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December 7, 2009

Mr. Sherman Lewis  
Hayward Area Planning Association  
2787 Hillcrest Avenue,  
Hayward, CA 94542

Subject: Proposed Development  
Quarry Village  
APNs: 445017001701, 445017002001, 445017003803, and 445018000100  
Hayward, California  
**COST PROPOSAL FOR GEOLOGY AND GEOTECHNICAL  
INVESTIGATION**  
AGS Proposal No. KI1202

Dear Mr. Lewis:

At your request, we are pleased to submit herein our cost proposal for conducting a preliminary geology/geotechnical investigation for the above referenced site.

## BACKGROUND

The subject property is located at the terminus point of Overlook Avenue in Hayward, California. The property consists of four Parcels (APNs: 445017001701, 445017002001, 445017003803, and 445018000100) owned by Caltrans and are approximately 35.11± acre in total area. The site is bounded by PG &E right-of-way to the east, Carlos Bee Boulevard and residential buildings to the south, residential buildings to the west and Ward Creek to the north. The site with APN 445018000100 (roughly 29.42 acres) was used as a quarry for an unknown period of time and currently is vacant and is covered with grasses in the middle, a hauling road, and several trees along the creek. The remaining parcels are occupied by several single-family one-story wood-framed houses which one or two of them were vacant.

Topographically, the site elevation ranges from 190 feet (Northern America Datum 83, NAD83) at the northeastern portion to 320 feet to the southern portion of the site.

The proposed project is understood to consist of demolishing/moving the existing buildings and developing the site for a total of 270 residential buildings. We understand that at this time, the layout of the residential development area is not known. Hence, we propose to perform our services in three phases, a preliminary geologic investigation phase followed by a preliminary geotechnical investigation phase, and finally design-level geologic/geotechnical investigation phase when building layouts and potential geologic/geotechnical constraints from the preliminary phase are known.

We have reviewed geologic maps published by California Geology Survey (Dibblee, 1980 and 2005). According to the maps, the site underlain by Knoxville Formation to the northern and central portions of the site and Coast Range Ophiolite Complex to the southern portion of the site. The Knoxville Formation consists of gabbro-diorite (gd) of late Jurassic age. The Knoxville Formation consists of clay shale and includes interbeds of greywacke, sandstone and dolomite of late Jurassic and Cretaceous age.

The site is not located within the Alquist--Priolo (AP) Earthquake Fault Zones. However, Dibblee (2005) shows a branch of the Hayward Fault transversing the southern portion of the site. Dibblee (2005) maps this portion of the fault using solid line indicating a high degree of confidence of presence of the fault. The same map shows extension of the Chabot Fault along the creek using dashed line indicating a less degree of confidence on the presence of the fault. The main trace of the Hayward fault is considered active and is located approximately 500 feet to the southwest of the site.

Several previous fault investigation reports performed to the northwest and to the southwest of the site along the main trace of the Hayward fault by Woodward-Clyde Consultants (WCC) in 1977 and 1978. Another fault investigation was performed prior to the WCC study by Judd Hall (JH) on Hayward Fault in this area in 1977. Based on the WCC reports, the main trace of the Hayward fault is active. The other branches correspond with line of surface rupture that accompanied a major earthquake that occurred in 1868. This eastern trace was not seen in the exploratory trenches in the previous work, but was identified on the combined bases of photogeologic evidence, topographic evidence, and abundant evidence of minor deformation along discontinuous clay-filled seams. WCC estimates the eastern lateral extent of the active portion of the Hayward fault approximately 200 feet west of the western boundary of the site. However, no confirmatory trench was excavated.

According to California Geological Survey Landslide Map for the Hayward area, there are portions of several slump/earthflow complex deposits on the sloping portion of the property. At risk properties require detailed engineering geologic investigations.

## SCOPE OF SERVICES

A Register Geotechnical Engineer and a Certified Engineer Geologist have visited the site on February 20 and 22, 2008. Based on our site visit and our literature review, we divide our proposal into four phases.

### Phase 1: Preliminary Geology Evaluation

The purpose of this task is to map the geology of the site including the existing landslides and to evaluate potential geologic constraints on the development. This task consists of:

- a. Review of all available published and unpublished geological literature;
- b. Determine the general geologic and seismic conditions of the site and surrounding area

- c. Preparation of a geology map and preliminary findings report indentifying geologic constraints. We propose to meet with you to discuss the potential impacts the geologic hazards may have on the future planning and layout of the development.

## **Phase 2: Preliminary Geotechnical Investigation**

The purpose of our preliminary geotechnical investigation is to:

- i) Determine the nature and sequence of the subsurface materials; and
- ii) Provide preliminary recommendations for grading, foundations, slab-on-grade construction, retaining walls, pavement, and drainage.

Our scope of work for this Task consists of:

- a. A reconnaissance of the site by the Soil Engineer.
- b. Assessment of general seismic conditions.
- c. Drilling and sampling of the on site subsurface materials using a truck mounted drill rig. A total of five to six borings are proposed to depths ranging from 20 to 30 feet or refusal in the site. Underground Services Alert (USA) will be contacted to assist in locating utilities. The soil cuttings will be spread on site.
- d. Laboratory Testing Program.
- e. Engineering analysis of all data obtained.
- f. Preparation of a written report summarizing our findings, conclusions and preliminary recommendations for the proposed project.

## **Phase 3: Final Geology Evaluation**

During phase 1, we will review all the available reports and maps and photos pertinent to the project location and determine if a confirmatory fault trench is needed. If a fault trench is needed an exploratory program will be developed and after the trench has been excavated, required set-back from the fault traces will be determined. The trench(s) will be sloped and shored to create a safe working environment. Both walls of the trench(s) will be cleaned, logged, and backfilled. The trench(s) may cross pavement, V-ditch and live utilities. We will restore pavement and V-ditch to its pre-excavation condition to maximum extend possible. Utility lines will be protected. Fencing will be placed along the trench to prevent falling into the trench. The trench will be backfilled with engineered fill under observation of our office. The site will be visited by a Certified Engineer Geologist (CEG) and will be performed under the responsible charge of a Certified Engineering Geologist.

If the existing landslides are deep seated, we will prepare a cost estimate for supplemental field investigation during preparation of our design-level geotechnical report. Our supplemental field investigation will involve test pits and soil borings with continuous sampling.

Associated cost for this phase of study, if required, is highly depend on the length of the fault trench and depth of landslide. Due to lack of information at this stage of the study, no cost is provided for this phase.

#### Phase 4: Final Geotechnical Investigation

During phase 2, we will perform preliminary geotechnical investigation and provide preliminary recommendations for grading, foundation options, and pavement. After, the layout of the buildings and pavement finalized, we will perform design-level geotechnical investigation using additional exploratory borings, seismic refraction, and supplemental laboratory testing. Exploratory program will be developed using the available data from Phase 2. Seismic refraction will be performed to evaluate rippability of the bedrock. Associated cost for this phase of study highly depend on the our finding in Phase 2 and proposed area of development. Due to lack of information at this stage of the study, no cost is provided for this phase.

#### FEE

We estimate our total costs for performing the above Phase 1 and Phase 2 work to be \$8,300 as itemized below.

Phase 1 – Preliminary Geology Evaluation		
	Document Review	\$ 400
	Drafting of Geology Plan	\$ 500
	Preliminary Geology Report	\$ 600
	<b>Subtotal</b>	<b>\$ 1,500</b>
Phase 2 – Preliminary Geotechnical Investigation		
	Drill Rig (one day)	\$ 2,500
	Engineering Supervision	\$ 1,000
	Laboratory Testing	\$ 1,400
	Drafting	\$ 200
	Reporting	\$ 1,700
	<b>Subtotal</b>	<b>\$ 6,800</b>
	<b>Total Phase 1 and 2</b>	<b>\$ 8,300</b>

If significant non-uniformity of subsurface conditions is encountered some additional subsurface work may be needed. This will be evaluated immediately after the borings are completed.

The drilling investigation can commence within one week of your authorization to proceed for Phase 2, depending on rig availability and weather conditions. Our written report for Phases 1 and 2 will be transmitted within three to four weeks from completion of the fieldwork. If required, preliminary results could be made available within two to three days after completion of fieldwork.

We will coordinate our services with all professionals involved with the project in order that information may be furnished promptly and in a timely manner.

The above cost is based on one day of the drilling subcontractor's time. If the actual time spent in the field exceeds the assumed length of time, the cost of the study should be adjusted.

The estimated cost also assumes that no significant soil and groundwater contamination will be encountered during field exploration program. If we encounter significant contamination, we will stop the field program and will develop a new scope of work with you based on the level and extent of the contamination encountered.

We appreciate the opportunity to submit this proposal. Please let us know if you have questions or need further information, [415] 777-2166, ext. 18.

Very truly yours,  
**AGS, Inc.**



Kamran Ghiassi, Ph.D., P.E., G.E.  
Senior Geotechnical Engineer

The undersigned agrees to the terms and conditions, set forth in this proposal and authorizes AGS, Inc. to begin work.

CLIENT: \_\_\_\_\_ DATE: \_\_\_\_\_