

# **Attachment 7**

Arthur I. Mears Supplemental Avalanche Hazard Analysis

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RE: MAMMOTH LAKES AVALANCHE ISSUES – PLUM SUBDIVISION

1. Objectives – This report is provided to summarize my analysis and conclusions regarding avalanche-hazard change from the proposed Plum Vesting Tentative Parcel Map/Use Permit 10-001 subdivision project. It also provides an analysis of and my response to comments submitted in response to the Project Initial Study/Mitigated Negative Declaration with respect to avalanche concerns. My conclusions in #4 have been based on documents listed in #2 (below), my previous site work in Mammoth Lakes and experience in avalanche terrain and with unstable snowpack conditions worldwide. Site-specific limitations to this study are in Section 5. This report has been completed at the request of the Town of Mammoth Lakes.
2. Documents reviewed through February 19, 2011 – In accordance with the objectives of my consulting agreement "...consulting services for the Plum Vesting Tentative Parcel Map/Use Permit 10-001," I have reviewed the following documents.
  - a. My report to Mr. Craig Tackabery and Mr. William Taylor "Avalanche Hazard Change Resulting from "The Bluffs," Mammoth Lakes, California – With Mitigation Recommendations," dated May 3, 1997;
  - b. My report to Mr. Michael J. Miller of Stoney-Miller Consultants, "Avalanche mitigation analysis, Tamarack Road Lots, Mammoth Lakes, CA," dated November 4, 2003;
  - c. An independent review by EIP Associates, "Independent Review of Subsequent Avalanche Hazard Analysis Prepared For The Plum Tentative Parcel Map (36-203) in the Town of Mammoth Lakes," dated March 3, 2006;

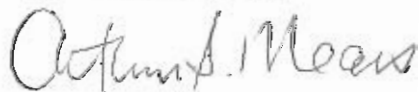
- d. A review of previous work and analysis prepared by Larry Heywood for Terry Plum, "Plum Property Avalanche Hazard Analysis and Comments," dated January 20, 2006;
  - e. A report by Larry Heywood to Terry Plum "Plum Family Bluffs/Tamarack Street Properties Avalanche Hazard Assessment and Comments," dated April 23, 2010;
  - f. An "Exhibit 01" by triad/holmes associates dated "04/05/10" showing a 4' wide public pedestrian easement and tentative locations of 5 future residences "01" through "05;"
  - g. An "Exhibit 02" by triad/homes associates also dated "04/05/10" showing a future upper building site "06" and a 30% slope line;
  - h. A conceptual site plan "VESTED TENTATIVE PARCEL MAP NO. 10-001" showing plans to subdivide the "Plum LLA Parcel 3" into 4 lots (terrain also shown on "f" and "g" above);
  - i. The Bluff EIR Section N (avalanche hazard potential);
  - j. Town of Mammoth Lakes Ordinance 97-13 and zoning code amendment 97-3 (Snow Deposition Design zone);
  - k. An Initial Study/Mitigated Negative Declaration dated November 29, 2010 prepared by the Town of Mammoth Lakes for the Plum Vesting Tentative Parcel Map/Use Permit 10-001 Project
3. Analysis. The documents in "2" have been reviewed because they all are related to avalanche hazards present in the Bluffs. Therefore, they consequently also pertain to analysis of potential avalanche hazard related to the proposed subdivision of the Plum "LLA Parcel 3" into four lots which have been made available by the Town of Mammoth Lakes for my review. Conclusions of my review and analysis follow in #4 and are supported by the following: (a) the proposed Plum development is located approximately 300 – 1000 feet southeast of avalanche starting zones; (b) this distance minimizes the effect of shock propagation through the snowpack (e.g. from roof slides) to the avalanche starting zones; (c) the avalanche paths support a timber cover that (i) inhibits slab fracture propagation and (ii) causes an uneven snow distribution under the tree canopy; (d) the uneven snow under the forest inhibits the formation of widespread and continuous weak layers (e.g. surface hoar, near-surface facets; continuous ice lenses) that would be needed for long slab fracture propagations; (e) any thermal effects near the buildings (e.g.. from heating, solar reflections) occur immediately adjacent to the buildings.
4. Conclusions
- a. ***Subdivision of the Plum parcel into the 3 lower lots will not increase the avalanche hazard to adjacent lots or houses below The Bluffs. Hazard resulting from construction of the lower Plum lots should not increase as a result of building heating, wind-drift effects, snow sliding from roofs or any vibrations that may be associated with the use of these buildings during the snow and avalanche season. However, any buildings planned within the indicated avalanche paths***

**must be reinforced or otherwise protected as directed in previous reports. If building positions or orientations are changed but remain within the designated avalanche areas the loading criteria may change.**

- b. **The upper Plum site (accessed from the Bluffs and adjacent and within a small portion of the >30% slope), should also comply with Town of Mammoth Lakes ordinances and restrictions. If these restrictions are followed, a house on this site will not increase the avalanche hazard to adjacent lots or houses below The Bluffs. Hazard to buildings on the lower lots should not increase as a result of building heating, wind-drift effects, snow sliding from the roof or any vibrations that may be associated with the use of the upper site during the snow and avalanche season. The Project also does not propose to remove trees in the avalanche starting zones and the extent of tree removal proposed below the bluff that would occur with construction of the proposed home sites or access improvements would not pose an increased avalanche hazard.**

5. Site-specific Limitations. I understand that the current project proposal does not propose to develop/construct any buildings on the individual parcels at this time, however the approximate locations of future home sites and related improvements has been provided for my analysis and my findings are based upon this information. I also understand that the further analysis of the design and orientation of future structures will be required prior to development of the parcels to ensure that they adhere to the requirements and mitigation measures of all applicable avalanche hazard analyses. If substantial changes to building positions and/or orientations or if the accesses to these buildings are substantially changed, this could change the conclusions stated in 4a and 4b.

Report prepared by,



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Avalanche-control engineer