LARRY HEYWOOD
SKI AND SNOW CONSULTANT
P.O. BOX 222
HOMEWOOD, CA 96141
Tel & fax 530 525 1077
Email: larryheywood@sbcglobal.net

April 23, 2010

Re: Plum Family Bluffs/Tamarack Street Properties
Avalanche Hazard Assessment and Comments

Dear Mr. Plum:

I have previously reported on your Bluffs Tamarack Street properties in January 2006 and December 2007. Those reports (including all other documents referenced therein) are incorporated as integral parts of this report. You have now requested I analyze your current proposal to develop 6 single family residential dwelling sites (1 off Leverne Street in the Bluffs subdivision and 5 between existing Tamarack Street and the U.S. Forest Service ("USFS") lands) on your 5.6 acres of properties as illustrated in the 2 attached Triad/Holmes Associates maps dated 4/5/2010 titled Proposed 4' Wide Public Pedestrian Access Easement and Upper Building Site 30% Slope Line respectively (the "Triad Maps"). First, your current proposal does not change in any way my assessments or comments in my 2 previous reports.

BUILDING IN THE AVALANCHE RUNOUTS OFF THE TAMARACK STREET EXTENSION

In his 1997 Avalanche Report to the Town of Mammoth Lakes ("ToML"), Art Mears provided a map which identified the Design Magnitude Avalanches (100 year return interval) from the Bluffs area, which are delineated on the Triad Maps. As noted in my January 2006 report, Mears provided a site specific avalanche analysis on your property in November 2003 detailing the Design Magnitude Avalanche requirements for designing (such as avalanche impact loads) and constructing structures within the avalanche runouts.

The 5 residences off the Tamarack Street extension must be designed and constructed to withstand the expected avalanche impact loads as provided by Mears, thereby eliminating most of the avalanche risk to the inhabitants and users of those properties since inhabitants and persons accessing the residences will either be outside of the avalanche area or inside of or below the structure designed to withstand the expected maximum avalanche impact.

The proposed pedestrian access trail along the easterly edge of your properties from the public parking spaces to the USFS lands to the south is mostly outside the avalanche runouts below the Bluffs. Although the proposed trail crosses a section of an avalanche runout, it's much safer from avalanche risk than the current public practice of crossing your property unprotected further to the west.

BUILDING IN THE SNOW DEPOSITION DESIGN ("SDD") ZONE

The 1 residence off Leverne Street in the Bluffs subdivision will be constructed within the ToML's SDD zone. The intent of the SDD zone was to limit development on the Bluffs that might increase snow deposition into the avalanche starting zones to the north and east of the Bluffs that might increase the avalanche risk to other properties below.

However, properly placed structures within the SDD zone will in fact decrease both the frequency and size of avalanches which originate from the paths below the Bluffs. This would result from the tendency of wind transported snow to be deposited in the vicinity of and especially downwind of objects. If structures are placed an appropriate distance from starting zones, snow that may have been blown into and deposited in the starting zone will be deposited near the structures. I have worked on a number of residential plans in the Bluffs where the ToML has permitted structures (including the immediately adjacent lot # 55) within the SDD zone based on this premise. Proper orientation and placement of structures in this area is critical so as not to cause greater that natural snow deposition in the starting zones. Generally, the ToML has approved structures which meet the following criteria:

> Structures should be located a minimum of 30 feet to the windward of the point at which the slope steepens to 30 degrees. Structures should be located a minimum of 1.5 times their height above grade to the windward of the point at which the slope steepens to 30 degrees. Should the structures be multilevel, each level should conform to this 1.5 times factor. In some instances, and only after a more rigorous investigation, it may be possible to build closer to the 30 degree point.
>
> Roof, walkways and driveways should be located or positioned such that shedding snow or plowed snow is not directed towards the starting zones.

Based upon the ToML's past approvals, a structure which meets these criteria should be approved.

If you have any questions or need any additional information, please contact me.

Respectfully submitted,

Larry Heywood

Larry Heywood