Johnson, Stephen B.			1.200	325.00	390.00
07-05-2022	Billed		Billable	Legal Research	Johnson, Stephen B.			0.300	325.00	97.50
07-05-2022	Billed		Billable	Legal Services	Johnson, Stephen B.			0.400	325.00	130.00
07-05-2022	Billed		Billable	Legal Services	Johnson, Stephen B.			0.500	325.00	162.50
07-05-2022	Billed		Billable	Legal Services	Johnson, Stephen B.			1.500	325.00	487.50
07-05-2022	Billed		Billable	Legal Services	Johnson, Stephen B.			1.300	325.00	422.50
07-07-2022	Billed		Billable	Legal Services	Johnson, Stephen B.			0.400	325.00	130.00
07-07-2022	Billed		Billable	Legal Services	Johnson, Stephen B.			2.000	120.00	240.00
07-07-2022	Billed		Billable	Legal Services	Johnson, Stephen B.			1.500	240.00	360.00

Time Entries

Stephen B. Johnson Law Firm P.C.

Professional = All (Active Only)
 Group By Professional Group
 Client - Matter = 10341.11 Cornwall - Whittaker
 Property (Active Only)
 Task Code = All
 View = Original
 From 09-01-2014 To 10-31-2022

Date	Status	Approval	BillableType	Task	Professional	Start	Stop	Duration	Rate	Amount
Town of Ophir c/o Town Manager										
10341.11 Cornwall - Whittaker Property										
07-08-2022	Billed		Billable	Legal Services	Johnson, Stephen B.			0.300	325.00	97.50
07-08-2022	Billed		Billable	Legal Services	Johnson, Stephen B.			0.100	325.00	32.50
07-08-2022	Billed		Billable	Legal Services	Johnson, Stephen B.			0.200	350.00	70.00
07-11-2022	Billed		Billable	Legal Services	Johnson, Stephen B.			0.400	350.00	140.00
07-11-2022	Billed		Billable	Legal Services	Johnson, Stephen B.			0.500	325.00	162.50
07-12-2022	Billed		Billable	Legal Services	Johnson, Stephen B.			0.400	325.00	130.00
07-13-2022	Billed		Billable	Legal Services	Johnson, Stephen B.			0.100	325.00	32.50
07-26-2022	Billed		Billable	Legal Services	Johnson, Stephen B.			0.400	325.00	130.00
08-01-2022	Billed		Billable	Legal Services	Johnson, Stephen B.			0.200	325.00	65.00
08-02-2022	Billed		Billable	Legal Services	Johnson, Stephen B.			0.500	325.00	162.50
08-03-2022	Billed		Billable	Legal Services	Johnson, Stephen B.			0.200	325.00	65.00
08-26-2022	Billed		Billable	Legal Services	Johnson, Stephen B.			0.300	325.00	97.50
08-29-2022	Billed		Billable	Legal Services	Johnson, Stephen B.			0.200	325.00	65.00
08-30-2022	Billed		Billable	Legal Services	Johnson, Stephen B.			0.000	325.00	0.00
09-08-2022	Billed		Billable	Legal Services	Johnson, Stephen B.			0.200	325.00	65.00
09-10-2022	Billed		Billable	Legal Services	Johnson, Stephen B.			0.400	325.00	130.00

Time Entries

Stephen B. Johnson Law Firm P.C.

Professional = All (Active Only)
 Group By Professional Group
 Client - Matter = 10341.11 Cornwall - Whittaker
 Property (Active Only)
 Task Code = All
 View = Original
 From 09-01-2014 To 10-31-2022

Date	Status	Approval	BillableType	Task	Professional	Start	Stop	Duration	Rate	Amount
<i>Town of Ophir c/o Town Manager</i>										
<i>10341.11 Cornwall - Whittaker Property</i>										
09-13-2022	Billed		Billable	Legal Services	Johnson, Stephen B.			0.300	325.00	97.50
09-14-2022	Billed		Billable	Legal Services	Johnson, Stephen B.			1.800	325.00	585.00
09-14-2022	Billed		Billable	Legal Services	Johnson, Stephen B.			1.300	325.00	422.50
								Matter Total	31.600	9,630.00
								Client Total	31.600	9,630.00
								Grand Total	31.600	9,630.00

NOTICE

Of Pending Official Town of Ophir Hazard Map Amendment

Project Name: Cornwall Property

Project Summary: The evaluation of avalanche hazard and mapping within lots 1-10, block two. Article 804 overlay adjustment, Appendix C Town of Ophir Hazards Map.

Action Sought: Removal of lots 1-10, block two from the high hazard area designation on the Town of Ophir Hazards Map.

Legal Description: Lots 1-10, Block Two, Town of Ophir, Colorado

Address: TBD Aurum Street

Owner and Applicant: Joyce Whitaker, David Cornwall

Authorized Agent: Joseph Waller, joseph@josephwaller.com

COMPLETE INFORMATION REGARDING THE APPLICATION IS AVAILABLE AT THE
OPHIR TOWN HALL, 36 PORPHYRY ST. (970) 728-4943

General Assembly Meeting

DATE OF HEARING: November 15, 2022

LOCATION: OPHIR TOWN HALL, 36 PORPHYRY ST

RECOMMENDATION MAKING BODY: GENERAL ASSEMBLY

AFFIDAVIT

Before the General Assembly of the Town of Ophir, Colorado:

Project Name: Cornwall Property

Project Summary: The evaluation of avalanche hazard and mapping within lots 1-10, block two, Article 804 overlay adjustment, Appendix C Town of Ophir Hazards Map.

Legal Description: Lots 1-10, Block Two, Town of Ophir, Colorado

Address: NA

Owner: Joyce Whitaker, David Cornwall

Applicant: Joseph Waller

AFFIDAVIT OF (Name)

Kristin Frøberg Kristin Frøberg

The undersigned, being first duly sworn, states and declares as follows:

1. That upon examination of a scaled map of the Town of Ophir, I determined which properties are within two hundred feet, exclusive of streets and alleys, of the property which is the subject of this affidavit; and
2. That upon examination of the public records of the office of the San Miguel County Assessor, I verified the owners of record of property within two hundred feet of the property which is the subject of this affidavit; and
3. Being duly authorized, I placed a true and accurate copy of the Notice of Public Hearing addressed to the property owners of record which I verified to be within two hundred feet of the subject property, a copy of which is attached hereto and incorporated herein by this reference, in the United States Mail, first class postage prepaid on the 11th day of October, 2022 to individual homeowners or by hand-delivery so long as such delivery is accomplished by leaving notice with an adult property owner at least ten (10) days prior to the public hearing
4. Being duly authorized, I posted Notice of Public Hearing consisting of a sturdily mounted poster at least 24" x 36" in size at a conspicuous location on the subject property at least ten (10) days prior to the public hearing.

FURTHER AFFIANT SAYETH NOT.

Kristin Frøberg
Signature

STATE OF COLORADO)

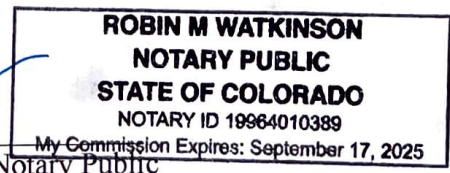
) ss.

COUNTY OF SAN MIGUEL)

The foregoing declaration was sworn to before me this 12th day of October, 2022
by Kristin Frøberg.

WITNESS my hand and official seal.

My commission expires: 9/17/25



Notary Public

NOTICE OF PUBLIC HEARING BEFORE THE OPHIR GENERAL ASSEMBLY Whether to Approve a Rezoning Application

Notice is hereby given that on November 15, 2022 at 7:00 PM, or as soon as possible thereafter, in Ophir Town Hall, 36 Porphyry St., Ophir, Colorado, or at such other time and place as this hearing may be adjourned, a public hearing will be held to consider:

Project Name: Cornwall Property

Project Summary: The evaluation of avalanche hazard and mapping within lots 1-10, block two, Article 804 overlay adjustment, Appendix C Town of Ophir Hazards Map.

Action Sought: Removal of lots 1-10, block two from the high hazard area designation on the Town of Ophir Hazards Map and retaining underlying residential zoning.

Legal Description: Lots 1-10, Block Two, Town of Ophir, Colorado

Address: NA

Owner: Joyce Whitaker, David Cornwall

Applicant: Joseph Waller

More complete information is on file and available at Town Hall, 36 Porphyry, Ophir, CO. (970)728-4943.

NOTICE OF PENDING TOWN OF OPHIR HAZARD MAP AMENDMENT

October 09, 2022

RE: General Assembly Meeting

Dear Property Owner,

You are receiving this public notice as required by the Town of Ophir Land Use Code because you own property within 200 feet of a proposed Avalanche Hazard Map change. Notice is hereby given that on **November 15, 2022 at 7:00 PM**, or as soon as possible thereafter, in Ophir Town Hall, 36 Porphyry St., Ophir, Colorado, or at such other time and place as this hearing may be adjourned, a public hearing will be held to consider:

Project Name: Cornwall Property

Project Summary: The evaluation of avalanche hazard and mapping within lots 1-10, block two, Article 804 overlay adjustment, Appendix C Town of Ophir Hazards Map.

Action Sought: Removal of lots 1-10, block two from the high hazard area designation on the Town of Ophir Hazards Map.

Legal Description: Lots 1-10, Block Two, Town of Ophir, Colorado

Address: TBD Aurum Street

Owner and Applicant: Joyce Whitaker, David Cornwall

Authorized Agent: Joseph Waller, joseph@josephwaller.com

More complete information is on file and available at Town Hall, 36 Porphyry St., Ophir, CO. (970)728-4943. If you would like your concerns noted and reviewed prior to the hearing date, please forward your written comment letter to:

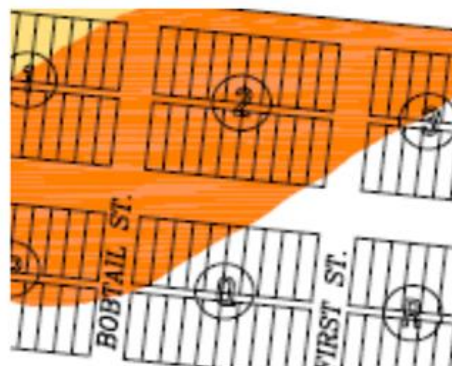
Town of Ophir
P.O. Box 683
Ophir, CO 81426

or

Email document attachment with an email owned by the commenting individual to:
clerk@ophir.us

or

Deliver in person to:
Ophir Town Hall at the physical address listed above.



To: Town of Ophir
From: Mike Kuby, 105 Aurum St.
Re: Objection to Cornwall Property Avalanche Hazards Map change
Date: October 25, 2022

I am writing on behalf of myself and Lauren to object to the proposed change in the Town of Ophir Avalanche Hazards Map to remove Lots 1-10 of Block 2 from the high hazard area designation.

Evidence that avalanches can reach these lots is apparent simply by looking in the meadow behind the Humphries, Kuby, and Cain homes on the north side of Aurum St. There you can see longitudinal debris flows coming down valley from Spring Gulch and ending behind these houses. These debris flows reach some of the lots in question and head directly towards the remaining lots further downhill. They are elevated several feet above the rest of the meadow. Given that mud and rock debris flows have reached these points in the past, it is likely that snow avalanches can go beyond the end of these flows to reach all of the lots in question.

Although I am a Full Professor in the School of Geographical Sciences and Urban Planning, my specialty is not in physical geography. I therefore do not claim to be an expert in avalanches or debris flows. With that in mind, I would like to submit the attached scientific paper as evidence for the common-sense claim that snow avalanches generally can run out farther downhill than debris flows. I believe you will find that the evidence and implication of the attached paper is very pertinent and easily understandable.

Decaulne, Armelle. "Snow-avalanche and debris-flow hazards in the fjords of north-western Iceland, mitigation and prevention." *Natural Hazards* 41.1 (2007): 81-98.

The attached paper includes maps that show the runouts of both snow avalanches and debris flows in the fjords of NW Iceland. The photographs in Figure 2 show U-shaped glacial slopes similar to those in Ophir, with buildings on the flat bottom of the slopes.

On the next page, I reproduce Figure 5 from this paper. I have added red arrows pointing to where the wide, light gray-colored runouts of the snow avalanches exceed the length of the narrow, dark gray runouts of the debris flows and reach the buildings also shown on the map.

While of course there are differences in landscape and climate between Ophir and the fjords of Iceland studied in this paper, I think that glacial landscapes around the world are similar enough to establish the likelihood that the snow avalanches in Ophir would also run out farther than debris flows, which we can plainly see have reached the lots behind our homes in the past. I believe one does not have to be an expert in geomorphology and avalanche science to interpret the attached map. The fact that this paper is motivated by the threat to buildings is another reason to heed its warning.

Thank you for taking our concerns and the information we have provided into consideration, and thank you all for the service you provide to the Ophir community.

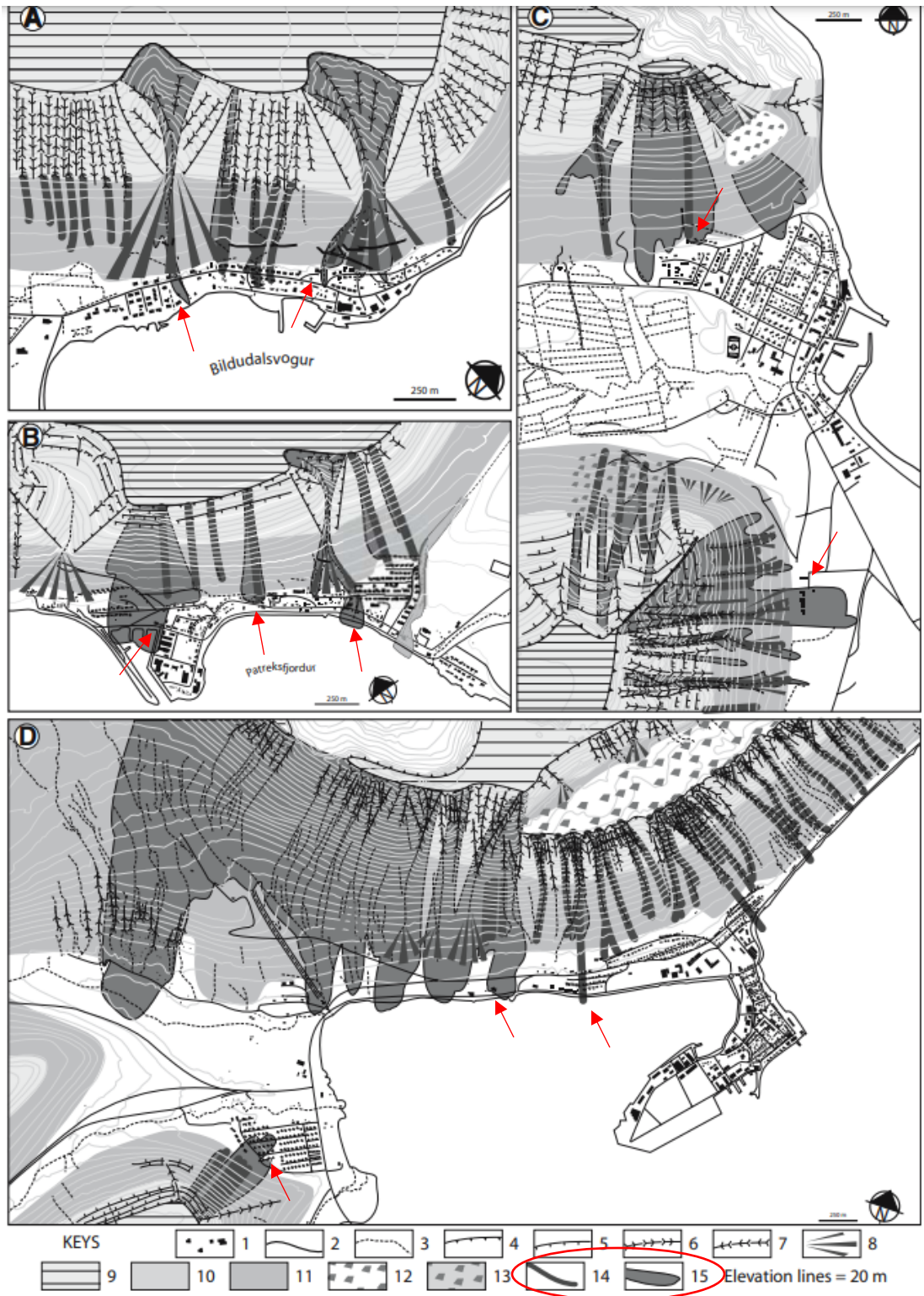


Fig. 5 Simplified geomorphological maps of the study areas of Bildudalur (A), Patreksfjörður (B), Bolungarvík (C) and Ísafjörður (D) showing the runout distance of documented and recognised in the field snow avalanches and debris flows. 1: buildings; 2: road; 3: brook; 4: cliff edge; 5: secondary cliff (<2 m high); 6: ridge; 7: gully; 8: large multi-process cone; 9: summital plateau; 10: bedrock outcrop; 11: talus; 12: boulder cover; 13: rockslide; 14: debris flow; 15: snow avalanche (including slush flows)

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/225328236>

Snow-avalanche and debris-flow hazards in the fjords of north-western Iceland, mitigation and prevention

Article in *Natural Hazards* · April 2007

DOI: 10.1007/s11069-006-9025-x

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Soutien de l'Agence Universitaire de la Francophonie (AUF) à l'organisation de l'école d'été doctorale "Méthodes dendrochronologiques, d'analyse des palynomorphes et documentaires utilisées dans la reconstitution des changements climatiques et environnementaux" [View project](#)



Étude des conditions météorologiques favorables au déclenchement d'avalanches de neige par l'entremise d'appareils photographiques automatisés dans la région d'Umiujaq, Nunavik [View project](#)

Snow-avalanche and debris-flow hazards in the fjords of north-western Iceland, mitigation and prevention

Armelle Decaulne

Received: 26 August 2005 / Accepted: 22 May 2006 / Published online: 21 November 2006
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Abstract In the fjords of north-western Iceland, snow-avalanche and debris-flow hazards threaten 65% of the inhabitants. In this area, both historical and geomorphological evidences clearly demonstrate the recurrent danger from the steep slopes. Hazard vulnerability has increased during the last century, in connection with the population development of the Westfjords. Two snow-avalanche disasters during 1995 (in which 34 people were killed in two villages) prompted efforts to both mitigate and prevent future snow-avalanche and debris-flow activity. Research (qualitative and quantitative) on process characteristics describes prone terrain, runout distance, process behaviour along the slope, morphometric properties of the deposits and triggering factors. Acceptable risk, hazard and risk zoning are clearly defined by official regulations. Evacuation plans are determined from statistical characterisation of the risk and dynamic numerical modelling. To enhance the risk reduction, permanent and temporary measures aim to control the processes and to protect the population.

Keywords Avalanche hazard · Debris-flow hazard · Icelandic Westfjords · Prevention · Mitigation · Geomorphological methods · Numerical modelling · Risk acceptance

1 Introduction

Snow avalanches and debris flows represent a threat to settlements and transportation routes in mountainous areas (Hewitt 2004). In Iceland, during the 20th century,

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such slope hazards have cost 193 lives, of which 166 are due to snow avalanches (Saemundsson et al. 2003). During the same period, economic loss were worsening in the island (Johannesson and Arnalds 2001). The north-western part of Iceland, the Westfjords area, is particularly prone to snow-avalanche and debris-flow activity, accounting for c. 90 of given fatalities. This area has a sub-polar oceanic climate, characterised by small annual variations in air temperature, high annual precipitation values and high atmospheric humidity (Decaulne 2001). Here, topographic and climatic prerequisites for snow-avalanche and debris-flow occurrence (Bjornsson 1980; Decaulne 2001) are steep slopes, a mass of loosened snow (Keylock 1997), availability of cohesionless material and excess moisture to saturate and mobilise the debris (Brunsden 1979; Innes 1983).

The purpose of this paper is (1) to present the snow-avalanche and debris-flow hazard situation in the Westfjords, (2) to review the recent research for its mitigation and prevention, including hazard and risk zoning using geomorphological field recognition, analysis of climate conditions and triggering factors, historical knowledge, statistical analysis of topography, risk-based models and multi-risk quantitative analysis and cultural sensitivity.

2 The Westfjords geographical characteristics

A fjord landscape (Fig. 1), carved into Miocene basaltic bedrock during the Pleistocene glaciations, dominates the Westfjords. The lava series, which are almost horizontally bedded, display flat summits from 600 to 900 m a.s.l. (local relief range: 400–700 m). Slope profiles are slightly concave, characterised by steep upper parts (with exposed rockwalls notched by numerous bowls and chutes), moderate to steep mid parts and basal areas covered by low angle talus. The mild and maritime climate, located in the track of North Atlantic Ocean low pressure system, is characterised by a very changeable weather, with sudden changes in temperature and liquid/solid precipitation. Mean annual air temperature is 2.9°C and an average precipitation of

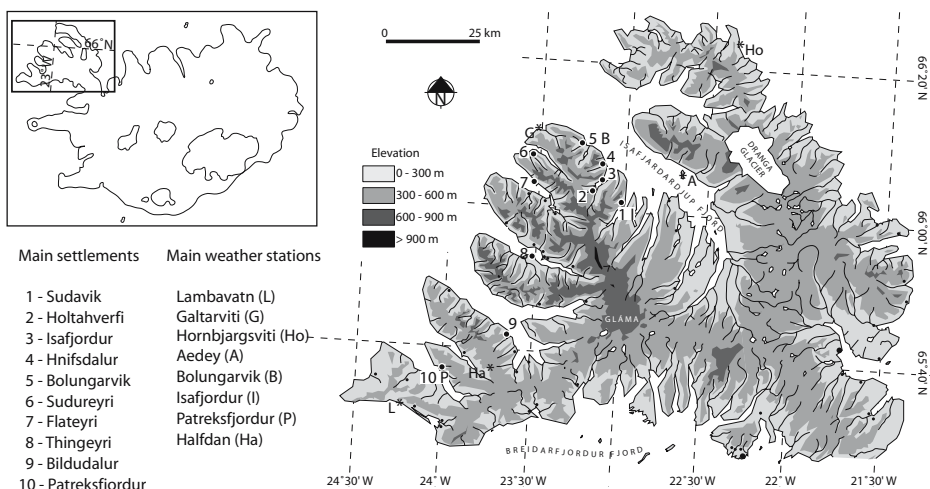


Fig. 1 Location of the study area



Fig. 2 The setting of Isafjördur (a), Holtahverfi (b) and Sudavik (c): top plateau and steep slopes, interrupted or not by an intermediate bench, with rockwall in the upper part. This setting dominates the fjord coast, where communities concentrate from 200 to 2500 inhabitants (photos: A. Decaulne)

969 mm pa at sea level (data compiled from the meteorological stations of Lambavatn, Galtarviti, Hornstrandir and Aedey). Small towns and villages are all located along the seashore, or within short tributary valleys at the foot of steep slopes (Fig. 2).

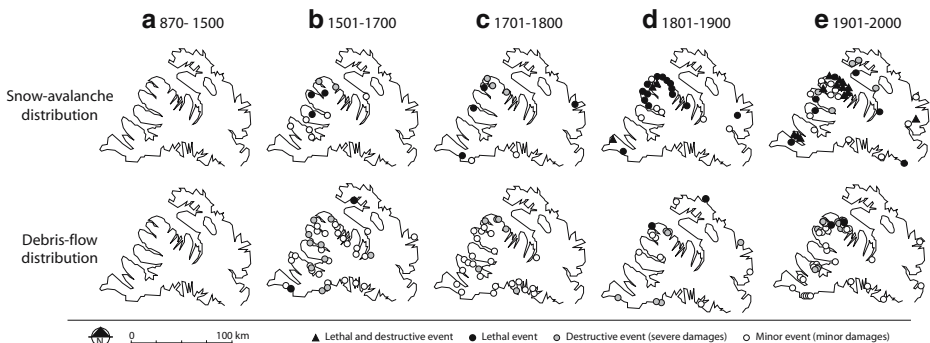
3 Snow-avalanche and debris-flow hazard

On steep terrain, deep snow favours snow-avalanche formation, and large quantities of available debris favour debris-flow formation (cf. 4.2.). In addition, the changeable weather in the area suits these geomorphic processes, with heavy snowfall, rapid snowmelt, long-duration and high-intensity rainfall. The exposure of people and infrastructure at the foot of such slopes compose the hazard situation (McClung and Schaerer 1993; Johnson and Rodine 1984). These conditions are all present in the Westfjords (Johannesson et al. 1996b) that is considered one of five primary locations exposed to snow avalanches and debris flows in Iceland (Gudmundsson 1997). As the affected population does not exceed 5,000 people in the region, the risk level could be regarded as lower than that occurring in European or Canadian mountainous areas. However, this population represents more than 65% of the residents of the Westfjords; consequently, it is an important issue in Iceland.

3.1 Historical records of snow-avalanche and debris-flow activity

Written sources (e.g. local chronicles, notifications by inhabitants and local authorities, newspapers and broadcast information) were gathered together by several Icelandic authors (principally Jonsson, Rist and Petursson (refer to Decaulne 2004)) and by the Icelandic Meteorological Office (IMO) staff. The IMO propose several compilations of snow-avalanche and debris-flow events for several settlements in the Westfjords (refer to IMO website, <http://www.vedur.is/haettumat>).

From the survey of snow-avalanche and debris-flow accidents in the Westfjords since the beginning of the colonisation in the 9th century, distribution maps of known events are produced (Fig. 3). With comparison to settlement location (Fig. 1), it is apparent that both snow avalanches and debris flows threaten most of the communities scattered along the coastline. Nevertheless, the spatio-temporal distribution of natural hazards due to snow avalanche and debris flows is changeable, as are their impacts (Fig. 4). This is especially the case with snow avalanches, where fatalities and property damage are now greater than that occurring historically; as a

A Snow-avalanche distribution from 870 to 2000**B** Debris-flow distribution from 870 to 2000**Fig. 3** Snow-avalanche (**A**) and debris-flow (**B**) distribution from 870 to 2000 in the Westfjord Peninsula (sources: op. cit.)**Fig. 4** Documented snow-avalanche and debris-flow spatial and temporal distribution from 870 to 2000 in the Westfjord Peninsula (sources: op. cit.)

consequence recent snow-avalanche documentation mainly concentrates on areas where higher densities of population or transportation corridors exist.

Written indications of debris flows are numerous, even historically, but lethal debris-flow events were rare and isolated. The more serious impacts involved the destruction of premises for residential use or outbuildings. No significant changes in the spatial distribution of debris-flows through time is observed, but a noticeable spatial concentration of events within the 20th century is reported.

Nevertheless, historical records usually mention only events that caused damages, therefore these data are of limited use when considering locations that are only recently settled. In such cases, geomorphological evidence of processes acting on slopes can provide further understanding.

3.2 Geomorphological evidence

Geomorphic features above settlements in the Westfjords provide evidence of slope instability during the Holocene (Fig. 5), with particular emphasis on snow avalanches and debris flows contributing to talus cone and talus slope development (Blikra and Saemundsson 1998; Decaulne 2001). Apart from these inherited, but still evolving landforms, other present-day evidences of snow-avalanche and debris-flow activity are often observed on slopes and are discussed below.

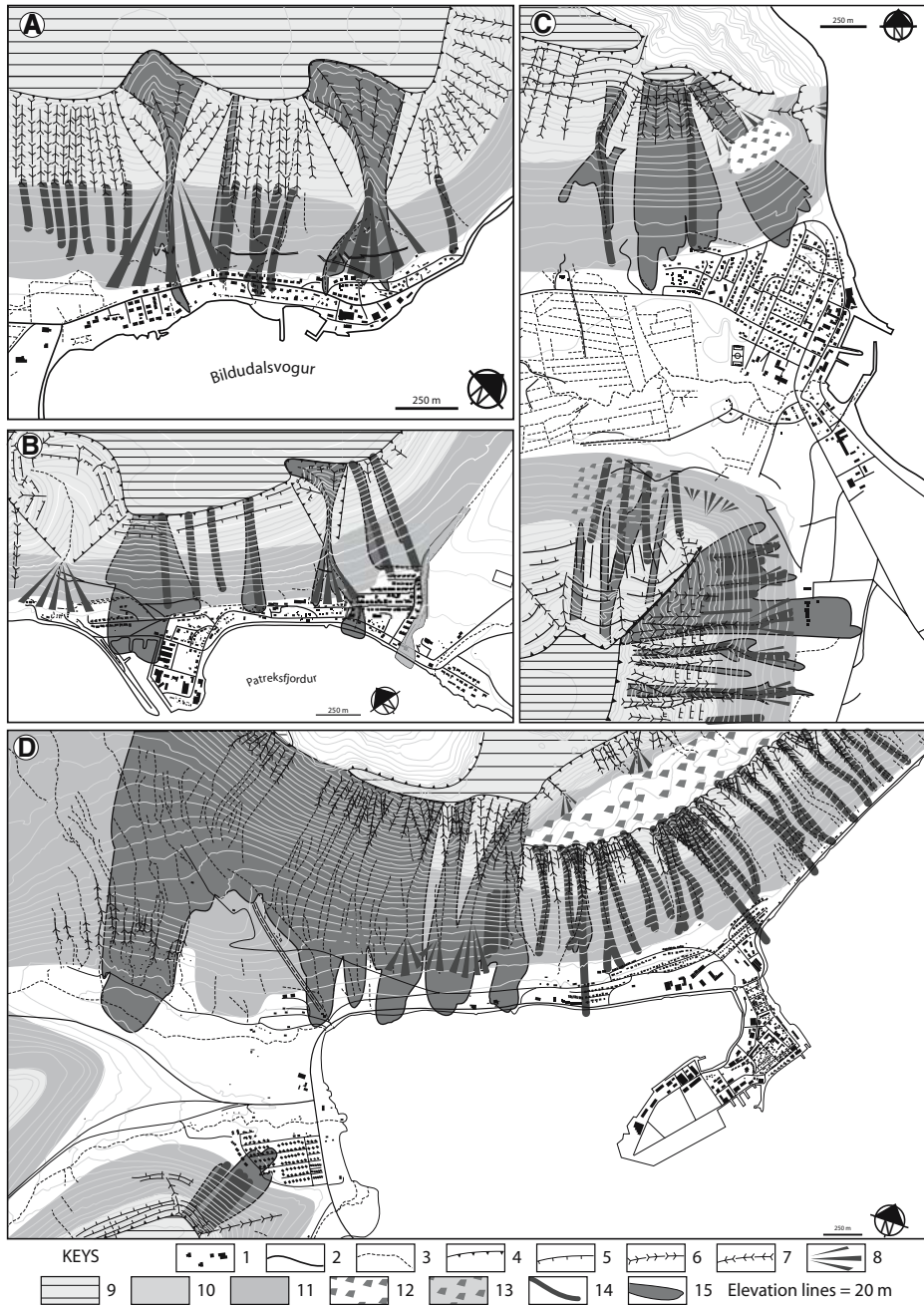


Fig. 5 Simplified geomorphological maps of the study areas of Bildudalur (A), Þatreksfjörður (B), Bolungarvík (C) and Ísafjörður (D) showing the runout distance of documented and recognised in the field snow avalanches and debris flows. 1: buildings; 2: road; 3: brook; 4: cliff edge; 5: secondary cliff (<2 m high); 6: ridge; 7: gully; 8: large multi-process cone; 9: summital plateau; 10: bedrock outcrop; 11: talus; 12: boulder cover; 13: rockslide; 14: debris flow; 15: snow avalanche (including slush flows)

Due to the lack of shrub or tree cover on slopes above the inhabited areas in the Westfjords, recent avalanche paths are not immediately obvious in the landscape. Nevertheless, the avalanche track is recognisable from the start zone to the deposition zone by using terrain analysis. The starting area shows suitable characteristics for snow-avalanche formation, i.e. steep slope gradients (40° – 55°), and a mountain wall carved into numerous shallow gullies where snow can accumulate. Moreover, snowdrift transfer from flat summit areas supplies large amounts of snow to the leeward slopes. Snow-avalanche landforms testify that this process is recurrent and efficient in the study area (Decaulne and Saemundsson 2006b). Commonly, an unsorted accumulation of large boulders (>0.5 m for the a -axis) with a parallel orientation is slightly disconnected from the foot of the talus, and typically deposited by snow avalanches. More indicative, although scattered, are perched boulders and avalanche boulder tongues. Furthermore, slush erosion and/or deposition features are found on talus cones in prone areas (Decaulne and Saemundsson 2006b). This suite of geomorphic evidences enables a more complete appreciation of avalanche paths, greater than that offered by historical data alone, even if not compiled in an avalanche Atlas.

With the typical channel bordered by lateral levees and the levee inverse vertical sedimentary architecture, debris flows produce landforms that are easily identified in the landscape, even if some of these landforms are covered with vegetation. Above settlements, only remnants of historical depositional lobes are visible, as material is frequently cleared after a debris-flow event to expose buried parts of inhabited areas. Fresh landforms are more visible (Decaulne and Saemundsson 2003; Decaulne et al. 2005), and can be seen at all slopes, adjacent to older ones. Debris flows mobilise large volumes of material that are stored on benches and in the upper part of the slopes. Recently, Glade (2005) using geomorphological analysis considers the debris-flow potential in Bildudalur, highlighting the role of sediment availability, reproduction and removal, in an empirical modelling of debris-flow hazard assessment.

Above settlement areas snow avalanches and debris flows do not occur systematically at the same site. For example, in the case of Isafjordur, the areas located above the main residential zone are clearly dominated by debris-flow activity, but at some sites both snow-avalanche and debris-flow activity are recognised. Such dual-process sites are found in Patreksfjordur, Bildudalur, Bolungarvik (Decaulne 2004) and in Sudavik. In the latter scenario, the role of avalanches in supplying sediment to debris-flow channels has not been measured, but is presumably limited as snow avalanches occurring under present environmental conditions are unable to carry out strong geomorphic work within their track (Decaulne and Saemundsson 2006a).

The spatial distribution of snow-avalanche and debris-flow geomorphological evidences underlines a noticeable difference in their progression downslope. Whilst snow avalanches move straight downslope, following the same path in successive events, debris-flow tracks move laterally, migrating in mid and lower parts of the slope, leaving the source-area as the only fixed element within the path.

3.3 Increasing threat due to snow-avalanche and debris-flow activity

Historical sources and geomorphological investigations clearly show that both snow avalanches and debris flows occur recurrently at the present time in the fjord areas of north-western Iceland. More precisely, the most serious threat increased during the

20th Century, owing to economic and social changes of the area, i.e. migration of the rural population towards coastal communities, in connection with the growth of the fishing industry (Johannesson 2000; Skaptadottir 2000). Increasing avalanche accidents are not significantly related to winter recreation but to poorly located new buildings. New areas were colonised, with no or scant knowledge of avalanches and debris flows acting in these areas, and inhabitants encountered more dangerous situations with time (Decaulne 2004). The period from 1940 to 1980 corresponds to the most favourable climatic conditions of the 20th Century (highest air pressures and temperatures, lowest precipitation) and concentrates the larger part of population growth and building construction (Decaulne 2005). Since the 1990s, whilst the population has decreased by 10–20% within the Westfjord Peninsula (Willhardt 2004), the number and location of buildings is still the same.

4 Mitigation and prevention of snow avalanches and debris flows

The mitigation and prevention of snow-avalanche and debris-flow hazards requires societal awareness and action. This comprises several stages. First, there is a need for realisation that a population is at risk. Then, a reliable survey of snow-avalanche and debris-flow terrains is required, to assess topographic (starting zones, tracks and paths) as well as triggering factors. Subsequently, hazard planning, including hazard and risk zoning, comparison with acceptable risk levels and, finally, the implementation of countermeasures has to be carried out.

4.1 The turning year 1995

Before 1995, only occasional studies pointed out the hazard related to snow avalanches, and sometimes to debris flows in the Westfjords. Reports following damaging events often associated documented avalanche occurrence and technical aspects of avalanche impact on settlements (e.g. in Patreksfjordur, Bildudalur, Isafjordur and Sudavik). These reports indicate that the official authorities are willing to reduce the threat, specifically after the slush avalanches in Patreksfjordur in January 1983, in which 4 people lost their lives. Indeed, regulations were established by the Icelandic Civil Defence according to the findings of these different studies (regulation #247/1988), to create hazard and risk zoning guidelines and to propose appropriate defence structures.

Nevertheless, the question of risk acceptance by individuals and society (e.g. Fischhoff et al. 1981; Rohrmann 1998) was not the main issue at that time. As damages were local, mainly material and historical lethal accidents were rare in the area. This indicates the gap between the analysis of physical aspects of the threat, perceived as necessary by governmental institutions; and the perception of the threatened populations who lack a complete understanding of the destructive potential of the slope processes.

The catastrophic year 1995 highlighted the low avalanche prevention, poor avalanche preparedness and inadequate planning in Iceland (Colombo 2000; Bernhardsdóttir 2001). Two destructive avalanches occurred within a 15 km radius, inflicting a very severe toll (34 deaths, 50 residences destroyed or damaged). These followed the huge avalanche of Seljalandsdalur in Isafjordur in 1994 (one death and 40 summer houses destroyed). These occurrences suddenly raised the awareness of

snow-avalanche hazard. The Icelandic Government responded promptly to this situation, in order to reduce such further disasters (Magnusson 1996). New legislation appointed the Ministry of the Environment as the institution responsible for avalanche matters. Furthermore, the IMO was put in charge of snow avalanche research and other processes acting on slopes (Magnusson 1996). An outcome of research findings was the evolution of legislation and re-evaluation of regulations. In particular, the implementation of new hazard zoning and planning (regulation #49/1997 that has been changed into #505/2000).

Another aspect is that these successive disasters enhanced societal awareness of hazards (Magnusson 1996; Haraldsdóttir 1998a, b). First, the potentially destructive effects of snow avalanches were more clearly perceived; second, several events unknown to the authorities were reported by the local population. This information strengthened knowledge about long avalanche runout distances, as most of these previously unreported avalanches reached the bottom of slopes in areas where residences have been recently constructed.

4.2 Knowledge of snow-avalanche and debris-flow characteristics

Spatio-temporal occurrence of snow avalanches and debris flows is of major importance. Historical data are therefore very useful, and mostly rely on reports from local communities that directly witnessed the events or noticed their deposits (e.g. road dissection, broken fences ...). As stated previously, most of the extreme events that have occurred since the foundation of permanent settlements in the Westfjords are documented. Information have been supplied by the local population empowered by the 1995 disasters. In addition, a survey of older extreme events was performed on the lower slopes, within the inhabited area, by means of vertical stratigraphy, highlighting the long runout distances of snow avalanches and debris flows (Saemundsson 2002).

Moreover, knowledge of potential snow-avalanche and debris-flow terrain is essential. Therefore, analyses of avalanche and debris-flow behaviour along the slope, as well as runout-distances, were carried out to predict the area that might be affected by each of the processes. Geomorphological assessment of the landforms on talus were performed by Decaulne (2001), analysing the morphometric properties of the snow-avalanches and debris-flow deposits.

Furthermore, the IMO quantified snow-avalanche runout distances using modelling. As data on long runout distance avalanches in a given path are usually too limited to base the risk estimation on, transferring data from other paths was proven to be more significant with the help of numerical models that simulate runout (Sigurdsson et al. 1998b). In particular, the runout-ratio method, developed by McClung et al. (1989), was applied on Icelandic slopes by Keylock (1996) and Keylock et al. (1999). The Norwegian α/β model, developed by Bakkehoi et al. (1983), was applied in Iceland by Johannesson et al. (1996a) and Johannesson (1998). In addition, a dynamic model such as the PCM model (Perla et al. 1980), calculated snow avalanche runout distances, flow velocities and impact pressures along the avalanche path. Hence, the return periods of given runout length snow avalanches were calculated according to the Icelandic data set. This was at varying lengths within the path that correspond to a defined runout index (Jonasson et al. 1999), in order to delineate the hazard zoning. For a similar purpose the 2D avalanche model SAMOS, developed in Austria, has been run for starting zones above

several town and villages of the Westfjords (Johannesson et al. 2001, 2002a; Tracy and Johannesson 2003; Sigurdsson 2004). This highlights a number of characteristics including the effects of lateral spreading on the shortening of runout, differences in runout according to starting zone size and different degrees of lateral spreading, direction and shape of the main avalanche tongues.

Knowledge of weather conditions prior to the event release, and triggering factors, are important too (e.g. Johannesson and Jonsson 1996c; Bjornsson 2002; Saemundsson et al. 2003). Avalanche hazard is greater during the passage of low-pressure systems, that can bring strong north-westerly to north-easterly winds. These periods are commonly accompanied by heavy precipitation, hence can provide important snow accumulation over the summit plateaux and in the starting areas of the leeward slopes. Wind, and consequently snowdrift are of primary importance in snow avalanche release (Haraldsdóttir 2004; Haraldsdóttir et al. 2004). Rapid snowmelt due to rising temperature and/or rainfall is favourable for slush-flow release in suitable areas (Decaulne and Saemundsson 2006a; Saemundsson 1997; Saemundsson and Kiernan 1998). Study of debris-flow triggering factors (Decaulne 2001; Decaulne and Saemundsson 2003; Saemundsson et al. 2003; Decaulne et al. 2005) strongly underlines the role of rapid snowmelt and long-duration rainfall as prerequisites for debris-flow release in this part of Iceland.

4.3 Estimation of acceptable risk, hazard and risk zoning

4.3.1 Acceptable risk

Definition of acceptable risk is a major issue when dealing with natural hazards in inhabited areas. In Iceland, definition and implementation of acceptable risk levels for processes acting on slopes were enacted by the Ministry of the Environment (2000) in a national regulation, following detailed guidelines to carry out risk analyses (Jonasson et al. 1999). Icelandic authorities have adopted the value $<0.3 \times 10^{-4} \text{ a}^{-1}$ (The Ministry of the Environment 1997, 2000) as an acceptable risk of death for individuals due to avalanche activity.

Bell et al. (2005) also recommend that acceptable risk analysis considers ‘object risk to life’ (in which all persons present in a house are considered) instead of just focusing on individual, i.e. working at high data resolution. Moreover, these authors strongly recommend a dynamic approach to risk analysis and risk acceptance, instead of a static one, as both risk and risk acceptance are evolving spatially and temporally.

4.3.2 Hazard and risk zoning

Both qualitative and quantitative approaches for the estimation of hazard and risk zones were used in the Icelandic Westfjords:

- Following the Icelandic risk acceptance setting and modelled estimates, risk zones are officially defined using risk lines. Individual risk is the base of official risk zoning in Iceland (Arnalds et al. 2004). It is defined as the yearly probability for a person present at a given location to be killed by an avalanche. Then, the definition of risk zones is based on the local risk, which is the annual probability of being killed, given that the person is present all the time in a building. Three

- zones are therefore defined, according to the risk calculation, from the most dangerous one where new constructions is prohibited, to the less exposed one where gathered buildings have to be reinforced (Jonasson et al. 1999).
- A raster-based approach is used by Bell and Glade (2004a, b) to make a multi-hazard analysis, in which the risk posed by each process acting on slopes is calculated as a function of the input parameters (hazard, damage potential, occurrence probability, vulnerability, probability of the temporal impact, probability of the spatial impact, probability of the seasonal occurrence). Results for each process are presented as individual risk to life (which considered the risk for a single person present in a respective building) and object risk to life (in which one person out of the total number of people staying in a building may die), and as economic risk. Depending on the number of people present in a house “object at risk to life” might be significantly higher than individual risk to life (personal communication Bell, June 2005). Single process risk maps are then combined into multi-hazard risk maps. Final risk maps do not refer to lines separating specific risk zones, but to a 20 m × 20 m resolution grid in which two adjacent buildings may not reach the same risk level according to the number of people present, the cost of the building, etc. A multi-risk concept (MultiRISK) is therefore developed (Glade and Elverfeldt 2005). This method is more accurate, highlighting risk discrepancies between contiguous buildings, and suppressing the risk zone delineation.
 - A combination of geomorphological, historical and lichenometrical approaches provide heterogeneous data about the longest documented runout distances of snow avalanches and debris flows. On the basis of all documented avalanche and debris-flow runout distances, the late 20th Century risk situation was highlighted, showing that most of the upper houses are located on the trajectory of avalanches and debris flows (Decaulne 2001); then another approach integrated combined spatial-temporal expansion of (1) built areas and (2) known avalanches and debris flows to finally underline that the 1990s risk situation was progressively built up, without risk consciousness through the 20th century (Decaulne 2004, 2005). Hazard was also studied using magnitude and frequency relationships (Decaulne and Saemundsson 2003). More recently, data obtained above settlements were combined to geomorphological evidences obtained in remote areas, as most of the runout evidences are no longer visible within the communities; the runout distances “off-zone” were then transferred “on-zone”, i.e. in Patreksfjörður and Bolungarvík, using a topographic model (α/β model); it underlines that the furthest reach of snow avalanche transported boulders is longer than the longest avalanche runout distances recognised within inhabited areas on the basis of historical data (Decaulne and Saemundsson 2006c).

5 Hazard and risk reduction

5.1 Warning system

5.1.1 Hazard forecasting

In Iceland, the hazard forecast procedure is designed for snow avalanches rather than for debris flows (Magnusson 2003). To predict potential avalanche formation, the snowpack is surveyed during winter months. Snowpits are regularly dug to

enable the testing of snowpack stability, especially after each snowfall (McClung and Schaerer 1993). Moreover, a network of snow stakes and automatic weather stations have recently been installed within the starting zones, to monitor the depth of snow accumulation and meteorological conditions (precipitation and temperature), respectively. Accordingly, daily snowpack conditions are transmitted to the Avalanche Forecaster at the IMO (Magnusson 2003) where data are compared with weather forecasts.

Debris flows are not subject to any kind of forecasting survey. Whilst the starting zones are known and mapped, it is frequently several hours after the initiation of a debris flow that alert procedures begin. Recent studies considering the triggering of debris flows, especially major events (Petursson and Saemundsson 1999; Saemundsson et al. 2003), highlight conditions such as increasing creek water turbidity and frequent rolling stones released from the debris-flow source-areas (Decaulne et al. 2005). Such indicators prior to the first debris-flow pulse could speed up the evacuation process at specific locations, mobilise the excavation machines that will remove the material, and minimise the potential damages in inhabited areas. Thus, these studies might be of use in predicting major events in the future.

5.1.2 Alert procedure

The avalanche alert procedure specifies the actions and measures that have to be undertaken during the alert period (Fig. 6). It contains three levels of alert under the authority of the IMO (Magnusson 1996), in which the avalanche forecaster on duty at the IMO is in permanent contact with weather forecasters and local snow observers. Local and National Civil Defence Committees and local authorities (Chief of the Police) are contacted when the alert stage is declared, according to available information on weather conditions and snowpack stability. Successive evaluations and re-evaluations are passed by filling a specific form, from code grey to code yellow, upgrading or downgrading the alert status according to new information.

Evacuation procedure is ordered by the IMO and initiated by the local Chief of the Police (Fig. 6). The area at risk is divided into several areas of evacuation depending upon the magnitude of the predicted event (Magnusson 2003). Each evacuation zone is separated from the adjacent one by a dividing line that delimits the lateral spreading of the avalanche path; moreover, the evacuation zone is subdivided into three levels that reflects the possible runout of the avalanche. Each runout sub-zone is identified with a letter that identifies a given number of buildings, which facilitates the evacuation order transmission by the local avalanche committee.

5.2 Control of snow-avalanche and debris-flow impact within the settlement

5.2.1 Snow avalanches

In north-western Iceland, avalanche control includes flow deflection and deceleration methods and regulation of the presence of people (Johannesson et al. 1996b). The application of these controlling strategies depends upon local topography and size of exposed populations. Following the international avalanche protection classification (McClung and Schaerer 1993), protective measures are divided into temporary (active measures) and permanent (passive measures) types. Temporary

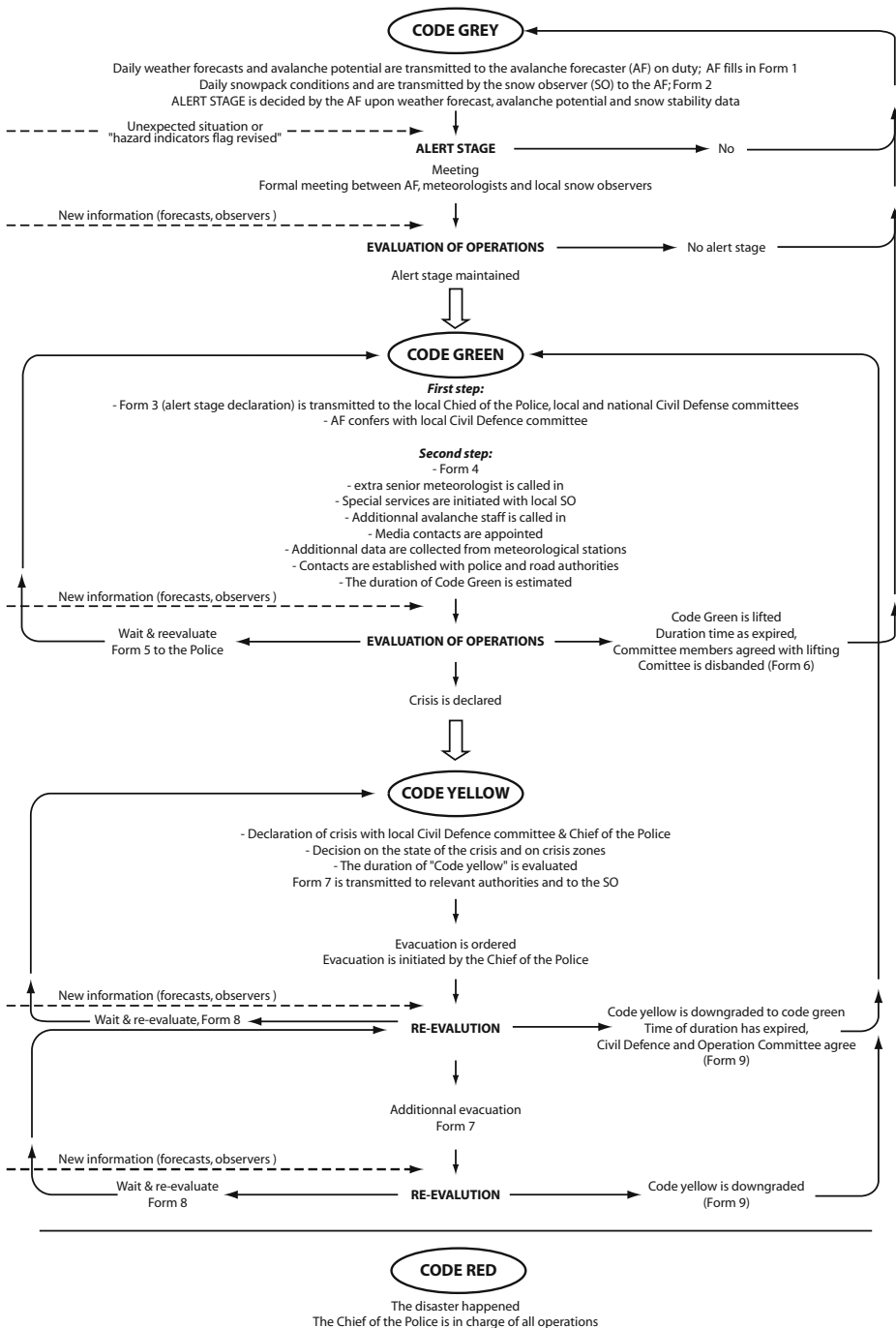


Fig. 6 The Icelandic alert procedure (modified from Magnusson 1996)

measures are primarily applied for short-time periods, in areas where great damages and loss of life are not expected. In the most exposed areas, permanently engineered structures are preferred, despite their expense. These are combined with daily hazard evaluations to assess whether a snow avalanche will exceed the design limit of the structures, which if unchecked could otherwise cause fatalities.

Artificial release of snow avalanches, as a protective measure, is not used in the study area, mostly because of the high probability of impacting settlements located in the runout zone. Hence, avalanche protective methods are limited to engineering works and land-use restrictions.

Temporary or permanent land-use restrictions include closure of roads or recreation areas, evacuation of buildings (residential, industrial and administrative buildings). Government compulsory purchase schemes for houses and removal of residential areas. Road closures and evacuations (from 5 to 56 buildings at once) have been implemented several times during avalanche alerts, and were almost the only protective measures used prior to 1998.

Engineering works consist of permanent structures that operate at the bottom of the track in the uppermost part of the runout zone. An earthfill deflector (Fig. 7a), built above the village of Flateyri (Sigurdsson et al. 1998a; Johannesson 2001), re-directs avalanches from the two main tracks that threaten the village. A smaller deflector (Fig. 7b) has been built above the waste burning plant of Isafjordur, which was damaged in 1995 by an avalanche. These deflectors are very efficient, as observed during the winters that followed their completion. Similarly, a large deflector with retarders was built above the Seljalandshlid area in Isafjordur, to protect residential buildings from potentially destructive snow avalanches (Fig. 7c).

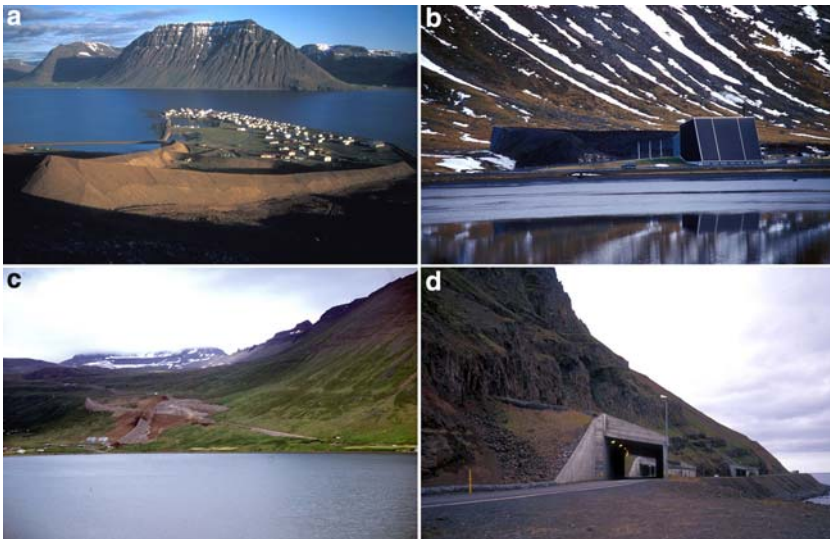


Fig. 7 Engineering works that mitigate the avalanche effects for local population. (a) the Flateyri deflector; the left part of the village was destroyed by the 1995 avalanche. (b) The Funi deflector that protects the garbage burning plant of Isafjordur. (c) The Seljalandshlid deflector that protects a part of the residential areas in Isafjordur and (d) snow sheds on the Oshlid road that protect traffic from frequent snow avalanches (photos: A. Decaulne)

A construction project for another protective deflecting dam is underway in the Holtahverfi area (Isafjordur zone), given that this locality has been hit by three events during the last five decades. Also, small earth dams were constructed on debris cones above the settlements of Bildudalur and Patreksfjordur. Retarders are earth mounds used as obstacles to dissipate the kinetic energy of avalanches and reduce their runout distance above roads or villages. They are not widespread, as burial by snowfall and repetitive snow avalanches limit their intervention efficiency. Due to this characteristic, a deflector replaced retarders that were located above the village of Flateyri. Nevertheless, when correctly designed, their efficiency can be equal to deflectors one (Hakonardottir et al. 2003a b). Timber splitters can be placed in front of power line pylons, to re-direct avalanche flows around these vulnerable structures. However, this is rarely undertaken in north-western Iceland. On the exposed Oshlid road, between Bolungarvik and Hnifsdalur, where up to 255 snow avalanches occurred during the winter of 1982–1983 (personal communication from Jonsson, 1999), 23 avalanche paths exist. Given the high usage of this route, dangers to traffic have been reduced with the construction of four concrete snow sheds (Fig. 7d). These cover the width of selected avalanche paths, allowing snow and debris to overpass the road. Nevertheless, the galleries do not cover the whole length of the road, therefore it remains closed (locked gates) for a period of time every winter. An ongoing project in the vicinity of the road is the use of technology to detect avalanche-induced ground vibrations (Bessasson et al. 2003). Supporting structures, such as snow nets and snow bridges, are now being considered for the starting area of snow avalanches in Hnifsdalur and Holtahverfi. This follows the application of such techniques in snow avalanche threatened localities in the eastern part of Iceland.

5.2.2 Debris flows

Debris-flow prevention and mitigation measures are concentrated in the area of Isafjordur and encompassing roads. Furthermore, dams/small stonewalls have also been built in Sudureyri, Bildudalur and Patreksfjordur, where effects are less severe. Temporary control of people presence includes road closures, which between Hnifsdalur and Isafjordur are frequent. Here debris-flow deposits have covered the road on at least twenty occasions between 1900 and 1999 (Petursson and Saemundsson 1999). On the road between Bolungarvik and Hnifsdalur, steel nets supported by steel pillars (Fig. 8a) contain the deposits, and limit overflowing onto the road. In Isafjordur, a ditch was dug above a part of the settlement to drain the water runoff from the hillside. It appeared that this ditch could contain the first pulses of a debris-flow event, but the following pulses quickly filled the ditch with material. Elevated pressures exerted on the downhill side of the ditch increased the probability of ditch failure (Decaulne and Saemundsson 2003); therefore, posing a significant danger to the inhabitants who live in the path of these debris flows. After the 1999 event, which led to the evacuation of almost 50 houses (c. 120 inhabitants), a protective structure was erected along a section of the slope. In addition, the ditch was widened and deepened (Fig. 8b) and a dam (built with local sand, gravel and stones) reinforced the downhill wall of the ditch. Two drainage holes were installed at different levels to reduce the risk of flooding to the downhill residences.

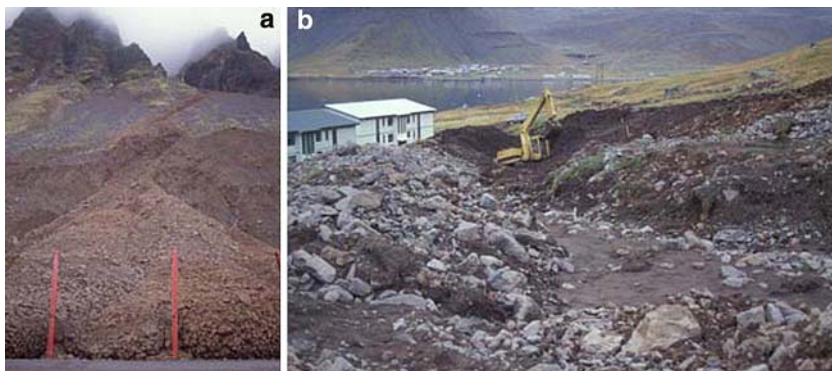


Fig. 8 Mitigation of the debris-flow hazard by 3 m high steel nets (**a**) that guarantee a better security for traffic, and combination of ditch and dam protective structure (**b**) (Photos: A. Decaulne)

6 Conclusion

Hazards due to snow avalanches and debris flows are an increasing factor for land use planning and recreational activities in Iceland, impacting residential areas, outside activities, energy and transmission infrastructures, and transportation corridors. The 1995 avalanche disasters raised Icelandic public awareness of the risk and precipitated a desire to improve knowledge to reduce hazard impacts. This is particularly true for snow avalanches in Iceland.

The knowledge required to deliver prevention and mitigation of snow-avalanche and debris-flow hazard in the Westfjords has significantly improved during the last 10 years, owing to analyses that combine the geomorphological approach, historical sources and hazard modelling (Glade 2005). Further and closer collaborations between experts from various fields (e.g. geologists, geomorphologists and geographers, meteorologists and climatologists, engineers, historians, sociologists, philosophers, and politicians...) will enable a multi-disciplinary approach to the risk issue in Iceland. These exchanges need to keep in mind the key issues, namely (1) risk and risk acceptance, (2) hazard and risk zoning subjected to spatio-temporal changes, and (3) to enhance knowledge of potentially destructive event occurrence.

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Alternative Observations for Cornwall/Whitaker Avalanche overlay adjustment request.

1. What is the significance of the wet avalanche that moved the 2 houses? What is the physical evidence that wet slides occur in this track?
2. What are the inconsistencies between the 1974 INSTAAR map and the adopted 1994 Town of Ophir avalanche Hazard map.

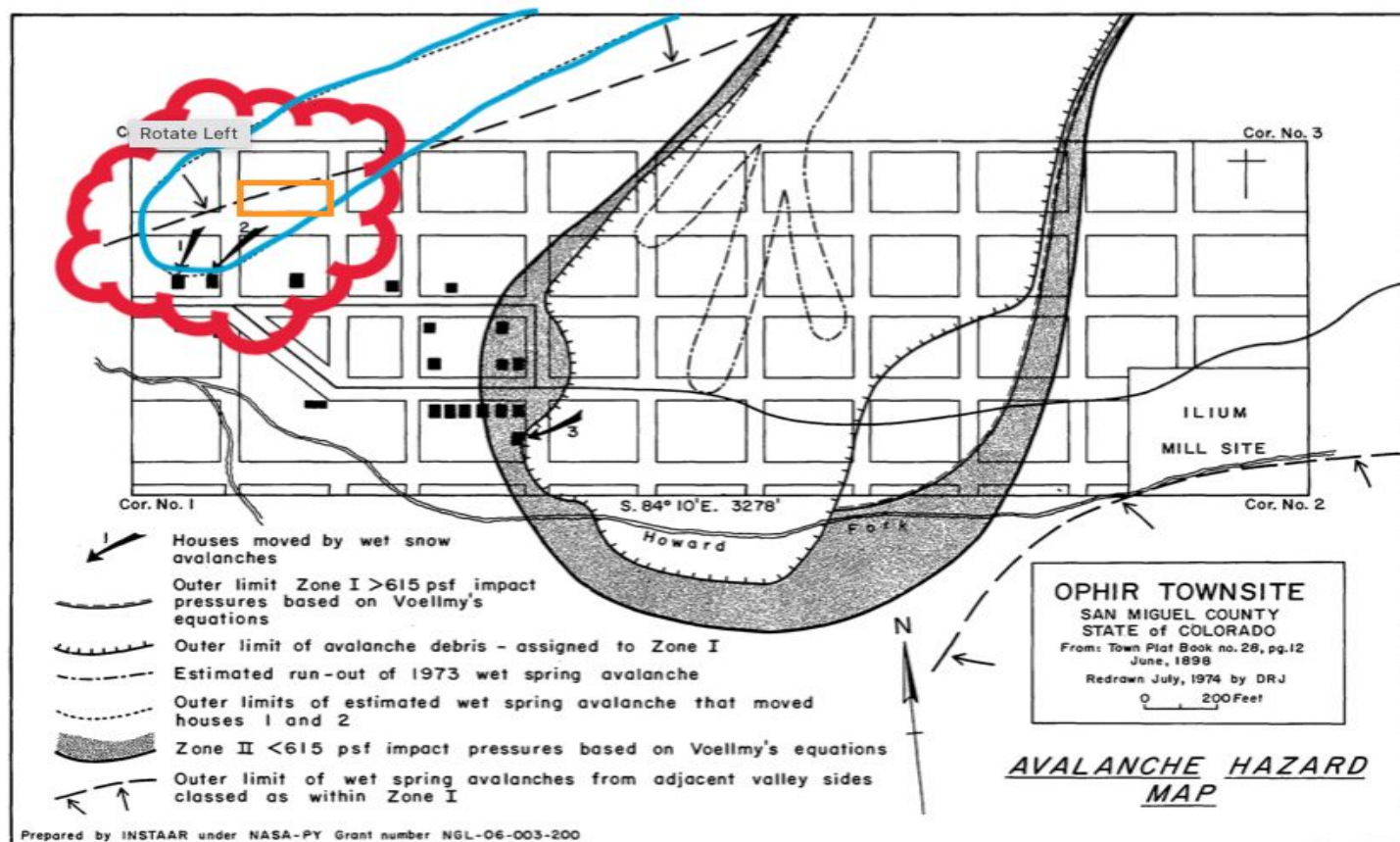


FIG. 10. Detailed avalanche hazard map, Ophir.

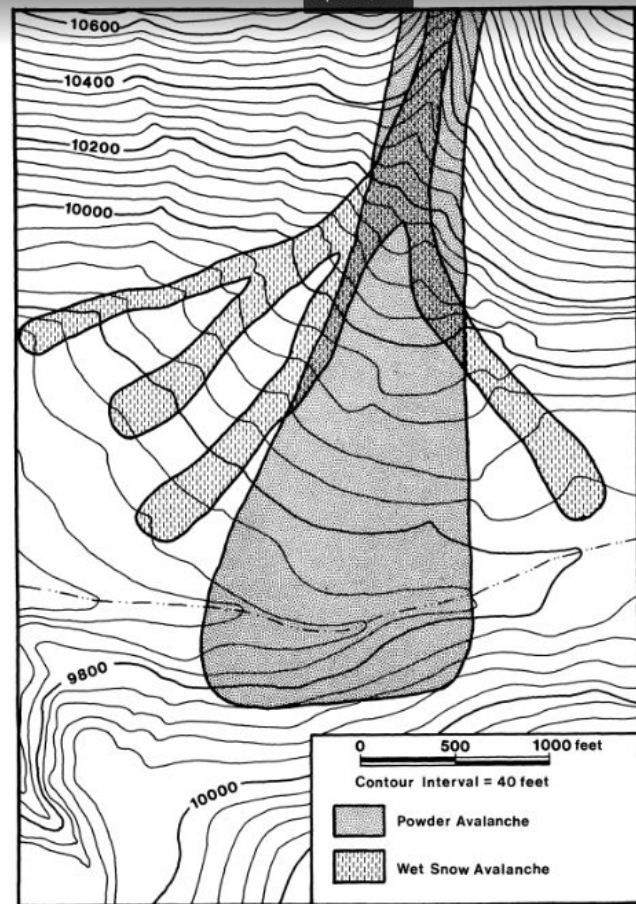
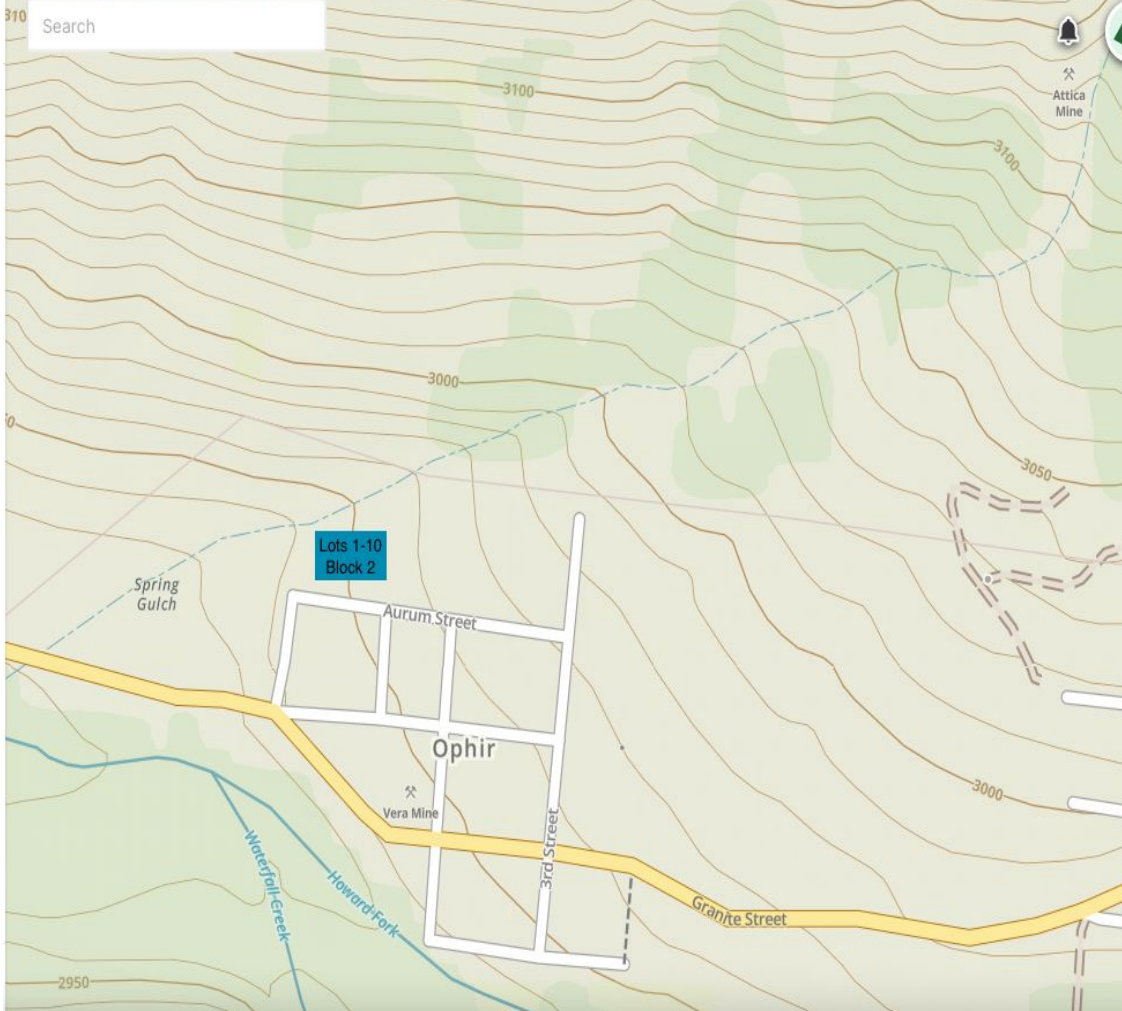
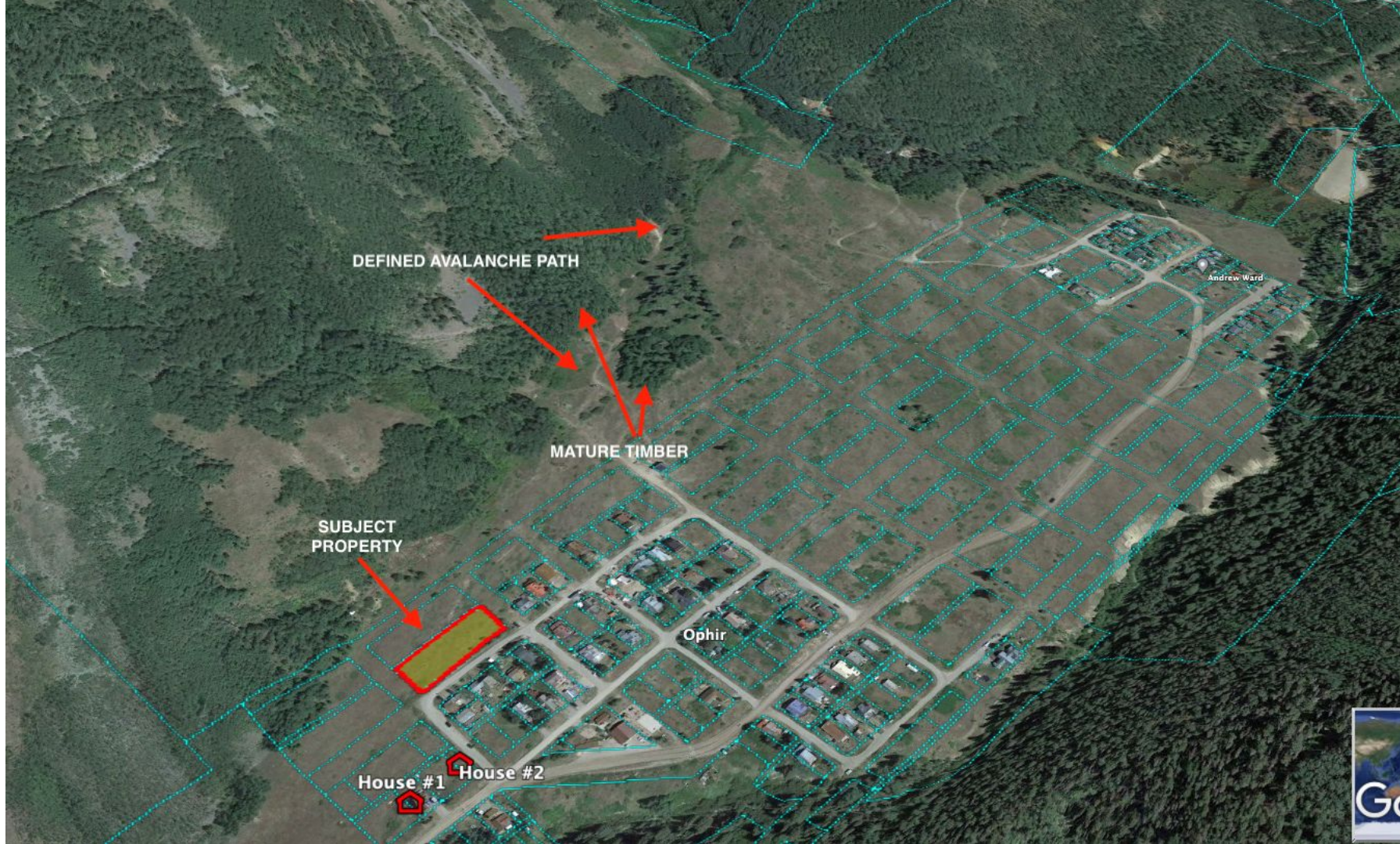


Figure 5. Different types of avalanches can affect different parts of the runout zone in this debris fan. Slow moving wet snow avalanches follow gullies and are deflected by small ridges. Powder avalanches advance across the fan in the direction attained in the channeled track. (Mears, 1976a).



DEFINED AVALANCHE PATH

MATURE TIMBER

SUBJECT
PROPERTY

Ophir

House #1

House #2

Andrew Ward





tematically, since their distribution provides good evidence for the minimum extent of avalanche activity. Such debris, however, is probably the result of multiple events: debris may not necessarily be carried all the way to the extreme end of the run-out; and tree debris may be absent from some areas because of disturbance by man. Nevertheless, useful supple-







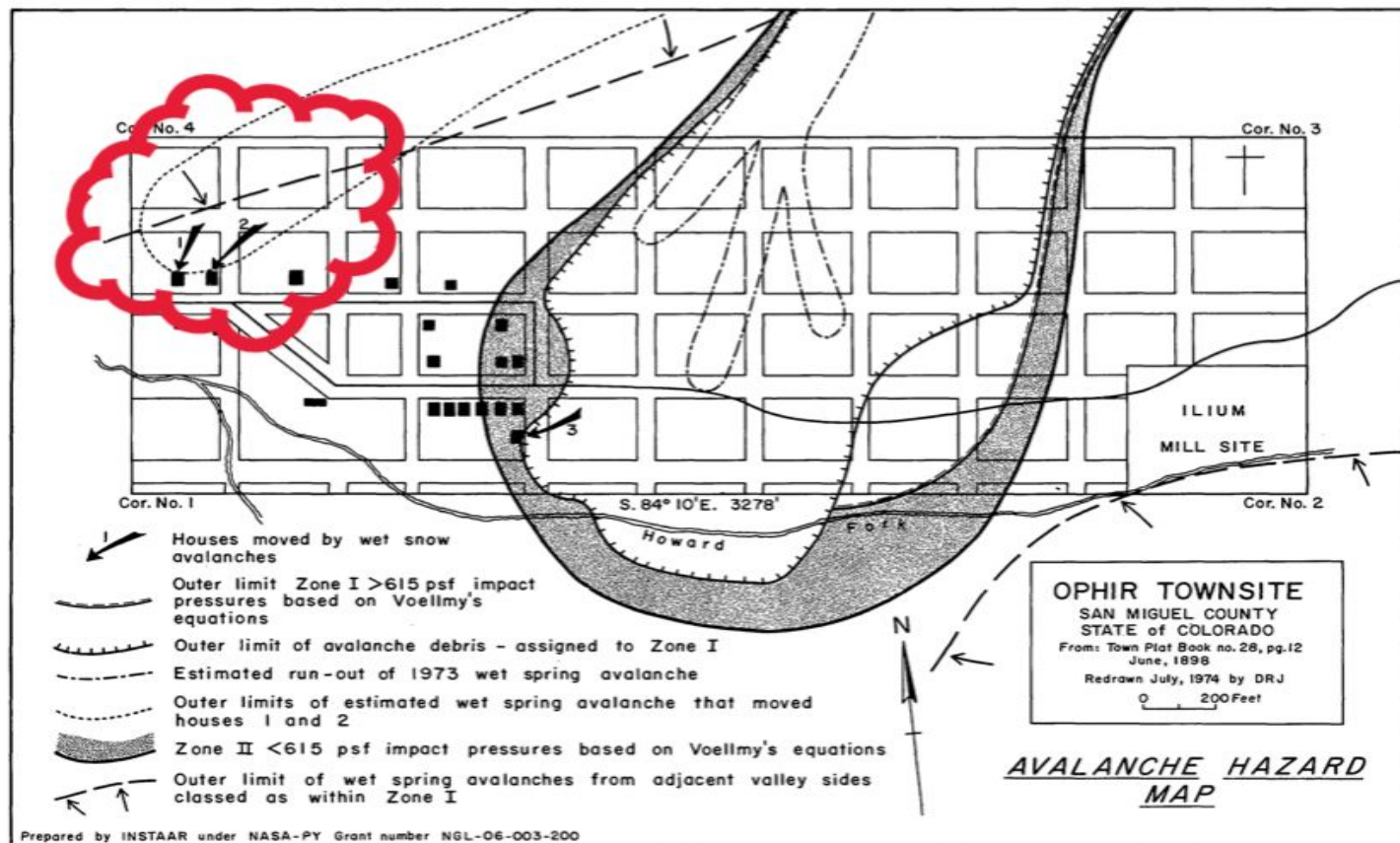


FIG. 10. Detailed avalanche hazard map, Ophir.

1952 Plat showing houses 1 and 2



NEW S.H. 145
ALIGNMENT
10153(10)

TOWNSITE OF OPHIR



OPHIR CORPORATION
OPHIR, COLORADO
PLAT OF
OPHIR LOOP & OPHIR

SCALE 1" = 100' 8 OCTOBER, 1952

CG4314 .066 1952 .06

Site Specific Analyses

Table 1 presents the results of our analyses for the design magnitude avalanche. The ranges reflect variations that depend on location. The degree of hazard comes from three potential avalanche paths and varies with location. In general a greater hazard exists from the Spring Gulch and Staatsburg paths towards the east-northeast (up-gradient). The Group 3 path presents a greater hazard towards the northwest. The return period estimates reflect both location and an uncertainty of about one-half order of magnitude.

Table 1 – Design Magnitude Avalanche Parameters

Path Name	Reference pressure (kPa)	Estimated Return Period (yrs)	Avalanche Type
Spring Gulch	15-20	30-100	Wet
Staatsburg	10-15	30-100	Wet
Group 3	1-16	30-300	Wet

kilopascals

20

<=>

pounds per square foot(psf)

417.709

precision: auto

20 kilopascals = 417.709 psf

For reference: Roofs in Ophir are engineered for about 120# PSF, live snow load (this equals about 7-8' of snow). Walls are designed to withstand winds up to about 135 mph and are engineered to about 50# PSF.

Did the Avalanche that moved houses 1&2 occur? Is it possible that it can occur again?

1. The topography is adequate to channel wet snow avalanches towards NW corner of the Town of Ophir, including lots 1-10 of block 2. These wet snow avalanches can originate from Spring Gulch, Staatsburg paths and Group B paths.
2. Vegetation damage and tree debris in the avalanche track and runout are evidence that avalanches have occurred in the path/track repeatedly.
3. There is historical information that an avalanche occurred, travelled this track and moved house 1&2 within the recent past.
4. Wilbur report concludes that the property is exposed to avalanche hazard and that significant impact pressures should be anticipated.

A look at the inconsistencies between the 1974 INSTAAR map and the 1994 adopted Town of Ophir Avalanche Hazard map.



NOTE

THE INFORMATION CONTAINED IN THIS MAP HAS BEEN OBTAINED FROM THE AVALANCHE HAZARD MAP DATED JULY 1974 PREPARED BY INSTAAR UNDER NASA/PT GRANT NO. NSG-06-003-200 AND FROM THE TOWN OF OPHIR

Conclusions

Official Hazard Map

The Official Hazard Zoning Map of the Town of Ophir is based on the 1976 INSTAAR study (Ref. 1). That study used reference impact pressures of 615 lb./ft² (30 kPa) to define "Zone I" which corresponds to High Avalanche Hazard where no development is recommended. We have identified two inconsistencies between the official map and the INSTAAR Study. The subject property is located in an area affected by these inconsistencies.

1. The adopted map applies the "High Hazard" designation to the limits of a wet snow avalanche originating in Spring Gulch that moved two houses, but lies outside of the INSTAAR "Zone I."
2. The official map does not properly designate as "High Hazard" the "Zone I" area at the northwest corner of the platted town that is affected by wet snow avalanches originating on the steep slopes north of the subject property. This particular hazard corresponds to one of the Group 3 avalanches in Figure 2.

GENERALIZED AVALANCHE HAZARD MAP

- Major avalanche paths
- Small avalanche paths
- Major alluvial fans
- Spring gulch run-out symbols same as in Figure 12

- Houses in Ophir
- County road
- Jeep trail
- Highway

N

Page 46 of 78

NATURAL HAZARDS IN COLORADO

141

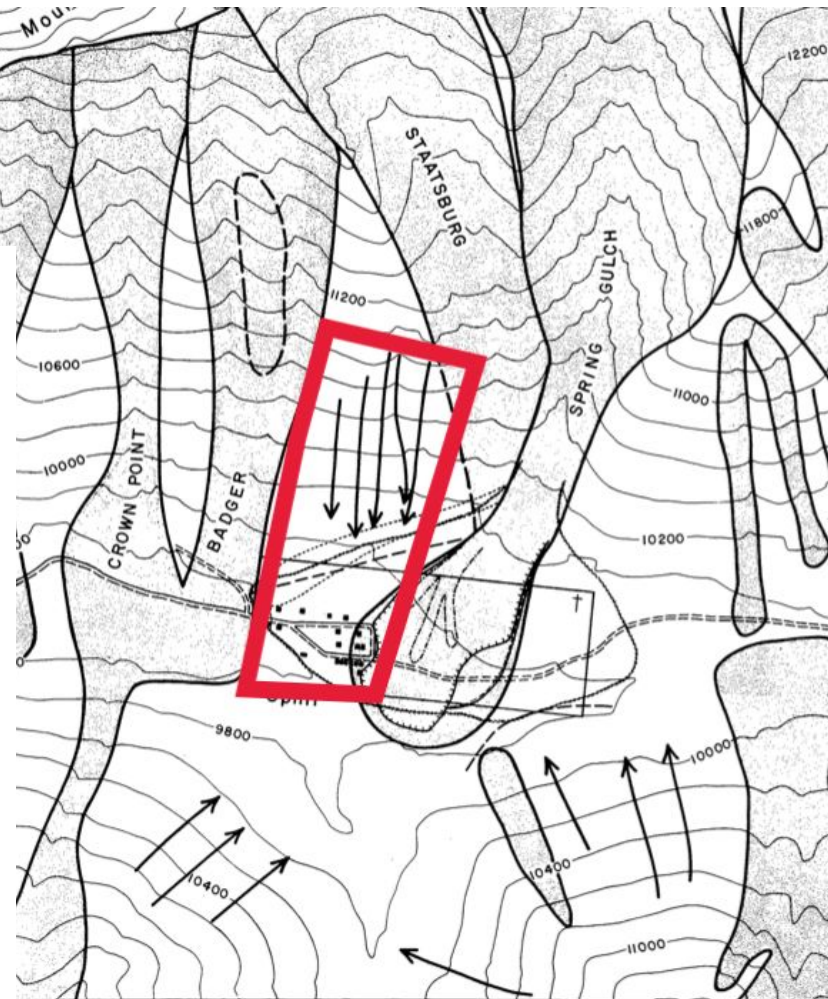
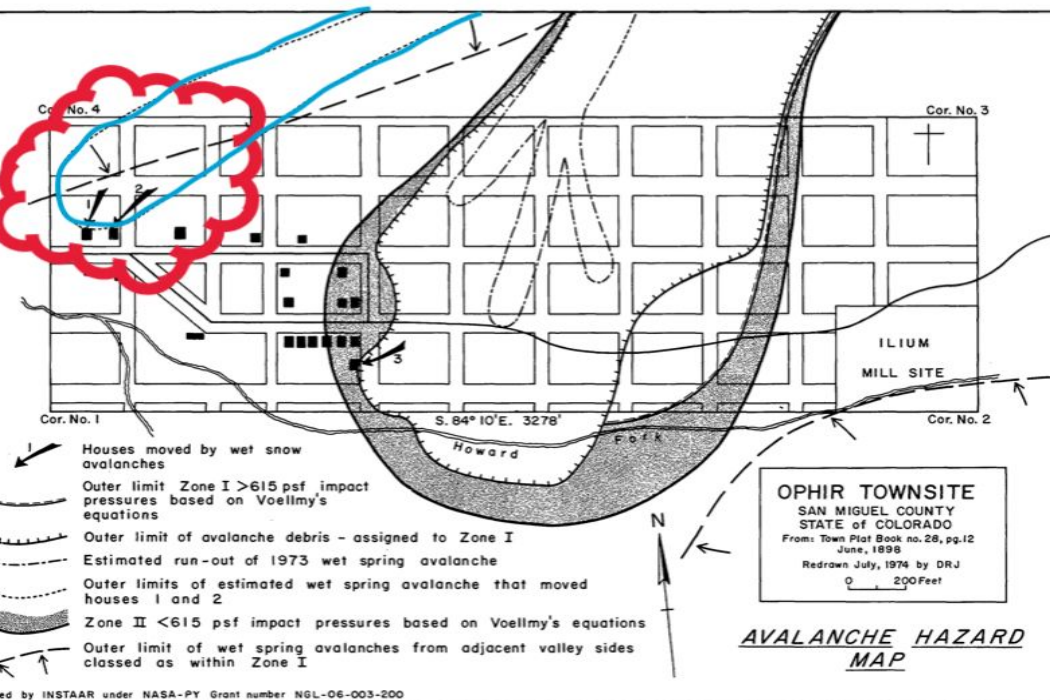


FIG. 10. Detailed avalanche hazard map, Ophir

Conclusions

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2. The official map does not properly designate as "High Hazard" the "Zone I" area at the northwest corner of the platted town that is affected by wet snow avalanches originating on the steep slopes north of the subject property. This particular hazard corresponds to one of the Group 3 avalanches in Figure 2.

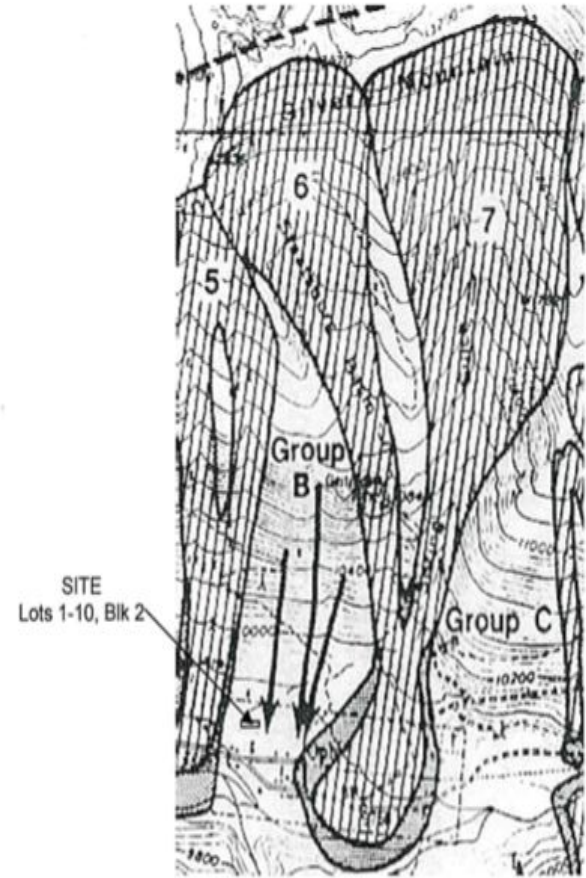
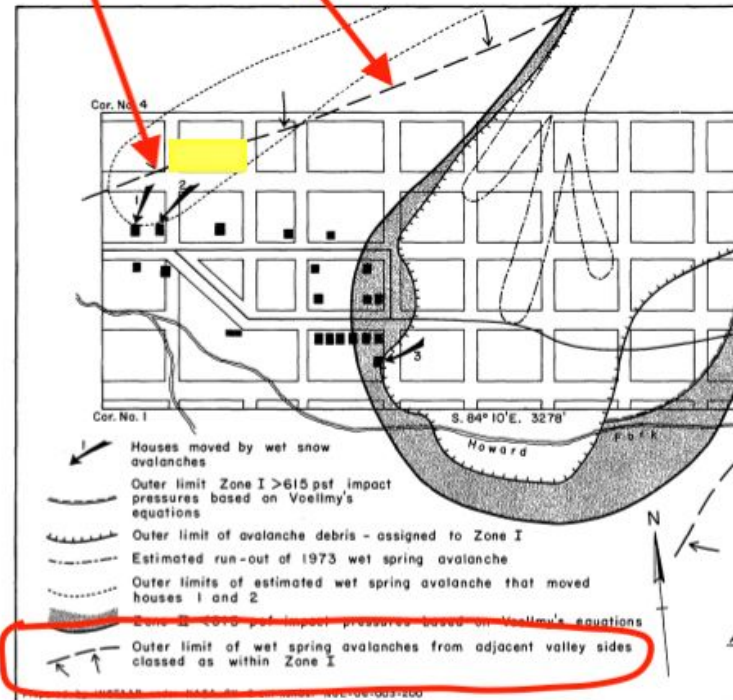


Figure 2 – Colorado Geological Survey Hazard Map

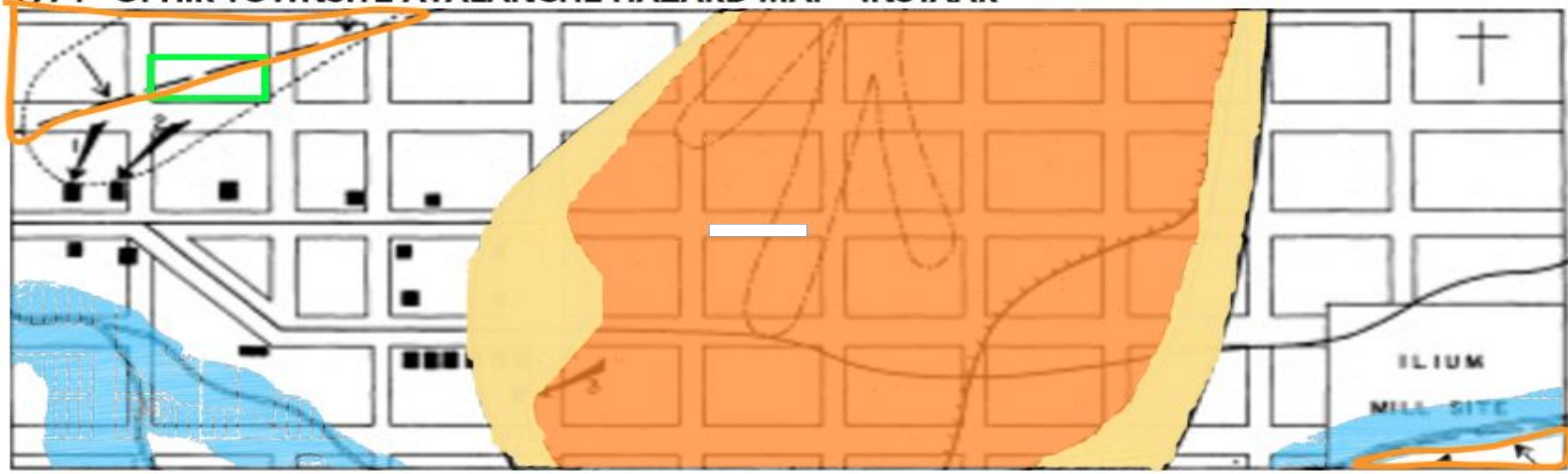


Outer limit of wet spring avalanches from adjacent valley sides
classed as within Zone I

1974 - OPHIR TOWNSITE AVALANCHE HAZARD MAP - INSTAAR



1974 - OPHIR TOWNSITE AVALANCHE HAZARD MAP - INSTAAR



Group B avalanche paths classed as
within Zone 1

House #1
House #2

Ophir

Staatsburg Avalanche path

Group B Avalanche paths

House #1

House #2

Ophir

Andrew W

Conclusions :

1. From the information gathered it is reasonable to conclude that significant avalanche hazard potential threatens lots 1-10 of block 2, Ophir, Co.
2. The classification of the area/path/track of the avalanche that moved 2 houses in NW corner of Ophir in recent history, as “High Hazard”, was done when the 1994 Hazard map was adopted based on information obtained from the 1974 INSTAAR map.
3. The areas in the NW corner and SW corners of Ophir were incorrectly classified as “Moderate Hazard” on the 1994 map and should be adjusted to reflect the “High Hazard Zoning” as shown on the 1974 INSTAAR map.

Mears and Wilbur

P wyne photo

Engineering and Land Use Planning for Snow Avalanches

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[Acceptable Risks](#)

[CGS Bulletin 49](#)

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Modeling](#)

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Wet avalanches might become more common in a warming climate.



TOWN OF OPHIR, COLORADO

ORDINANCE NO. 2023-01

**AMENDING TOWN OF OPHIR LAND USE CODE
APPENDIX C - TOWN OF OPHIR HAZARDS MAP
TO REMOVE LOTS 1-10, BLOCK 2 FROM THE HAZARD AREA**

WHEREAS, pursuant to Colorado Revised Statutes § 31-15-401 and 31-23-301, *et seq.* as a Colorado municipality, the General Assembly of the Town of Ophir hereby ordains to enact regulations necessary to provide public health, safety and welfare of the community specifically to regulate the use of land: and

WHEREAS, the General Assembly recognizes the importance in eliminating the inaccurate inclusion of Lots 1-10, Block 2 in the High Hazard Area: and

WHEREAS, information provided by property owner adequately verifies the inaccurate inclusion of Lots 1-10, Block 2 in the High Hazard Area: and

WHEREAS, the General Assembly acknowledges Lots 1-10, Block 2 is zoned residential - Appendix C Town of Ophir Zoning Map: and

WHEREAS, the General Assembly acknowledges information provided by property owner has satisfied the requirements of:

§1415. REVIEW STANDARDS FOR CODE AND MAP AMENDMENTS.

The Planning and Zoning Commission may recommend approval, and the General Assembly may approve or conditionally approve an amendment to the Land Use Code, the Official Zone District Map, the Official Hazards Map, or other such maps as the Town has adopted under this Article, when it finds that any three of the following criteria have been met:

C. There is demonstrated to be a material and substantial error in the existing zoning map or LUC text, the correction of which justifies the proposed amendment. There was and is insufficient evidence that two residential structures below the Applicant's property were moved by a wet slab avalanche (of unknown date) as depicted in Figure 10 of the INSTAAR report.

D. The proposed amendment is in conformance with or would implement the Ophir Master Plan, as amended.

E. The area proposed to be rezoned or reclassified with regard to a hazard overlay is peculiarly suitable for the uses permitted in the proposed new zone district or districts

WHEREAS, the General Assembly recognizes the property owner has fulfilled all requirements of *Town Of Ophir Land Use Code - Article XIV Land Use Code Amendments And Zoning Changes*: and

WHEREAS, the General Assembly proclaims Ordinance 2023-01 is exclusive to Lots 1-10, Block 2.

NOW, THEREFORE, BE IT ORDAINED BY THE GENERAL ASSEMBLY OF THE TOWN OF OPHIR:

Section 1. Remove Lots 1-10, Block 2 from the High Hazard Area - Land Use Code Appendix C - Town of Ophir Hazards Map.

Section 2. EFFECTIVE DATE. This Ordinance shall take effect upon publication of notice of final adoption.

Section 3. SEVERABILITY. If any one or more sections or parts of this Ordinance is adjudged unenforceable or invalid by a court of competent jurisdiction, such judgment shall not affect, impair, or invalidate the remaining provisions of this Ordinance, the intention being that the various provisions herein are severable.

Section 4. REPEALER. All ordinances, resolutions or parts of ordinances or resolutions inconsistent herewith are hereby repealed to the extent only of such inconsistency. This repealer shall not be construed to revive any ordinance or resolution or part of any ordinance or resolution heretofore repealed.

Section 5. INDEMNIFICATION. This Ordinance is conditioned upon the Applicant's and property owners' written agreement to the following indemnification requirement. The property owner, on behalf of itself and its successors-in-interest, agree to indemnify and hold harmless and release the Town of Ophir, Town of Ophir boards and commissions, its officials, employees, attorneys, insurers and authorized agents, from and against any and all damages, costs, expenses, losses, claims, or liability asserted by any person for damage or destruction to property, injury or death arising out of or resulting directly or indirectly from (a) the construction, development, use or occupancy of all single family dwelling and/or accessory buildings.

Introduced, Read and Approved on First Reading by the General Assembly on the _____ day of _____, 2023.

Approved and Adopted on Second and Final Reading by the General Assembly of the Town of Ophir on the _____ day of _____, 2023.

By: _____
Mason Osgood, Mayor

Attest: _____
Town Clerk

Approved as to Form: Town Attorney



RC View NSS: Shelter Site Information

Disaster Cycle Services Job Tools
Response / Sheltering / RC View NSS

Shelter Site Information

Information on the Shelter Site is entered into the Shelter Facility Manager Map/Facility Site record using the Smart Editor.

- Shelter Site information is collected once per Facility Site regardless of the number of Shelter Buildings attached to a Shelter Site.
- Fields may be slightly out of order from the Smart Editor. If so, they are marked with a plus (+)
- Mandatory Fields are marked with an asterisk (*)

Section 1 – Basic Shelter Site Information

Site ID*: _____

Site Name*: _____

Management Type (used only when opened): _____

Intended Management Type*: ☐ ARC Managed ☐ ARC Partner ☐ Independent ☐ Unknown

Agency Sub-Type (Required if ARC partner selected)*:

☐ Emergency Management Partner

☐ Government Partner

☐ Non-Government Partner

Address*: _____

City*: _____ State*: _____ Zip*: _____

County +*: _____

Hub: _____

Agreement Date: _____

24-Hour ARC Contact: _____ 24-Hour ARC Contact Phone: _____

Built Early (Before 1994)

☐ Yes ☐ No

Phone (Facility): _____ Phone Extension (Facility): _____

Fax (Facility): _____

Section 2 – POC to Authorize Use of the Shelter Facility

First Name of Authorizing POC*: _____

Last Name of Authorizing POC*: _____

Title of Authorizing POC*: _____

Authorizing POC Phone*: _____ Authorizing POC 24 Hr Phone*: _____

Authorizing POC Fax: _____

Authorizing POC Email: _____

Authorizing POC Notes: _____

The American National Red Cross (“Red Cross”), a non-profit corporation chartered by the United States Congress, provides services to individuals, families and communities when disasters strike. The disaster relief activities of the Red Cross are made possible by the American public who support the Red Cross with generous donations. The Red Cross’s disaster services are also supported by facility owners who permit the Red Cross to use their buildings as shelters and other service delivery sites for disaster victims. This agreement is between the Red Cross and a facility owner (“Owner”) so the Red Cross can use the facility to provide services during a disaster. This agreement only applies when Red Cross requests use of the facility and is managing the activity at the facility.

Parties and Facility

Owner:

Full Name of Owner	
Address	
24-Hour Point of Contact Name and Title Work Phone Cell Phone	
Address for Official Notices (only if different from above address)	

Red Cross:

Chapter Name	American Red Cross of Western Colorado
Chapter Address	506 Gunnison Ave., Grand Junction, CO 81501
24-Hour Point of Contact Name and Title Work Phone Cell Phone	24-Hour On Call 970-242-4851, Option 1 OR Courtney Strother, Senior Disaster Program Manager 970-406-0641
Address for Official Notices	American Red Cross, Disaster Cycle Services Logistics, 8550 Arlington Blvd., Fairfax, VA 22031

Facility:

Insert name and complete street address of building or, if multiple buildings, write “See attached facility list,” and attach facility list, including complete street address of each building that is part of this agreement. If the Red Cross will use only a portion of a building, then describe the portion of the building that the Red Cross will use.

Terms and Conditions

1. **Use of Facility:** Upon request and if feasible, Owner will permit the Red Cross to use and occupy the Facility on a temporary basis to conduct emergency, disaster-related activities. The Facility may be used for the following purposes (both parties must initial all that apply):

Facility Purpose	Owner Initials	Red Cross Initials
Service Center (Operations, Client Services, or Volunteer Intake)		
Storage of supplies		
Parking of vehicles		
Disaster Shelter		

2. **Facility Management:** The Red Cross will designate a Red Cross official to manage the activities at the Facility ("Red Cross Manager"). The Owner will designate a Facility Coordinator to coordinate with the Red Cross Manager regarding the use of the Facility by the Red Cross.
3. **Condition of Facility:** The Facility Coordinator and Red Cross Manager (or designee) will jointly conduct a survey of the Facility before it is turned over to the Red Cross. They will use the first page of the Red Cross's **Facility/Shelter Opening/Closing Form** to record any existing damage or conditions. The Facility Coordinator will identify and secure all equipment in the Facility that the Red Cross should not use. The Red Cross will exercise reasonable care while using the Facility and will not modify the Facility without the Owner's express written approval.
4. **Food Services** (*This paragraph applies only when the Facility is used as a shelter or service center.*): Upon request by the Red Cross, and if such resources are available, the Owner will make the food service resources of the Facility, including food, supplies, equipment and food service workers, available to feed the shelter occupants. The Facility Coordinator will designate a Food Service Manager to coordinate meals at the direction of and in cooperation with the Red Cross Manager. The Food Service Manager will establish a feeding schedule and supervise meal planning and preparation. The Food Service Manager and Red Cross Manager will jointly conduct a pre-occupancy inventory of the food and food service supplies before the Facility is turned over to the Red Cross. When the Red Cross vacates the Facility, the Red Cross Manager and Facility Coordinator or Food Service Manager will conduct a post-occupancy inventory of the food and supplies used during the Red Cross's activities at the Facility.
5. **Custodial Services** (*This paragraph applies only when the Facility is used as a shelter or service center.*): Upon request of the Red Cross and if such resources are available, the Owner will make its custodial resources, including supplies and workers, available to provide cleaning and sanitation services at the Facility. The Facility Coordinator will designate a Facility Custodian to coordinate these services at the direction of and in cooperation with the Red Cross Manager.
6. **Security/Safety:** In coordination with the Facility Coordinator, the Red Cross Manager, as he or she deems necessary and appropriate, will coordinate with law enforcement regarding any security and safety issues at the Facility.
7. **Signage and Publicity:** The Red Cross may post signs identifying the Facility as a site of Red Cross operations in locations approved by the Facility Coordinator. The Red Cross will remove such signs when the Red Cross concludes its activities at the Facility. The Owner will not issue press releases or other publicity concerning the Red Cross's activities at the Facility without the written consent of the Red Cross Manager. The Owner will refer all media questions about the Red Cross activities to the Red Cross Manager.
8. **Closing the Facility:** The Red Cross will notify the Owner or Facility Coordinator of the date when the Red Cross will vacate the Facility. Before the Red Cross vacates the Facility, the Red Cross Manager and Facility Coordinator will jointly conduct a post-occupancy inspection, using the second page of the *Shelter/Facility Opening/Closing Form*, to record any damage or conditions.

9. Fee (*This paragraph does not apply when the Facility is used as a shelter. The Red Cross does not pay fees to use facilities as shelters.*): Both parties must initial one of the two statements below:
- Owner will not charge a fee for the use of the Facility.
Owner initials: _____ Red Cross initials: _____
 - The Red Cross will pay \$_____ per day/week/month (circle one) for the right to use and occupy the Facility. Owner initials: _____ Red Cross initials: _____
10. Reimbursement: Subject to the conditions in paragraph 10(e) below, the Red Cross will reimburse the Owner for the following:
- Damage to the Facility or other property of Owner*, reasonable wear and tear excepted, resulting from the operations of the Red Cross. Reimbursement for facility damage will be based on replacement at actual cash value. The Red Cross, in consultation with the Owner, will select from bids from at least three reputable contractors. The Red Cross is not responsible for storm damage or other damage caused by the disaster.
 - Reasonable costs associated with custodial and food service personnel and supplies* which would not have been incurred but for the Red Cross's use of the Facility. The Red Cross will reimburse at per-hour, straight-time rate for wages actually incurred but will not reimburse for (i) overtime or (ii) costs of salaried staff.
 - Reasonable, actual, out-of-pocket costs for the utilities indicated below*, to the extent that such costs would not have been incurred but for the Red Cross's use of the Facility. (Both parties must initial all utilities that may be reimbursed by the Red Cross):
- | | Owner Initials | Red Cross Initials |
|----------------|----------------|--------------------|
| Water | | |
| Gas | | |
| Electricity | | |
| Waste Disposal | | |
- The Owner will submit any request for reimbursement to the Red Cross within 60 days after the occupancy of the Red Cross ends. Any request for reimbursement must be accompanied by supporting invoices. Any request for reimbursement for personnel costs must be accompanied by a list of the personnel with the dates and hours worked.
 - If the disaster is a Federally-declared disaster and Owner is a municipal or state government entity, then the Owner will work with appropriate emergency management agencies to seek cost reimbursement through the Federal Emergency Management Agency's program for administering Public Assistance Category B under the Robert T. Stafford Act. The Red Cross is not obligated to reimburse the Owner for costs covered by Public Assistance Category B.
11. Insurance: The Red Cross shall carry insurance coverage in the amounts of at least \$1,000,000 per occurrence for Commercial General Liability and Automobile Liability. The Red Cross shall also carry Workers' Compensation coverage with statutory limits for the jurisdiction within which the facility is located and \$1,000,000 in Employers' Liability.
12. Indemnification: The Red Cross shall defend, hold harmless, and indemnify Owner against any legal liability, including reasonable attorney fees, in respect to claims for bodily injury, death, and property damage arising from the negligence of the Red Cross during the use of the Facility.
13. Term: The term of this agreement begins on the date of the last signature below and ends 30 days after written notice by either party.



Facility Use Agreement

Digital Signature: Each party agrees that either party's execution of this agreement by DIGITAL signature (whether ELECTRONIC or encrypted) is expressly intended to authenticate this AGREEMENT and to have the same force and effect as manual signatures. The term DIGITAL signature means any electronic sound, symbol, or process attached to or logically associated with a record and executed and adopted by a party with the intent to sign such record, including facsimile or email electronic signatures. The use of digital signatures is intended to facilitate more efficient execution and delivery of signed documents.

The American National Red Cross

Owner (Legal Name)

(Legal Name)

By (Signature)

By (Signature)

Name (Printed)

Name (Printed)

Title

Title

Date

Date

Section 3 – Alternate POC to Authorize the Facility

Alternate First Name: _____

Alternate Last Name: _____

Alternate Title: _____

Alternate Phone: _____

Alternate 24 Hr Phone: _____

Alternate Fax: _____

Alternate Email: _____

Alternate Notes: _____

24-Hour Chapter Contact: _____

24-Hour Chapter Contact Phone: _____

Section 4 – Geographic Information

Shelter Is Suitable for Evacuation: ☐ Yes ☐ No

Elevation (ft above sea level): _____

Site is in Risk Area: ☐ Yes ☐ No

Site is in Storm Surge/Tsunami zone: ☐ Yes ☐ No

Site is in Hurricane Evacuation Area: ☐ Yes ☐ No

Site is in Wildfire Area: ☐ Yes ☐ No

Site is in Earthquake Zone: ☐ Yes ☐ No

Site is near Hazardous Material: ☐ Yes ☐ No

Site is in Tornado Area: ☐ Yes ☐ No

In Cat4 Surge Area +: ☐ Yes ☐ No

Can Become Isolated +: ☐ Yes ☐ No

Reachable by Vehicle +: ☐ Yes ☐ No

On Barrier Island +: ☐ Yes ☐ No

Facility is near nuclear facility +: ☐ Yes ☐ No

In Flood Plain: ☐ Yes ☐ No

Flood Zone Year: _____

Site is in Flash Flood Zone: ☐ Yes ☐ No

Lacks Transportation Options: ☐ Yes ☐ No

Landmarks: _____

Section 5 – Groups Associated with Facility and Training

Personnel Required +:	<input type="checkbox"/> Yes <input type="checkbox"/> No
Feeding Staff Required:	<input type="checkbox"/> Yes <input type="checkbox"/> No
Payment required for feeding staff:	<input type="checkbox"/> Yes <input type="checkbox"/> No
Security Staff Required:	<input type="checkbox"/> Yes <input type="checkbox"/> No
Payment required for security staff:	<input type="checkbox"/> Yes <input type="checkbox"/> No
Other Facility staff or auxiliary:	<input type="checkbox"/> Yes <input type="checkbox"/> No
Payment required for other staff:	<input type="checkbox"/> Yes <input type="checkbox"/> No
Trained Facility Staff:	<input type="checkbox"/> Yes <input type="checkbox"/> No
Facility staff has requested training:	<input type="checkbox"/> Yes <input type="checkbox"/> No

Section 6 – Other Information

Mailing Address: _____

Mailing Address City: _____

Mailing Address State: _____

Mailing Address Zip: _____

URL of Facility Website: _____

Facility Category*:

☐ Campground ☐ Community Center ☐ Educational Institution ☐ Event Venue

☐ Fairground ☐ Faith-based facility ☐ Fire station ☐ Hall ☐ Other

☐ Residential Housing Community Center

Other Population Type: _____

Facility Owner: _____

FEMA 361: ☐ Yes ☐ No

4496 Exempted: _____

Section 7 - Attachments

Agreement (Upload copy of the Agreement into the Facility Site table)