Google

Address **169 Westgate Drive**

Address is approximate

EXHIBIT NO. 7

APPEAL NO.

A-1-HUM-12-006

SMITH, BRIAN

VIEW FROM WESTGATE DRIVE

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Reference: 010166

February 8, 2011

Mr. Brian Smith
848 Greenwood Heights
Kneeland, CA 95549

Engineer to inspect footing/excavations.

Subject: Geologic Hazard and Engineering-Soils Report for a Proposed New Residence, 183 Westgate Drive, Trinidad, California

Dear Mr. Smith:

This report documents the results of a geologic hazard assessment and geotechnical investigation for a proposed new residence at 183 Westgate Drive, Trinidad (Figure 1). The subject property consists of two adjoining undeveloped parcels, Parcel 1 and Parcel 2 (Figure 2). It is our understanding that the new residence will consist of a single-story wood-framed two-bedroom house, located within the southwest corner of the property. Our investigation and this report are intended to provide findings, conclusions, and recommendations related to geotechnical aspects of project design and construction. This report is also intended to satisfy the requirements of the 2010 California Building Code (CBC) and provide the necessary information to obtain a Humboldt County building permit.

1.0 Introduction

1.1 Site Location

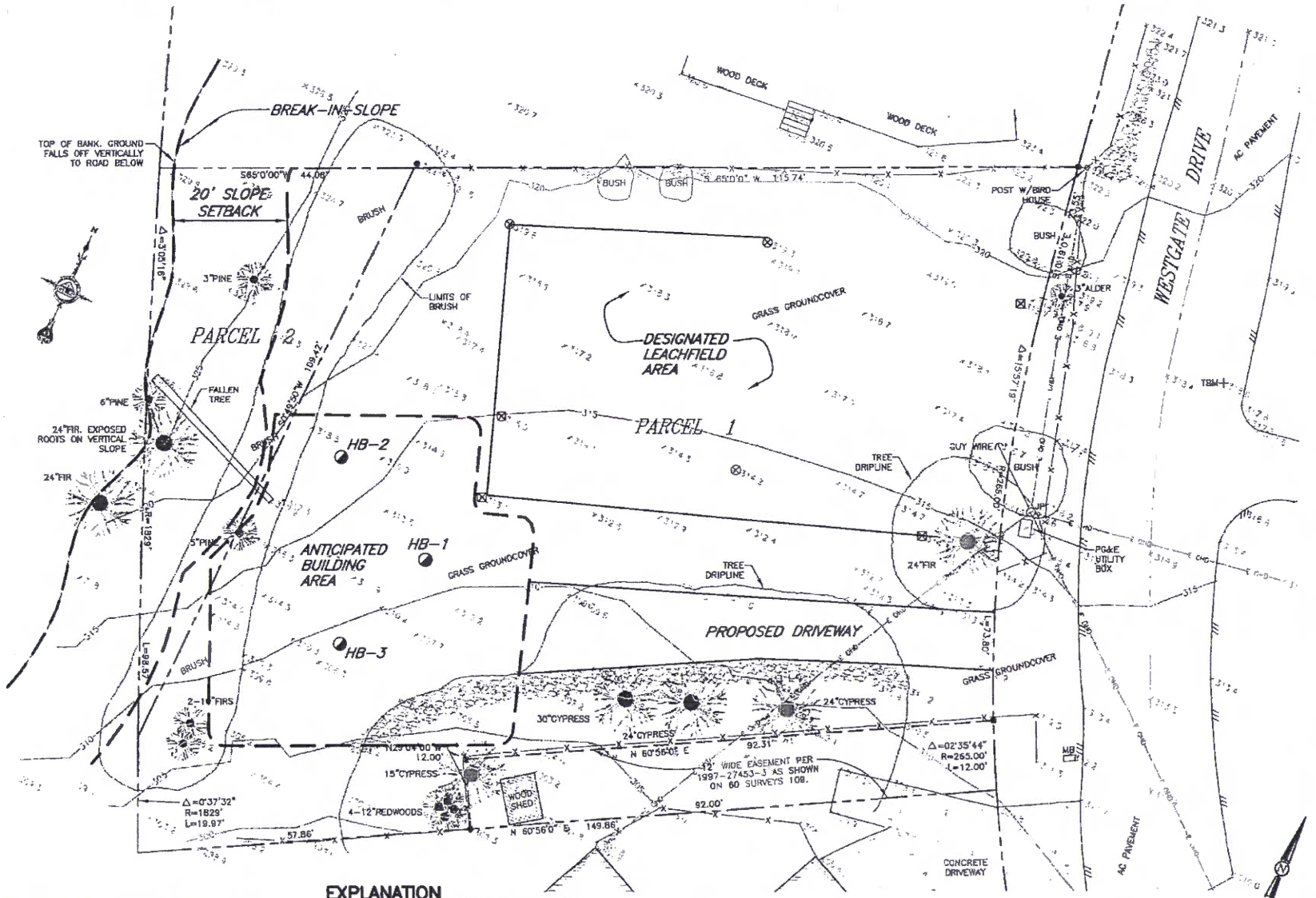
Address: **183 Westgate Drive, Trinidad, California**
Assessor's Parcel Number: **517-231-073**
Latitude and Longitude: **41.0956°, -124.1561°**
The project vicinity is shown on Figure 1.

1.2 Project Description

We understand the project consists of the construction of a new residence within the southwest corner of the property. Previous work on the site includes a subsurface investigation for an on-site sewage disposal system by Tom Brundage. The proposed leachfield is located within the northeast corner of the parcel as indicated on Figure 2. A graded roadway along the southern side of the property will be used as a driveway. Final configuration of the residential structure and garage was still in development at the time of this writing. For the purposes of focusing our investigation, the anticipated location of the structure is within the area indicated on Figure 2. We expect that the structure will be founded on a continuous perimeter spread footing with isolated interior footings. The garage will be supported by a thickened-edge slab-on-grade. We expect that the structure will generally conform to site grades, although some grading will be required for the garage floor.

2.0 Field Investigation and Laboratory Testing

On January 6, 2011, a geologist from SHN conducted a subsurface investigation at the project site. Three hand augered borings, shown as HB-1, HB-2, and HB-3 on Figure 2, were advanced to 6, 3.5, and 5 feet below grade, respectively. Soils observed in cuttings and samples were logged in general accordance with the Unified Soil Classification System. A description of the soil profile is



SOURCE: TOPOGRAPHIC BASE MAP BY GUTIERREZ LAND SURVEY, DATED 12/7/2010

EXPLANATION

◐ GEOTECHNICAL BORING
HB-1 LOCATION AND DESIGNATION

SHN Consulting Engineers & Geologists, Inc.	Smith Residence 183 Westgate Drive Trinidad, California	Site Map with Boring Locations SHN 010166
	January 2011 | 010166-SITE	Figure 2

2011

indicated on the attached hand boring logs (Attachment 1). Selected undisturbed samples were submitted to SHN's materials testing laboratory for analysis. Laboratory testing for index properties included in-place moisture content, dry density, and expansive index. Test results are presented on the hand boring logs.

As part of our field investigation, we also observed the slope on the west side of the property. Our review consisted of a visual inspection, focused on assessment of rock competency, orientation and character of fracturing, weathering, and mechanisms of erosion. We discuss our findings below in Section 3.3 and make recommendations for a building setback in Section 6.3 below.

3.0 Site Conditions

3.1 Geology

The project site is situated on a late Pleistocene-age marine terrace, which underlies much of the area between Trinidad and Patrick's Point. The marine terrace surface has been uplifted by local and regional faults (Figure 3). The closest State-designated active fault to the project site is the Trinidad fault, located approximately 1.5 miles south. The terrace surface consists of shallow marine deposits (primarily silt, clay, sand, and gravel) which unconformably overlie the Cretaceous to Jurassic-age Franciscan Formation (regional bedrock unit). The soils encountered in our borings and in previous test pits are near-shore marine deposits that are draped on the Franciscan bedrock. Regional mapping and correlation between uplift rates and sea level fluctuations have indicated that the marine deposits underlying the project site are late Pleistocene in age.

3.2 Subsurface Conditions

At each of our boring locations, we encountered approximately 1 to 1.5 feet of organic-rich silty topsoil (ML), which graded into medium stiff lean clay (CL). Within HB-1, soils graded into sandy clay at 3.5 feet below grade and continued to a total depth of 6 feet below grade. Previous subsurface investigations conducted by Tom Brundage for the on-site sewage disposal indicate the same general profile with medium dense sand with cobbles at 8.5 feet below grade. The site is underlain by bedrock of the Franciscan Formation at variable depths. The far western portion of the property is underlain by bedrock at or very near the surface and is expected to deepen toward the east end of the property. We encountered bedrock at approximately 3.5 feet below grade within HB-2.

The dark, organic-rich topsoil material is soft and susceptible to settlement under the anticipated structural loads. The native undisturbed soil below the topsoil appears to be suitable for bearing structural loads.

Laboratory testing was conducted on three samples collected from HB-1. Moisture content, dry density, and expansive index tests were run. Moisture contents ranged from 24 to 28 percent, dry densities ranged from 99 to 105 pounds per square foot, and the expansive index of a composite sample (3 to 6 feet below grade) was 37. Laboratory test results are indicated on the hand boring logs (Attachment 1).

Groundwater was not encountered in any of our borings. Groundwater levels during our investigation (January) were likely near the seasonal high. Water levels can be expected to fluctuate in response to seasons, storm events, and other factors, and may become higher than indicated by the subsurface observations made.

From our site investigation and our understanding of site geology and soil conditions, we estimate the site can be categorized as a Site Class D (stiff soil profile) in the upper 100 feet, for determining seismic loads for structural design as outlined in the 2010 CBC. A detailed description of site soils encountered within our boring is presented on the attached hand boring logs (Attachment 1).

3.3 Slope Stability Conditions

The slope on the west side of the property is approximately 60 to 70 feet high, and near vertical in places. The break-in-slope is abrupt and is situated at the crest of a topographic high. The proposed building area as indicated on Figure 2 is generally 5 to 10 feet below the elevation of the break-in-slope. The slope face is part of a remnant cutslope on the east side of Patrick's Point Drive. It is our understanding that some historic rock quarrying may have taken place as well. The rock consists of bedrock of the Franciscan Formation. The bedrock within the lower two-thirds of the slope is highly indurated and generally massive with some thin zones of shear that primarily dips toward the east (into the slope). The upper one third of the slope consists of moderately weathered rock, capped by a thin veneer of Pleistocene-aged alluvial gravels. Two trees are rooted within the alluvial gravels directly on the break-in-slope. The rock appears to be an isolated erosional remnant (low sea stack) with shallow marine alluvium draping the rock on the north, east, and south sides. Very little rocky debris was noted at the base of the slope. The primary mechanism of erosion of the slope face is shallow rock falls. We observed freshly exposed rock in some areas, but none represented significant volumes. Periodic sloughing of small pockets of fractured rock is expected within the economic lifespan of the residence. The upper 8 to 10 feet are considered susceptible to erosion, as it is comprised of sheared bedrock and a thin veneer of alluvial gravels. Deep-seated slides or other types of large failures are not considered likely due to the competency of the bedrock.

4.0 Geologic Hazards

- The principal geologic hazard at the site is strong levels of seismic shaking produced by earthquakes generated on the Trinidad fault (mapped 1.5 miles to the south), the Cascadia Subduction Zone, or other regional sources along the north coast.
- The project site is located approximately 1.5 miles from the Trinidad fault, which is the nearest active fault. The project site is not located within an Alquist Priolo Fault Hazard Zone and the surface rupture hazard is considered negligible.
- The project site is more than 500 feet from any significant streams or rivers and is not within a 100-year flood zone. The flood hazard is considered negligible.
- The subject property is bordered on the western side by a 70-foot rock cliff. This slope presents a slope stability hazard to future developments. The conditions that relate to the stability of this slope are discussed in Section 3.3 above. In our opinion, mitigation of the slope stability hazard can be achieved with an appropriate building setback. Our recommendations are provided in Section 6.3 below.

- Loose cohesionless soils were not observed in our borings or recorded in previous subsurface studies on the site. The predominantly fine-grained alluvial soils on which the structure will be supported are Late Pleistocene in age. Risk of liquefaction and lateral spreading are concluded to be negligible to low.
- No high plasticity clayey soils were identified in the field, indicated by our laboratory test program, or generally expected in the geologic formation underlying the site. An expansive index (EI) test run on a composite sample from the 3- to 6-foot interval in HB-1 indicated an EI of 37. Qualitatively, this value correlates to a low expansion potential; therefore, risk of adverse consequences to the structure from expansive soils is considered low.
- The tsunami risk is considered negligible due to the elevation of the site (approximately 300 feet above mean sea level).

5.0 Conclusions and Discussion

Based on the results of our field and laboratory investigations, it is our opinion that the project site can be developed as proposed, provided that our recommendations are followed, and that noted conditions and risks are acknowledged. With the residence designed and built in accordance with the 2010 CBC and the recommendations within this report, we do not expect the structure to contribute or be subject to substantial geologic hazards throughout the economic life span of the project.

The primary geotechnical site considerations are adequate soil bearing and potential for settlement of the proposed foundation system. The site is underlain by approximately 1 to 1.5 feet (or more) of soft organic-rich topsoil unsuitable for load bearing. We provide recommendations for foundation design below and estimate that with the project constructed in accordance with these recommendations, total post-construction settlement is not likely to exceed one-half inch, with a differential settlement gradient not exceeding one-half inch over 20 feet horizontally.

6.0 Recommendations

Engineer to inspect footing/excavations.

6.1 Seismic Design Criteria

We recommend that the proposed structure be designed and built to withstand strong seismic shaking. The minimum standard for construction of the structure should be in accordance with the 2010 CBC.

Based on the Site Class and the latitude and longitude, we calculated the design spectral response acceleration parameters SS, S1, Fa, Fv, SMS, SM1, SDS, and SD1 using the United States Geological Survey (USGS) seismic calculator program, "Seismic Hazard Curves, Response Parameters, Design Parameters: Seismic Hazard Curves, and Uniform Hazard Response Spectra," v. 5.0.9a, dated October 21, 2009. The resulting design spectral response acceleration parameters are presented in Table 1.

6.2 Site Preparation and Grading

The existing ground surface within the area of our focus (labeled "Anticipated Building Area" on Figure 2) is sloped toward the southwest and is expected to include some site grading. No major cuts or fills have been proposed; however, the precise size and configuration of the residence and garage were not developed at the time of this writing. The garage is expected to require some cut and/or fill to prepare a suitable pad for a slab-on-grade floor. The foundation system for the residence is expected to consist of a series of continuous perimeter and isolated interior spread footings that generally conform to existing topography.

Table 1
Seismic Design Criteria

Latitude	41.0956
Longitude	-124.1561
Site Class	D
S_S	2.801
S_1	1.193
F_a	1.0
F_v	1.50
S_{MS}	2.801
S_{M1}	1.790
S_{DS}	1.868
S_{D1}	1.193
Occupancy Category	II
Seismic Design Category	E

6.2.1 Preparation of Subgrade for Placement of Fill

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Any surface on which structural fill is to be placed should be stripped of topsoil, undocumented fill, and/or any other soft or loose soils. The surface should be graded level or benched (where necessary) and compacted to create a firm non-yielding surface. Proofroll the subgrade with a 10-wheel 10-cubic yard dump truck loaded with gravel, or equivalent. The proofrolling should be accomplished with the soil damp or moist (not wet or dry) and a firm, non-yielding surface should be evident during the proofrolling. If a yielding surface is observed (pumping, weaving under the wheel loads), additionally excavate the yielding area, and replace the over-excavated material with Caltrans specification Class 2 baserock, in a manner that will result in a stable subgrade surface under the proofrolling.

6.2.2 Specifications for Structural Fill

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Structural fill, where required, should consist of relatively non-plastic (Liquid Limit less than 40, Plasticity Index less than 14) material containing no organic material or debris, and no individual particles more than 6 inches across. If gravel is used, it should be well-graded, to include a variety of particle sizes to minimize relatively large void spaces, into which fine grained soils can migrate. We suggest the use of well-graded granular soils (sand, gravel) for fill, because these soils are relatively easy to moisture condition and compact. Soils excavated from the subject site may be reused as structural fill, but should be expected to be difficult to moisture condition.

6.2.3 Specifications for Placement and Compaction of Structural Fill

Engineer to inspect footing/excavations.

Structural fill underlying foundation elements, slabs-on-grade, and other flat work areas should be moisture conditioned, placed in loose lifts no greater than 8 inches and, unless otherwise specified, should be compacted to a minimum of 95% of the maximum relative dry density as determined by the current American Society for Testing and Materials-International (ASTM) D1557 test method.

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6.3 Slope Setback

Our assessment of the stability conditions of the slope on the west end of the property is discussed above in Section 3.2. We consider the areas within 10 feet of the break-in-slope to have a high slope stability hazard, within 10 to 20 feet from the break-in-slope to have a moderate slope stability hazard, and the areas beyond 20 feet from the slope break to have a low slope stability hazard. The 20 foot setback line is shown on Figure 2. We recommend all structures maintain a minimum setback of 20 feet from the break in slope.

6.4 Foundations

Engineer to inspect footing/excavations.

We anticipate the residence to be supported on a continuous perimeter spread footing. The site is sloping, so perimeter footings will need to conform to topography. Excavations for footings that cross grade changes should be stepped. Foundation excavations should extend a minimum of 18 inches into native undisturbed soils, or suitably placed and compacted structural fill. Where foundations bear on undisturbed native soils, we assign a bearing capacity of 2,000 pounds per square foot (psf). Where foundations bear on structural fill (greater than 24 inches in thickness) placed and compacted as specified above, we assign a bearing capacity of 3,000 psf. These bearing values may be increased by one-third to account for the short-term effects of wind and/or seismic (dynamic) loading.

A horizontal friction coefficient of 0.35 may be used for the footing/soil contact. Additional resistance may be calculated with an allowable lateral passive pressure represented by an equivalent fluid weighing 300 pounds per cubic foot for short-term loadings (such as, lateral foundation resistance in response to wind or earthquake loadings).

The ground surface around the structure perimeter should be sloped away, or other design measures should be implemented to provide positive surface water drainage away from perimeter foundation areas.

Engineer to inspect footing/excavations.

6.5 Slab-on-Grade

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We expect the garage floor will consist of a slab-on-grade. The concrete slab-on-grade(s) should be designed to accommodate the anticipated floor loads. The concrete slab should be underlain by at least 6 inches of crushed rock or angular gravel supported by 12 inches of compacted subgrade. Structural fill should be compacted to at least 95% of the maximum dry density in accordance with ASTM D1557.

To minimize transmission of soil moisture up through floor slabs in occupied areas or where moisture-sensitive floor coverings are used, we recommend that the slabs be underlain by a moisture/vapor barrier manufactured for the purpose. Acceptable products include Moistop 737, TU-TUFF 4 by Sto-Cote Products, or Griffolyn T-65 by Griffolyn Company, or a polyethylene vapor reduction membrane at least 10 millimeters in thickness. The membrane should be overlapped at least 6 inches and taped at joints. This membrane should overlie a combined capillary break and underdrainage blanket consisting of a 4-inch layer of No. 4 U.S. Sieve (0.187 inch) minimum, up to 1-inch maximum, gravel. (A capillary break is provided by a gravel layer with relatively large,

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intergranular, void spaces, which inhibits the capillary rise of ground moisture.) Typically, a thin (2-inch) sand layer is placed over the membrane to protect against tearing or puncture during construction.

Soil subgrade should not be allowed to dry excessively before placing the sub-slab gravel, vapor barrier, and slab. These soils should be moist but not saturated at the time the vapor barrier and slab are placed. They should be maintained in damp to moist condition, which will minimize risk of subsequent swelling or shrinking once the overlying materials are placed.

Engineer to inspect footing/excavations.

6.6 Construction Phase Monitoring

In order to assess construction conformance with the intent of our recommendations, it is important that a representative of our firm monitor the following tasks:

1. subgrade preparation,
2. placement of structural fill, and
3. foundation excavations.

This construction phase monitoring is important because it provides the owner and SHN the opportunity to verify anticipated site conditions, and recommend appropriate changes in design or construction procedures if site conditions encountered during construction vary from those described in this report. It also allows SHN to recommend appropriate changes in design or construction procedures if construction methods adversely affect the competence of on-site soils to support the structural improvements.

7.0 Closure and Limitations

The analyses, conclusions, and recommendations contained in this report are based on site conditions that we observed at the time of our investigation, data from our subsurface explorations and laboratory tests, our current understanding of proposed project elements, and on our experience with similar projects in similar geotechnical environments. We have assumed that the information obtained from our limited subsurface explorations is representative of subsurface conditions throughout the site.

If the scope of the proposed construction, including the proposed loads, grades, or structural locations, changes from that described in this report, our recommendations should also be reviewed.

If there is a substantial lapse of time between the submission of our report and the start of work at the site, or if conditions have changed due to natural causes or construction operations at or adjacent to the site, we should review our report to determine the applicability of the conclusions and recommendations considering the changed conditions and time lapse. This report is applicable only to the project and site studied.

The conclusions and recommendations presented in this report are professional opinions derived in accordance with current standards of professional practice. Our recommendations are tended on the assumption that design and construction of the improvements will conform to their intent. No warranty is expressed or implied.

The field work was conducted to investigate the site characteristics specifically addressed by this report. Assumptions about other site characteristics, such as hazardous materials contamination, or environmentally sensitive or culturally significant areas, should not be made from this report.

This report concludes our work on the project in accordance with our current agreement. If you have any questions, please call 707-441-8855.

Sincerely,

SHN Consulting Engineers & Geologists, Inc.

PROFESSIONAL GEOLOGIST · STATE OF CALIFORNIA · JASON P. BUCK No. 8723 EXP 7/31/12

Jason P. Buck, P.G.
Project Geologist

REGISTERED PROFESSIONAL ENGINEER · RICHARD W. HANFORD GE000874 EXP 3/31/11 · GEOTECHNICAL · STATE OF CALIFORNIA

Richard W. Hanford, G.E.
Senior Geotechnical Engineer

JPB:RWH:lms

Attachment 1. Hand Boring Logs

References Cited

United States Geologic Survey. (October 21, 2009). "Seismic Hazard Curves, Response Parameters, Design Parameters: Seismic Hazard Curves, and Uniform Hazard Response Spectra," v. 5.0.9a. NR:USGS.

United States Geological Survey. (NR). Trinidad, Crannel, and Rodgers Peak 7.5-Minute Quadrangles. NR:USGS.

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Reference: 010166

March 9, 2012

Mr. Brian Smith
848 Greenwood Heights
Kneeland, CA 95549

Subject: **Addendum 1 to "Geologic Hazard and Engineering-Soils Report for a Proposed New Residence, 183 Westgate Drive, Trinidad, California" dated February 8, 2011**

Dear Mr. Smith:

SHN previously prepared a report entitled "Geologic Hazard and Engineering-Soils Report for a Proposed New Residence, 183 Westgate Drive, Trinidad, California," dated February 8, 2011. It is our understanding that the project is going through review at the Humboldt County Planning Department. SHN was asked to comment on concerns expressed at a Planning Commission hearing. The specific concerns we were asked to address include:

- The final project design includes a two-story residence with a daylight basement/garage, whereas our February 8, 2011, report assumed a one-story residence with a daylight basement/garage. Does this affect the conclusions and recommendations provided in the report?
- In our report, we recommended a 20-foot building setback from the cliff edge on the western side of the property. Two, 24-inch fir trees on the cliff edge (roots exposed in face) are planned for removal. Does the removal of these trees affect the recommended building set back?

SHN was also asked to review documentation by Pacific Watershed Associates (PWA) related to the planned on-site wastewater treatment system to determine if any of the proposed improvements associated with the septic system would conflict with our conclusions and recommendations.

Discussion and Conclusions

We reviewed three plan sheets by Cairns Architecture; Sheet A1.1 "Plot Plan," dated January 30, 2012, and Sheets A2.1 "Floor Plans," and A3.1 "Elevations," each dated August 26, 2011. The proposed structure consists of a two-story residence with an offset daylight basement/garage. In our opinion, the change from a single-story to a two-story structure as configured on the above-referenced drawings does not impact the conclusions and recommendations in our February 8, 2011 report. The recommendations provided in Section 6.0 of the report include seismic design, site preparation and grading, slope setback, foundations, and slab-on-grade remain appropriate for a two-story residence. The structure should be designed and constructed in accordance with the 2010 California Building Code and any other relevant regulations as they relate to a two-story residential structure of this type.

The cliff face on the western side of the property is primarily composed of competent bedrock of the Franciscan Formation. A thin mantle of alluvial gravels and sand is present at the top of the cliff. The trees planned for removal are situated on the cliff edge and are rooted in the gravel. Some minor sloughing of soils on the edge can be expected if the stump is removed with the tree, or as the stump decomposes over time. Careful removal of the trees is expected to result in less significant disturbance

to the cliff edge than if they were to fall naturally. In our opinion, the 20-foot setback remains appropriate whether or not the trees are removed.

Significant work has been done by others to assess suitability and develop a design for the on-site wastewater treatment system on the subject property. A summary of the work and related documents is provided in PWA's January 27, 2012, letter report entitled "Onsite Wastewater Treatment System Design for A.P. No.: 517-231-73, located at 183 Westgate Drive, Trinidad, California." In their report, PWA reviews the history of septic suitability investigations conducted at the site, and makes recommendations for a pre-treatment system using an Orenco AdvanTex Treatment System as an alternative to a sand filter pre-treatment system.

Based on our review of PWA's report, and the most recent plot plan by Cairns Architecture, dated January 30, 2012, showing the layout of the septic system, we find the proposed improvements acceptable. The setbacks for grading and foundation excavations do not appear to conflict with the conclusions and recommendations in our report.

Limitations

The conclusions and recommendations presented in this report addendum are professional opinions based on available information and derived in accordance with current standards of professional practice.

This letter is an addendum to our February 8, 2011, geologic hazard and engineering-soils report and should be included with it in applicable regulatory submissions and project files. If you have any questions, please call 707-441-8855.

Sincerely,

SHN Consulting Engineers & Geologists, Inc.

Jason P. Buck, P.G.
Project Geologist

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Richard W. Hanford, G.E. GE000374
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