

August 7, 2013

Valley Investments, LLC c/o Great Basin Engineering, Inc. PO Box 150048 Ogden, UT 84415

Attention:

Mark Babbitt

EMAIL: markb@greatbasinengineering.com

Subject:

Slope Stability Concerns - Lots 58 and 59

Proposed Phases 7 and 8, The Chalets at Ski Lake

Hummingbird Point and Hawks Lane

Weber County, Utah Project No. 1120924

#### Gentlemen:

Applied Geotechnical Engineering Consultants, Inc. was requested to address stability concerns associated with Lots 58 and 59 in Phase 8 of The Chalets at Ski Lake located Hummingbird Point and Hawks Lane in Weber County, Utah. We previously performed a geotechnical investigation for Phases 7 and 8 of the subdivision and presented our findings and recommendations in a report dated July 23, 2013 under Project No. 1120924.

### **BACKGROUND**

The site is located in an area underlain by Norwood Tuff, which is a volcanic rock that commonly weathers to high plastic clay. Stability is a major concern for many areas underlain by the Norwood Tuff and the soil developed from this bedrock as evidenced by many slope failures on Old Snowbasin Road and on hillsides throughout the area. These slope failures commonly occur where natural slopes erode or cut or fill slopes are constructed steeper than approximately 4 horizontal to 1 vertical.

There is an erosion channel that has developed near the border of Lots 58 and 59 similar to the erosion channel that has developed on Lot 61 where slopes are similar to those on Lots 58 and 59. There are erosion channels developed on Lots 71 and 72 where slopes are significantly steeper.

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A previous study for the subdivision was performed by KPS and Associates and reported January 17, 2002. This report specifically mentions slope stability concerns for Lots 58 and 59, which are designated Lots 43 and 44 at the time of their report. They state, "The drainage between Lots 43 and 44 exhibits hummocky topography near its lower (southeastern) end, and emanates from a slightly depressed area at the northwestern end, which could possibly have a natural spring underneath." They further state, "These issues will have to be addressed appropriately at some later stage, and before development of individual lots in question."

## SITE EVALUATION

Aerial photographs from 1953 and 1986 were reviewed for the area. In addition Google Earth images were used to evaluate the geomorphology of the area. A site reconnaissance was performed by a geologist from AGEC to determine if there is evidence of landsliding in this area.

Aerial photograph review, geomorphology evaluation from Google Earth images and site reconnaissance indicate that this area shows no evidence of landslide.

A test pit (TP-4) was excavated along the border between Lots 58 and 59. This test pit encountered approximately 2 feet of clay overlying gravel and sand extending to a depth of approximately 10½ feet. Clay was encountered below the sand and extended the full depth of the test pit, approximately 14 feet. The sand had a high moisture content suggesting a perched water condition may develop in the sand during wet or snow melt conditions. We anticipate that this sand may be more susceptible to surface erosion and thus the formation of the erosional feature in this area. The orientation of the bedrock in the area would suggest that similar subsurface conditions may be present at Lot 61 where a similar erosion channel has developed.

### **CONCLUSIONS**

It is our professional opinion that the erosional features that have developed on Lots 58, 59 and 61 are not related to previous landsliding in the area. However, slope stability is a significant concern for development of the subdivision and recommendations are provided in the report to help reduce the potential for slope stability concerns.

# **LIMITATIONS**

This letter has been prepared in accordance with generally accepted soil and foundation engineering practices in the area for the use of the client. The conclusions included in the letter are based on conditions observed at the site, subsurface conditions encountered, review of aerial photographs and our experience in the area. Variations in the subsurface conditions may not become evident until additional exploration or excavation is conducted. If the

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subsurface conditions or proposed construction is significantly different from what is described in this letter, we should be notified to reevaluate the recommendations given.

If you have questions or if we can be of further service, please call.

Sincerely,

APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, INC.

8/7(13 No. 260053

**WOUGLAS R** 

ouglas R. Hawkes, P.E., P.G.

Reviewed by SDA, P.E.

DRH/rs