

March 11, 2006

FILE:GR06Mar.SimonSlope

Mr. & Mrs. Dick Simon  
2960 South Kihei Road, Apt. 601  
Kihei, Maui, Hawaii 96753

RE: *Preliminary Discussion Regarding Slope Instability Issues*  
*Proposed single family residence*  
*15000 Calle Real*  
*Gaviota, California*  
*Assessor's Parcel Number 081-150-28*

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Dear Mr. & Mrs. Simon:

**1. INTRODUCTION**

At your request, I herewith present this summary report that outlines my findings and conclusions regarding potential alternative residential building sites on the subject property. I prepared a detailed **PRELIMINARY GEOLOGIC INVESTIGATION** report dated December 14, 2004 that provided geologic guidance in the technical design for construction of a new single family residence within a specific **BUILDING ENVELOPE** located on a small north-south aligned ridgeline. The local geologic conditions on the subject property and surrounding area are graphically presented on the attached graphic entitled **LOCAL GEOLOGIC MAP** (see Figure 1). This map shows that much of the upper portion of the site underlain by a bedrock unit identified as the Rincon Formation. I have also prepared a more detailed geologic map of the subject property that is the focus of this report entitled **UNSTABLE SLOPE MAP** (see Figure 2). The Building Envelope and other details of the landslide conditions on the property are graphically shown figure 2.

The proposed Building Envelope as shown on these figures was reportedly recommended by Santa Barbara County, Engineering Geologist, Mr. Brian Baca and County staff after numerous consultations and review with your original Engineering Geologist (Mr. Ray Coudray). My December 14, 2004 investigation specifically addressed the geologic suitability of this area for construction of your proposed new residence. In summary, it is my opinion that the area within the Building Envelope as defined on these reports is geologically suitable for construction of a new single family residence, provided the recommendations outlined within my older report and that of your Geotechnical Engineer (Pacific Materials Laboratory) are implemented.

Based on my recent discussions with you regarding this project, it is my understanding that some members of the public have requested that alternative building areas be considered for use as a residential site on the property. During my original geologic assessment of the property in December, 2004, I made a reconnaissance level field analysis of most of the property and concluded that County staff and your Geologic Consultant (Mr. Coudray) made the proper recommendation regarding potential

building areas on the property. I have conducted an additional field mapping exercise with specific focus on attempting to find one (or more) alternative residential building sites that are geologically suitable for construction. My conclusion is that most of the remainder of the property (outside of the existing Building Envelope) is constrained for development because of some or all of the following: steep slopes; ; presence of landslides; presence of deep soil creep associated with the Rincon Formation; inaccessible areas; the requirement of mass grading to create a suitable building pad; riparian and/or wetland issues; and other engineering and environmental issues. .

## **2. FIELD INVESTIGATION**

I spent a total of approximately three hours on the site and surrounding area conducting a new updated field investigation. I also reviewed a large scale aerial photograph of the subject property for the purpose of observing the geomorphic expression of landslide activity. I specifically attempted to map the outline of all of the landslide deposits as exposed from surface and aerial photographic geomorphic expression on the parcel. Typically, geomorphic indicators of dormant and recent landslide activity include the presence of hummocky topographic terrain, oversaturated clay rich soil, bowl shaped topographic features, the presence of anomalous bench like topographic features, springs, soil creep, leaning fence lines, telephone poles and other man-made features, and other lesser indicators that would be familiar to an experienced geologist. I have outlined on the attached **UNSTABLE SLOPE MAP** most of the obvious landslide indicators for your review. Some of these landslide features may be quite deep, while others may be relatively shallow, depending on the area.

I also interviewed Mr. Bruce Brown, your neighbor to the west, who has lived on the property for approximately 20 years. He indicated to me that the hillsides located directly adjacent, and to the east of his house have experienced numerous landslide and mudflows in past years, typically associated with heavy rainfall events (oral communication, March 8, 2006). His observations and local experiences are consistent with the presence of deep seated landslide activity associated with the presence of highly weathered Rincon Formation bedrock located on moderate to steep slopes.

## **3. GEOLOGIC CONDITIONS**

### **3.1. *Local Stratigraphy***

The subject property is dominated by moderate to steep slopes that are commonly covered with annual grasses and other forms of soft chaparral species. The clay soils are typically highly expansive, subject to "creep", and otherwise problematic in terms of site preparation work. Careful attention is therefore required in the design and construction process for any man-made feature (i.e. driveway corridor, house site, fencing, etc.). The extreme southern portions of the property are underlain by a relatively thin veneer (less than approximately 20 to 30 feet) of *Older Alluvium* (shown as "Qoa" on Figure 1). These earth materials are composed of interbedded sandy to gritty conglomerate and sandy clay and are considered generally suitable for residential construction when properly prepared. The southern two-

thirds of the Building Envelope are underlain by Older Alluvium materials. The parent bedrock in the area is composed of shale and mudstone called the *Rincon Formation* (shown as "Tr" on Figure 1). This formation is notorious for forming thick clay rich soils that are prone to deep seated "creep" and landslide deposits on sloping terrain. The focus of this investigation was to identify and map the local landslide deposits in relationship to potential building areas located elsewhere on the property (as opposed to the previously designated and intensively studied Building Envelope).

### **3.2. Landslides and Slope Stability**

My recent detailed geologic mapping and field reconnaissance inspection of the subject property showed the presence of several small to moderate scale landslide deposits on the property. The *Landslide deposits* are composed of highly expansive clay soil and weathered mudstone bedrock that has failed due to oversaturation and structural failure. The landslide deposits have several different forms of failure on this property including shallow and deep seated rotational failure, mudflows, and debris flows. The mudflows can become quite "liquid" in their failure mode, acting like a viscous fluid with a very low angle of repose. Failure can occur on slopes as gentle as 4:1 (horizontal to vertical; approximately 14°). The fluid like mass can "run out" onto essentially flat lying terrain for many tens of feet. Residential construction at the base of these slopes is therefore not recommended.

I have graphically shown the approximate extent of the landslide and deep seated soil creep prone areas on the Figure 2. It is noteworthy that nearly the entire driveway road corridor leading from the Main Gate northward toward Mr. Brown's house (and the alternative residential building area suggested by some members of the public) is underlain by landslide deposits. Residential building along the existing driveway corridor is therefore not recommended.

## **4. CONCLUSIONS**

### **4.1. Summary**

I have surveyed several potential alternative building areas elsewhere on the property with the intent of finding areas that are geologically suitable for construction *and* are positioned so as to reduce the impact on the view shed from Highway 101 and elsewhere along the coastline. I specifically assessed the area near the northwestern corner of the property from the front gate, northward along the dirt access road, all the way to the extreme northern corner of the site near the Simon Water Well #1. It is my opinion that nearly the entire road corridor is underlain by a thick accumulation of clay rich soils that are subject to creep and/or landslide. The upper portions of the road corridor, adjacent to the Simon Well and the Brown residence are underlain by active landslide deposits that are prone to future failure.

It is my opinion that attempting to stabilize this narrow "relatively" gentle sloping area and protecting it from future impact by landslide or mudflows is not technically feasible without extreme engineering efforts including massive grading of the entire hillside. Such a grading project would involve the removal of many hundreds of thousands or even one million cubic yards (or more) of earth. The materials would


**SLOPE STABILITY INVESTIGATION REPORT: Simon Property**  
**March 11, 2006**

have to be stored or removed from the site, benches made, and then replaced and recompact. This means that all mass grading calculations would require double handling of the materials. Such a grading operation would cost well in excess of several millions of dollars. It is noteworthy that Santa Barbara County has historically not allowed such a mass grading project to occur, especially on a single family residential project of this size and scope.

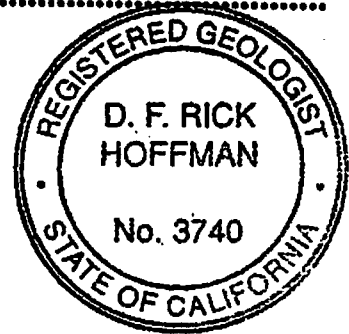
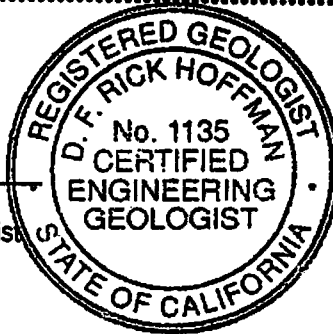
I also inspected several possible residential building areas within the eastern portions of the property. These areas can be accessed only by a driveway corridor passing from the existing gate eastward along the old Highway corridor. The approach crosses several large areas of landslide deposits, as well as wetland areas. House sites in the eastern portions of the subject property would have to be cut out of relatively steep terrain. As a result, development of a residential building site and driveway access along this corridor would involve mass grading and impact wetland habitat in order to be considered.

Based on my 30 plus years of local geologic and slope stability experience in Santa Barbara County, it is my opinion that the existing Building Envelope as shown on Figure 1 and Figure 2 is the only geologically suitable residential site on the subject property. There are no suitable alternative sites located on this parcel that afford a reasonable level of geologic hazard security for residential habitation. Because of the potential for the new residence being viewed by highway traffic along the Highway 101 corridor, you can consider the placement of vegetative screening along the outer (southern) edge of the building pad. As exposed within my Geologic Inspection Trenches excavated along the southern edge of the Building Envelope, there is a moderately thick section of *Older Alluvium* in this area. This material is composed of pebble and sandy conglomerate and gritty sand. I have graphically shown the estimated aerial extent of the Older Alluvium on Figure 2. These earth materials should be permeable enough and contain sufficient sandy material to support the growth of several hard chaparral species such as Oak and Sycamore trees.

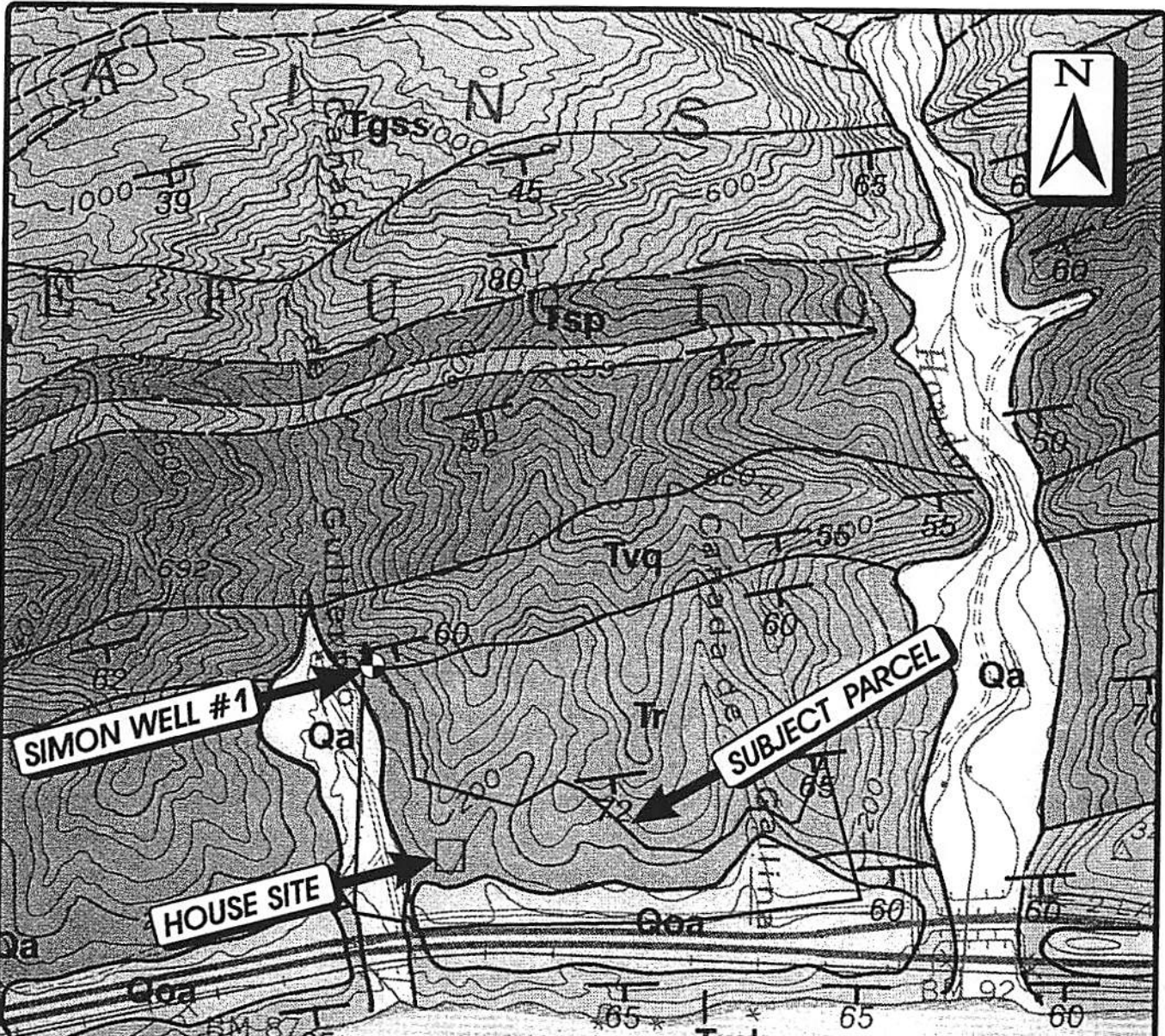
Sincerely,



Mr. D.F. Rick Hoffman  
Certified Engineering Geologist & Hydrogeologist  
State of California  
RG #3740 EG #1135 HG #448



enclosures



**GEOLOGIC MAP REPRODUCED FROM: Dibblee, 1988**

**LEGEND**

- Qa Alluvium
- Qoa Older Alluvium
- Tm(l) Monterey Formation: (l) lower member
- Tr Rincon Formation
- Tvq Vaqueros Formation
- Tsp Sespe Formation
- Ta Alegria Formation
- Formational contact: dashed where approximate
- ↘ 72° Strike & dip of bedding
- ▭ Subject parcel: approximate boundary
- ⊙ Simon Well #1 Location (approximate)
- House Site (see Figure 2 & discussion in text)



**LOCAL GEOLOGIC MAP**  
 RESIDENTIAL SITE DEVELOPMENT PROJECT  
 Dick & Anne Marie Simon Property  
 15000 Calle Real, Gaviota, California

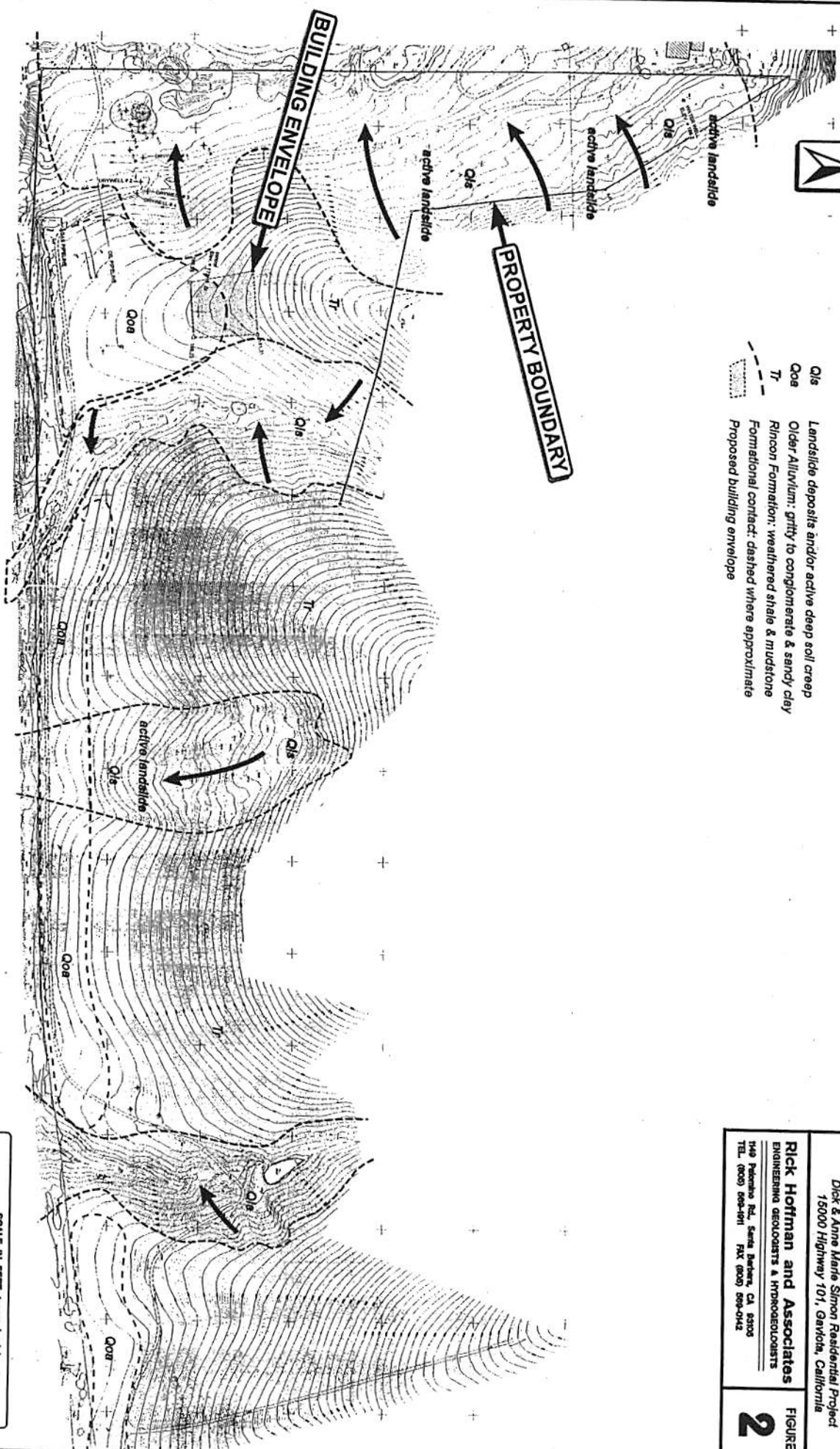
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**Rick Hoffman and Associates**  
 ENGINEERING GEOLOGISTS & HYDROLOGISTS

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**FIGURE 1**





**LEGEND**

- Qls Landslide deposits and/or active deep soil creep
- Qoe Older Alluvium: gritty to conglomerate & sandy clay
- T Rincon Formation: weathered shale & mudstone
- Formation contact: dashed where approximate
- Proposed building envelope

**UNSTABLE SLOPE MAP**

PRELIMINARY GEOLOGIC INVESTIGATION  
 Dick & Anne Marie Simon Residential Project  
 15000 Highway 101, Gavota, California

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FIGURE  
**2**

