PRELIMINARY GEOTECHNICAL ASSESSMENT FOR A REVISION OF THE GEOLOGY AND SOILS SECTION OF THE DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE WEST LOS ANGELES COLLEGE FACILITIES MASTER PLAN, CULVER CITY, CALIFORNIA

Prepared for:

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July 13, 2004

Project No. 600501-001

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To: Myra L. Frank, Jones & Stokes
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Attention: Mr. Lee Lisecki

Subject: Preliminary Geotechnical Assessment for a Revision of the Geology and Soils Section of the Draft Environmental Impact Report for the West Los Angeles College Facilities Master Plan, Culver City, California

At you request and authorization, Leighton Consulting, Inc. is pleased to present the results of our preliminary geotechnical assessment as an addendum for the existing geology section for the Draft Environmental Impact Report (DEIR) for the West Los Angeles College (WLAC) Facilities Master Plan. The purpose of this study is to assist the Envicom Corporation in preparation of the revision to the Geology and Soils Sections of the DEIR for the project. The revision to the West Los Angeles College Facilities Master Plan includes a proposed new access road near the northwest corner of the campus connecting the campus and Jefferson Boulevard, as shown in your faxed aerial photograph dated April 2, 2004. The college also wants to consider an alternate road alignment connecting the campus to La Cienega Boulevard, and referred to as Option C shown in Figure III-6 of the original DEIR, dated July 23, 2003. The geotechnical assessment included the study of:

- Earth units onsite and their engineering characteristics;
- Geologic structure;
- Faults and seismicity;
- Secondary seismic hazards;
- Existing landslides;
- Slope stability;

- Groundwater conditions;
- Subsidence;
- Mineral resources; and
- Volcanic hazard.

This report summarizes our findings and conclusions, then presents possible mitigation measures for the potentially adverse impacts identified. Our review has incorporated published geologic information, and our in-house data from recent subsurface investigations on the project site.

The most significant potential hazards that could affect the proposed access road alignments are fault-induced ground rupture, ground deformation hazards associated with strong seismic shaking, shallow groundwater, and compressible soils. Slope stability hazards primarily associated with erosion are present throughout the site, particularly along the proposed access road alternative connecting the campus to La Cienega Boulevard. Site-specific investigations will be necessary for these areas and, during grading of the site, these hazards may require additional remedial grading for specific mitigation. Settlement and differential settlement are also potential impacts due to the variation in compressibility of the earth units found in the Baldwin Hills. Potentially shallow groundwater near the proposed access road alternative connecting the campus to Jefferson Boulevard contributes to the potential for liquefaction at the site as well as possibly impacting deeper excavations that may be required during grading operations.

The proposed access road alternative connecting the campus with La Cienega Boulevard traverses the southern margin of a designated Alquist-Priolo Earthquake Fault Zone. The zone is designated in this area because of an earthcrack due to creep or potential creep as a result of the Baldwin Hills subsidence field (Castle and Yerkes, 1976). The access road is not a structure intended for human occupancy, therefore, no special precautions or restrictions (such as building setbacks or mandatory trenching of possible fault traces) are required.

The site is located less than 2 miles from the Newport-Inglewood Fault Zone, as well as within 62 miles of numerous other active fault systems. A moderate to large earthquake occurring along the Newport-Inglewood fault, in addition to any of the other major Los Angeles basin faults, could result in strong seismic shaking at the site. To minimize structural damage during an earthquake, the proposed project site should be investigated, designed and constructed in accordance with all State of California guidelines, current grading and building codes, and any local regulations.

During the course of this study, we have not identified any geologic or geotechnical condition that would preclude development of the proposed access road alignment alternatives. However, further, site-specific investigations and analyses may reveal the need for remedial grading or design constraints (such as building setbacks). Numerous options, presented herein, are available for mitigation of the potentially significant impacts. The details of these mitigation measures should be studied and refined during future detailed geotechnical analyses.

We appreciate the opportunity to provide our services for this interesting project. If you have any questions, please contact this office at your convenience.

Respectfully submitted,

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1.0 INTRODUCTION

1.1 Purpose and Scope of Work

The purpose of this study is to provide a preliminary assessment of the potential geologic, soil engineering, groundwater, and seismic impacts which may affect the design and construction of the proposed access roads for West Los Angeles College (WLAC) in Culver City. The information provided herein is intended for use as part of the Draft Environmental Impact Report for the project. We have identified several potentially significant impacts to the development, and, where applicable, provided possible remedial measures.

1.2 Methodology

This study was conducted in accordance with the guidelines set forth by the California Geological Survey (formerly know as the California Division of Mines and Geology) in Notes 46 and 52, for preparation of Environmental Impact Reports (California Division of Mines and Geology, 1982 and 2001). The preliminary geotechnical assessment was conducted as follows:

- Review of available published documents and unpublished reports covering geotechnical conditions at the site and in the vicinity. This literature search also included a review and analysis of historical aerial photographs from numerous flights between 1938 to 1989. The references and aerial photographs reviewed are listed at the end of this report in Appendix A.

- Review of data collected during previous geotechnical investigations at the adjacent site (WLAC) by Leighton. These investigations included the excavation of a total of 35 borings, and various laboratory tests. These investigations included site specific geotechnical and geologic hazard evaluations for various sites within the WLAC campus (Leighton, 1999, 2003a, 2003b, 2004a, 2004b, and 2004c).

- A deterministic seismic hazard analysis for the major active and potentially active faults in the region was performed. The analysis is a site-specific evaluation of the potential ground motion expected for the site which would be caused by the maximum earthquake expected to occur along any fault within a 100 km (about 62.5

mile) radius of the site. The seismic hazard analysis calculates the peak horizontal ground acceleration (PGA) to be expected at the site, based on the shortest distance to the fault, the maximum expected earthquake magnitude, and the attenuation of the seismic energy between the earthquake focus and the site. In the case of shallowly dipping faults the distance could be shorter beneath the site rather than the distance to the surface break. An average of the attenuation relationship of Abrahamson and Silva (1997), Sadigh et al. (1997) and Campbell (1997 and 2000) were used in this analysis.

- The discussion of geologic, seismic, groundwater, and soil engineering aspects of this report is based on the data obtained from the above mentioned sources. Each aspect was evaluated, and where appropriate, potential mitigation measures were provided.

1.3 Proposed Development

The proposed development included in the revision to the DEIR for the WLAC Facilities Master Plan is two potential access road alternatives. The proposed access road alternatives are located near the northern portion of the campus, connecting the campus and Jefferson Boulevard and La Cienega Boulevard, respectively (Figure 1). There were no grading plans available at the time of this report; however, the use of typical grading techniques are expected, i.e. cutting the hills and filling the lower elevations for construction of the access roads.

1.4 Site Location and Description

West Los Angeles College is located east of Ballona Creek at the western margin of the Baldwin Hills in Culver City. The campus overlooks the Cheviot Hills and the Ballona Gap to the northwest, which are drained by Ballona Creek. Our study evaluated two proposed access roads for West Los Angeles College. The first proposed access road is located near the northwest corner of the campus, connecting the campus and Jefferson Boulevard, as shown in your faxed aerial photograph dated April 2, 2004 and also shown on Figure 1. The college also wants to consider an alternate road alignment referred to as Option C, as shown in Figure III-6 of the original DEIR, dated July 23, 2003 and also shown on Figure 1. This alternate road alignment traverses a portion of the Baldwin Hills, connecting the campus and La Cienega Boulevard.

The Baldwin Hills consist of a dome-like prominence, with steeper northern, and gentler southern slopes (Hsu et al., 1982). Currently the site for the two proposed access roads is undeveloped and being used for oil production (Inglewood Oil Field). The topography at WLAC slopes gently towards the west, and ranges in elevation from approximately 90 to 200 feet above sea level. The elevation of the area that contains the alignment for the proposed access road connecting the campus to Jefferson Boulevard ranges from approximately 80 to 140 feet above sea level. The elevation of the area that contains the alignment for the proposed access road connecting the campus to La Cienega Boulevard (referred to as Option C shown on Figure III-6 of the original DEIR, dated July 23, 2003) ranges from approximately 150 to 400 feet above sea level.

2.0 GEOTECHNICAL CONDITIONS

2.1 Regional Geologic Setting

The site is located within the Los Angeles Basin, a geologically complex region of southern California near the intersection the Peninsular Ranges geomorphic province and the Transverse Ranges geomorphic province. The Peninsular Ranges province is characterized by a series of northwest to southeast-oriented valleys, hills and mountains separated by faults associated with, and subparallel to, the San Andreas Fault system. One of these faults, the Newport-Inglewood fault, is located in the vicinity of the site. The Transverse Ranges are characterized by east-west trending folds and faults (Davis et al., 1989; Wright, 1991). Regional faulting in the Transverse Ranges has been characterized by right-lateral strike-slip faults that are high angle to vertical, or fold associated thrust faults. The boundary between the Transverse Ranges and the Peninsular Ranges province are involved in a complex process of folding and faulting associated with the collision between the Pacific and North American tectonic plates.

The bedrock units exposed in the Baldwin Hills area are sediments deposited in a shallow marine basin at the margin of the Los Angeles structural basin. Deposition of these rock units began about two million years ago, and continued until about 100,000 years ago.

2.2 Local Geology

WLAC is located immediately west of the Baldwin Hills and southeast of Ballona Creek, the ancestral trace of the Los Angeles River. The Baldwin Hills have been uplifted by movement along the active Newport-Inglewood Fault Zone, and are the largest and most prominent of the group of hills along this fault zone (Hsu et al., 1982).

The site of the first proposed access road connecting the campus to Jefferson Boulevard is located east of Ballona Creek and immediately west of the Baldwin Hills. The second proposed access road, Option C, traverses a portion of the Baldwin Hills connecting the campus to La Cienega Boulevard. The north-northwest trending Newport-Inglewood Fault Zone is present east of WLAC and approximately 1,000 feet east of the eastern terminus of the proposed Option C alternative near La Cienega Boulevard.

Based on our review of available maps, published documents, and aerial photographs the site for the proposed access road alternatives traverses the Inglewood Oil Field, which has been in production since September 1924.

The Baldwin Hills that make up the project site and the area adjacent to the project site are made up of a succession of Pleistocene-age (two million to 10,000 years old) sedimentary rocks assigned primarily to the Culver Sand and the Inglewood Formation. Hsu et al. (1982) describes the younger Culver Sand, as being at least partially equivalent to the San Pedro Formation.

Debris aprons or alluvial fans have developed at the base of these hills and deposits of colluvium have accumulated in drainage swales and at the toes of natural slopes. The adjacent Ballona Gap to the west is underlain by alluvial and flood plain sediments eroded from the nearby hills and deposited by the ancestral Los Angeles River. The proposed access road alternatives are underlain by artificial fill, alluvium, colluvium, and the Pleistocene-aged Culver Sand (Hsu, et al., 1982).

2.3 Local Geologic Units

The two proposed access road alternatives are underlain by of the Inglewood Formation, the Culver Sand, the Baldwin Hills Sandy Gravel, Alluvium and Colluvium, and Artificial Fill. The areal extent of the geologic units are shown on Figure 2 and discussed in more detail below.

2.3.1 Inglewood Formation (Map Symbol: Qi)

The oldest surficial bedrock unit exposed in the vicinity of the two proposed access road alternatives is the early Pleistocene-age (2 to 1 million years ago) Inglewood Formation. The Inglewood Formation consists primarily of thinly interbedded siltstone and very fine-grained sandstone deposited in a shallow marine environment. This rock unit is locally clay-rich and commonly contains calcareous and limonitic concretions. The siltstone and sandstone beds of this formation are well-consolidated and typically light-brown to gray-brown. This rock unit is generally dense and moderately expansive when weathered (Hsu, et al., 1982). Neither of the proposed access road alternatives directly traverses the Inglewood Formation, however it is found in the vicinity of the project area and unconformably underlies the slightly younger Culver Sand (Figure 2).

2.3.2 Culver Sand (Map Symbol: Qc)

The Late Pleistocene-age (1 million to 100,000 years ago) Culver Sand is exposed at the surface throughout a major portion of the access road alternative that connects the campus with La Cienega Boulevard (Figure 2). The Culver Sand consists primarily of fine to coarse-grained sand interbedded with lenses and thin beds of gravel deposited in a near-shore marine environment. This unit sits unconformably on top of the Inglewood Formation, and is crudely stratified to laminated. The sand and gravel facies grades from the northeast to the southwest into a more cemented, well-laminated fine to medium grained sand with scattered small pebbles. A high to very high erosion susceptibility is also common to the Culver Sand (Hsu, et al., 1982).

2.3.3 Baldwin Hills Sandy Gravel (Map Symbol: Qb)

The Late Pleistocene-age (100,000 to 10,000 years ago) Baldwin Hills Sandy Gravel is exposed in the vicinity of the two proposed access road alternatives (Figure 2). The Baldwin Hills Sandy Gravel consists of non-marine fluvial sediments deposited by the ancestral Los Angeles River and its tributaries, and lies above the Culver Sand in both erosional and transitional contact. In the vicinity of the project area, this unit consists of primarily brownish clayey silt with interbeds of angular-grained, sandy gravel and massive to laminated sand. There are also clay beds about 4 inches thick that occur at the base of the unit in this area, making it moderately to highly susceptible to surficial landslides or debris flows (Hsu, et al., 1982).

2.3.4 Alluvium and Colluvium (Map Symbol: Qco)

The more youthful Holocene-age (10,000 years to present) alluvial and colluvial deposits are present in the canyons and the surrounding lowlands around the Baldwin Hills area. This undivided unit varies in composition, but primarily consists of sand intermixed with clay, silt, and gravel. It is generally poorly sorted and unconsolidated, and is slightly more indurated in the areas having low topographic relief (Hsu, et al., 1982). Alluvium is present along the entire proposed access road alternative that connects the campus to Jefferson Boulevard (Figure 2). Colluvium is also present in the canyons along portions of the other proposed access road alternative connecting the campus to La Cienega Boulevard (Figure 2).

2.3.5 Artificial Fill (Map Symbol: Af)

Artificial fill is present throughout the Baldwin Hills area, and is present near the eastern terminus of the proposed access road alternative that connects the campus to La Cienega Boulevard (Figure 2). These fill materials are generated by human activities generally associated with the road construction and residential development in the area.

2.4 Local Geologic Structure

Regional tectonic activity has uplifted the Baldwin Hills area, resulting in tilting, folding, and faulting of the sedimentary layers in the underlying bedrock. The uplift and faulting of the Baldwin Hills is related to the northwest- to southeast-trending Newport-Inglewood Fault Zone, extending onshore from Newport Mesa in the south to the Cheviot Hills in the north (Barrows, 1974). This system of northwest trending hills also includes the Dominguez Hills, Signal Hill, Bolsa Chica Mesa, and Huntington Beach Mesa. The largest and most destructive of the many earthquakes that have occurred along this fault zone during historic time was the Long Beach earthquake of March 10, 1933, which produced a 6.3 magnitude shock resulting in 120 deaths and more than $40 million in damage (Barrows, 1974).

2.5 Regional Faulting and Seismicity

Southern California is a geologically complex area that includes several types of faults with movement along the faults that are lateral, vertical, or a combination of both (Figure 3). Any specific area is subject to seismic hazards of varying degree, depending on the proximity and earthquake potential of nearby active faults, and to the local geologic and topographic conditions, which can either amplify or attenuate the seismic waves. Seismic hazards include primary hazards from surface rupturing of rock and soil materials along active fault traces, and secondary hazards resulting from strong ground shaking.

2.5.1 Surface Rupture

To protect structures for human occupancy from the hazard of surface ground rupture along a fault line, the CGS, under the State-mandated Alquist-Priolo Act of 1972, has delineated "Earthquake Fault Zones" along active or potentially active faults (Hart and Bryant, 1999). A fault is considered active if there is evidence of movement along one or more of its segments in the last 11,000 years, that is either directly observable or inferred. A well-defined fault is one in which "its trace can be clearly detectable by a trained geologist as a physical feature at or just below the ground surface." A well-defined fault may be identified by either direct or indirect methods. If a site is located within an Earthquake Fault Zone, a detailed fault investigation is required prior to construction. The proposed access road alternative that connects the campus to La Cienega Boulevard crosses the southern margin of an area delineated as an earthquake fault zone on the State of California Special Studies Zones Map for the Beverly Hills 7.5-Minute Quadrangle (CDMG, 1986a), as shown on Figure 4. This alternative also crosses four fault traces shown on Figure 2 and mapped by Hsu et al. (1982), however they are not identified on the State of California Special Studies Zones Map for the Beverly Hills and Hollywood 7.5-Minute Quadrangles (CDMG, 1986a and 1986b).

The Alquist-Priolo Act was passed in 1972 in response to the damage to homes caused by ground rupture during the 1971 San Fernando Earthquake. The act applies to structures for human occupancy and requires the State Geologist to designate faults that should be subject to additional studies before siting structures. The additional studies generally define a zone between the fault and the habitable structure. Since the time the act was passed, a new class of faults has been recognized. These are the blind thrust faults. The blind thrust faults are active faults that have not yet broken through the ground surface. Therefore, no setback zone or zones requiring additional study have been defined for these faults.

2.5.2 Seismic Shaking

The probability that the site will be subject to strong seismic shaking from a moderate to large earthquake on a major active fault in the Los Angeles region is high. The intensity of ground shaking at a given location depends primarily upon the earthquake magnitude, faulting mechanism, distance from the source (epicenter), and the site response characteristics (Petersen et al., 1998). The intensity of shaking is generally amplified in areas underlain by deep deposits of loose, unconsolidated soils. Ground shaking is also known to be enhanced by topographic highs, but this phenomena is poorly understood at this time. The most common effects of strong seismic shaking include liquefaction and its related ground deformations, dynamic settlement, and landsliding.

2.5.3 Nearby Active Faults

Numerous faults have been mapped within the southern California region, several of which are within about 62 miles (100 kilometers) of the site (the CGS requires that those faults within 100 kilometers that could effect the site or the proposed project be identified). The major active and potentially active fault systems that could produce significant ground shaking at the site include the Newport-Inglewood, Santa Monica, Hollywood, Puente Hills blind-thrust, Upper Elysian Park blind-thrust, Malibu Coast, and the Palos Verdes fault. The locations and distance of these faults with respect to the site are shown on the Regional Fault Map (Figure 2), along with the approximate locations of the epicenters of some major historical earthquake events. Characteristics of a select few of these individual fault systems are discussed below, and a listing of all within 100 kilometers is provided in Appendix B. An estimation of the ground motion expected at the site is also presented in Appendix B.

Newport-Inglewood Fault Zone

The Newport-Inglewood Fault Zone is a broad zone of discontinuous faults and folds striking southeastward from near Santa Monica across the Los Angeles basin to Newport Beach and comes as close as 1.2 miles to the proposed access road alignments (Abrahamson and Silva, 1997). In the northwest portions of the fault zone, the Newport-Inglewood is on trend with the Cheviot Hills and West Beverly Hills Lineament, the latter marking the left step-over between the presumably left-lateral Santa Monica and Hollywood faults (Dolan et al., 1997, 2000b). Faults having similar trends and projections occur offshore from San Clemente and in San Diego (the Rose Canyon and La Nacion faults). Altogether these various faults constitute a system more than 240 kilometers long that extend into Baja California, Mexico. The proximity of this active fault to the site, and its potential for generating large earthquakes, makes the Newport-Inglewood fault a significant seismic hazard to the subject site. This fault is thought to be capable of producing a maximum moment magnitude (M_w) of 7.1 (Petersen et al., 1996). Such an event would generate peak horizontal ground accelerations about 0.75g along the proposed access road alignment connecting the campus to La Cienega Boulevard, and 0.52g along the proposed access road alignment connecting the campus to Jefferson Boulevard (see Appendix B).

Santa Monica Fault

The Santa Monica Fault is a part of the Transverse Ranges Southern Boundary fault system, a west-trending system of reverse faults that extend for more than 125 miles along the southern edge of the Transverse Ranges (Dolan et al., 2000a). This fault comes to within 4.8 miles of the proposed access road alignments. It extends east from the coastline in Pacific Palisades through Santa Monica and West Los Angeles and merges with the Hollywood fault at the West Beverly Hills Lineament in Beverly Hills. It is considered active with evidence of recent movement along the fault with the potential of generating an earthquake with a maximum moment magnitude (M_w) of 6.6 (Petersen et al., 1996). Such an event would generate peak horizontal ground accelerations about 0.51g along the proposed access road alignment connecting the campus to La Cienega Boulevard, and 0.45g along the proposed access road alignment connecting the campus to Jefferson Boulevard (see Appendix B).

Hollywood Fault

The Hollywood fault extends east-northeast for a distance of 17 kilometers through Beverly Hills, West Hollywood, and Hollywood to the Los Angeles River. It is truncated on the west by the north-northwest striking West Beverly Hills Lineament, which marks a left step of ¾ mile between the Santa Monica fault and the Hollywood fault (Dolan et al., 2000a). The Hollywood fault comes to within 5.0 miles of the proposed access road alignments. This fault is considered active, and is thought to be capable of generating an earthquake with a maximum moment magnitude (M_w) of 7.1 (Petersen et al., 1996). Such an event would generate peak horizontal ground accelerations about 0.47g along the proposed access road alignment connecting the campus to La Cienega Boulevard, and 0.45g along the proposed access road alignment connecting the campus to Jefferson Boulevard (see Appendix B).

Puente Hills Blind-Thrust Fault

Movement on the Puente Hills Blind-Thrust Fault (PHT) caused the 1987 M 6.0 Whittier Narrows earthquake. The hypocenter of the 1987 event was at depth of approximately 8 miles below the San Gabriel Valley near Whittier Narrows. This fault does not reach the surface but instead a fold is formed above the fault and is seen as a fold at or just below the surface (Shaw and Shearer, 1999; Dolan et al., 2003). To the north of the 1987 hypocenter, the fault flattens and continues beneath the San Gabriel mountains and merges with the Sierra Madre-Cucamonga fault system (Fuis et al, 2001). The proposed access road alignments lie above and to the west of the western continuation of this fault, although it is not known exactly at what depth below the project site the fault exists. This fault is thought to be capable of producing a maximum moment magnitude (M_w) of 7.1 (Petersen et al., 1996). Such an event would generate peak horizontal ground accelerations about 0.49g along the proposed access road alignment connecting the campus to La Cienega Boulevard, and 0.46g along the proposed access road alignment connecting the campus to Jefferson Boulevard (see Appendix B).

Upper Elysian Park Blind-Thrust Fault

The Upper Elysian Park Blind Thrust fault does not reach the surface, but instead rocks have been deformed above the fault to form a 12.5 mile long anticline referred to as the Elysian Park Anticlinorium (Dolan et al., 2001). This anticlinorium is located northeast of the site and the fault comes to within approximately 8.6 miles of the proposed access road alignments. This fault is considered active, and is thought to be capable of generating an earthquake with a maximum moment magnitude (M_w) of 6.4 (Petersen et al., 1996). Such an event would generate peak horizontal ground accelerations about 0.30g along the proposed access road alignment connecting the campus to La Cienega Boulevard, and 0.28g along the proposed access road alignment connecting the campus to Jefferson Boulevard (see Appendix B).

Malibu Coast Fault

The Malibu Coast fault extends east-west for a distance of approximately 23 miles along the coast and the Santa Monica Mountains near Malibu. The Malibu Coast fault comes to within 8.6 miles west of the proposed access road alignments, and is the western extension of the Santa Monica Fault. This fault is considered active, and is thought to be capable of generating an earthquake with a maximum moment magnitude (M_w) of 6.7 (Petersen et al., 1996). Such an event would generate peak horizontal ground accelerations about 0.32g along the proposed access road alignment connecting the campus to La Cienega Boulevard, and 0.33g along the proposed access road alignment connecting the campus to Jefferson Boulevard (see Appendix B).

Palos Verdes Fault

The Palos Verdes fault extends north-northwest for a distance of 60 miles, following the front of the Palos Verdes Hills between Redondo Beach and San Pedro. This fault also extends across Los Angeles Harbor onto the continental shelf to the southeast (Dolan et al., 2001). The Palos Verdes fault comes to within 8.8 miles of the proposed access road alignments. This fault is considered active, and is thought to be capable of generating an earthquake with a maximum moment magnitude (M_w) of 7.3 (Petersen et al., 1996). Such an event would generate peak horizontal ground accelerations about 0.32g along the proposed access road alignment connecting the campus to La Cienega Boulevard, and 0.33g along the proposed access road alignment connecting the campus to Jefferson Boulevard (see Appendix B).

2.6 Local Faulting

No active faults are known to directly cross either of the proposed access road alignments, however, the proposed alignment connecting the campus to La Cienega Boulevard crosses the margin of an Alquist-Priolo Earthquake Fault Zone. This alignment also crosses four other minor, localized faults that are shown on Figure 2 (Hsu et al., 1982).

2.7 Subsidence

In California, subsidence has resulted from withdrawal of subsurface fluids such as oil and groundwater, oxidation of subsurface organic material such as peat and coal, and by hydroconsolidation (from excessive irrigation) of loose, dry soils in a semi-arid climate.

Petroleum has been withdrawn from the project area since the first discovery well was completed in the Inglewood Oil Field on September 28, 1924. As a result, the recent surface movements in the Baldwin Hills area are attributed largely or entirely to the exploitation of the Inglewood Oil Field (Castle and Yerkes, 1976). Consequently, some future subsidence resulting from petroleum withdrawal may be anticipated.

2.8 Volcanic Hazards

Hazards from nearby volcanic activity include lava flows and ash falls. Amboy Crater is the closest potentially active volcano to the project site. It is located about 125 miles to the northeast of Culver City. It is a complex of vents and a cinder cone volcano, with the last eruption about 6000 years ago. It has, however, erupted many times in the past 10,000 years (Parker, 1963; Miller, 1989). The project site is not within the potential hazard area of the Amboy Crater volcanic area (Miller, 1989).

2.9 Existing Slope Stability

Three minor landslides and suspected landslides have been mapped within the vicinity of the project site; however, neither of the proposed access road alignments traverse a delineated landslide (Figure 2). Slope stability has not been a major hazard in vicinity of the proposed access road alignments because the bedrock units in the area are poorly bedded, sandy, and generally strong. The area is relatively sparsely developed with oil wells, roads for access to the wells, and other oil field activities (Hsu et al., 1982).

2.10 Groundwater

Borings drilled at WLAC by Leighton (1999, 2003a, 2003b, 2004a, 2004b, and 2004c) indicate that groundwater was not encountered within approximately 80 feet beneath WLAC at the time of the investigations. The Los Angeles County Flood Control District Coastal Plain Well Location and Shallow Aquifers Map for 1978 indicated groundwater west of WLAC was at an elevation of 10 feet below MSL (in other words, approximately 160 feet beneath the onsite existing ground surface). Based on the reports from the California Geological Survey (De Lisle, 1998; Mattison and Loyd, 1998), the historically shallowest groundwater depth along the two proposed access road alignments is located near the western terminus of the road connecting the campus to Jefferson Boulevard. The historically shallowest groundwater in this area was approximately 20 feet below ground surface (De Lisle, 1998). Shallow groundwater is not expected in the Baldwin Hills area where bedrock is exposed at the surface.

2.11 Soil Engineering Characteristics

2.11.1 Compressible Soils

The undisturbed bedrock in the project area has very low compressibility characteristics, and should adequately support any proposed fill and or/or building loads. Conversely, topsoil, alluvium, colluvium, landslide debris, slopewash, and uncompacted fills are moderately to highly compressible. All of these materials, except for the uncompacted fills, are more compressible in the upper 5 to 10 feet below the natural ground surface, typically becoming increasingly more compact with depth. Uncompacted fills are not suitable for support of fills or structures, and can often contain trash and debris. They should generally be removed down to competent native soils.

2.11.2 Expansive Soils

Based on preliminary laboratory testing on samples from previously-drilled borings within the adjacent project site at the WLAC campus, the expansion index within the alluvium is considered low (Leighton, 1999, 2003a, 2003b, 2004a, 2004b, and 2004c). The Inglewood Formation bedrock that consists predominantly of silt to very fine-grained sand is usually within the medium expansion range (Hsu et al., 1982). The sandstone layers of Culver Sand should not be expansive. Colluvium, being partially a product of weathering, is typically clayey and in the low to moderate expansion range (Hsu et al., 1982).

2.11.3 Corrosive Soils

Corrosive soils contain chemical constituents that may cause damage to construction materials such as concrete and ferrous metals. One such constituent is water-soluble sulfate, which, if high enough in concentration, can react with and damage concrete. Preliminary laboratory tests from projects at the adjacent WLAC campus performed by Leighton (1999, 2003a, 2003b, 2004a, 2004b, and

2004c) indicate the soils are below the minimum sulfate concentration considered by the Uniform Building Code (ICBO, 1997) to be potentially damaging.

Electrical resistivity, chloride content and pH level are indicators of the soil's tendency to corrode ferrous metals. Initial laboratory tests results on samples from the adjacent project site at WLAC (Leighton, 1999, 2003a, 2003b, 2004a, 2004b, and 2004c) indicate that the soils in the region are at least moderately to severely corrosive to ferrous metals.

2.11.4 Rippability and Oversize Rock

Bedrock of the Culver Sand and Inglewood Formation is generally easy to rip with modern earthmoving equipment. Oversize rock is not anticipated in the areas of the proposed access road alternatives. Oversize rock is defined as rock fragments over about 8 inches in diameter.

2.11.5 Suitability as Fill Material

The bedrock and surficial soils overlying the bedrock should be suitable for fill provided organics and any deleterious materials are removed. Moisture may be need to be added to the near surface soils, which tend to be drier than the optimum moisture content needed for compaction. Conversely, deeper alluvial soils (but within the upper 10 feet) are frequently wetter than optimum, and therefore, may need to be dried out or mixed with drier materials in order to achieve compaction.

2.11.6 Erosion

The erosion characteristics of the bedrock and surficial soils in the project area vary considerably. Erosion is most prevalent in unconsolidated deposits such as alluvium and colluvium, which are prone to rills, sheet wash, slumping and bank failures during and after heavy rainstorms. The Culver Sand is also has a high susceptibility to erosion. Fill slopes constructed with onsite soils will most likely be moderately susceptible to erosion.

2.11.7 Mineral Resources (Petroleum)

Petroleum exploration and production is ongoing in the Baldwin Hills. The Inglewood oil field is located in the immediate vicinity of the proposed access road alignments, and oil production has existed since September 28, 1924 when the first discovery well was completed (Driver, 1943). Exploitation and production are expected to continue in the future.

3.0 SUMMARY OF POTENTIAL GEOTECHNICAL IMPACTS AND MITIGATION MEASURES

This section summarizes the principal geotechnical conditions that occur in the study area. The potential impact that each condition may have on the site is subjectively rated as less-than-significant or potentially significant. The California Geologic Survey has prepared guidelines for geologic and seismic considerations in environmental impact reports in order to identify potential geologic hazards and assist in recognizing data needed for design analysis and mitigation measures. Their guidelines have been used in this report.

3.1 Seismic Hazards

3.1.1 Fault-Induced Ground Rupture

No designated Alquist-Priolo Earthquake Fault Zones cross the proposed access road alignment connecting the campus to Jefferson Boulevard. However, the proposed access road alignment connecting the campus to La Cienega Boulevard does cross the southern margin of an Alquist-Priolo Earthquake Fault Zone (Figure 4). This designated Earthquake Fault Zone surrounds a ground crack that has had some vertical movement documented (Castle and Yerkes, 1976). Although the alignment does not cross the ground crack it does cross the zone surrounding the crack. Castle and Yerkes (1976) attribute the cracking to subsidence resulting from oil-field activities and not tectonic faulting.

The nearest active or potentially active fault to the proposed access road alignments is the Newport-Inglewood Fault Zone, which is located about 1000 feet east of the eastern terminus of the proposed access road alignment connecting the campus to La Cienega Boulevard. Several other minor faults have been mapped in the Baldwin Hills area, but none of these faults are designated as active (see Figure 2 and Figure 4). Although these faults are not designated as active, both the faults and the ground cracks are planes of weakness in the earth's crust. Additional subsidence from oil-field activities or faulting from tectonic activity could result in movement along these cracks or faults. Based on the data available and the ongoing oil-field operations, there is the potential of surface rupture along either an earthquake fault or an existing ground crack at the site. Therefore, this hazard is **potentially significant**.

Mitigation Measures: No special precautions or restrictions (such as building setbacks or mandatory trenching) are required prior to construction of the proposed access roads because they are not structures for human occupancy. Mitigation measures consist of periodic maintenance of the roadway to identify cracking and repair the cracks. The use of geogrid reinforcement may be considered to strengthen the roadway and potentially reduce the extent of maintenance.

3.1.2 Seismic Ground Shaking

The intensity of ground shaking at a given location depends on several factors including: the earthquake magnitude, the distance from the epicenter to the site, and the response characteristics of the soils or bedrock units underlying the site. The Newport-Inglewood Fault Zone is potentially capable of producing the most intense ground accelerations at the site, since it is located about 1.2 miles from the project area (Appendix B). An estimated maximum moment magnitude on the Newport-Inglewood Fault Zone of M_w 7.1 could produce seismic shaking with peak horizontal ground accelerations estimated at about 0.75g (g is the acceleration of gravity, equal to 32 feet per second squared). Smaller events on the Newport-Inglewood Fault Zone and earthquakes on other, more distant, faults could be expected to produce peak horizontal ground accelerations at the site of up to 0.52g. Appendix B shows the seismic parameters estimated for each proposed access road alignment from various local and regional causative faults. The site is located within the Seismic Zone 4 of the Uniform Building Code, 2001 Edition.

In the site area, the hazard posed by seismic shaking is considered to be high, due to the proximity of known active faults. However, roadways are generally less affected by seismic shaking than buildings. Estimated ground motion intensities for the site are presented in Appendix B. This is a **potentially significant** impact.

Mitigation Measures: There is no realistic way in which the hazard of seismic shaking can be totally avoided, however, exposure to future ground shaking is no greater than other sites in the vicinity. Furthermore, roadways are generally less affected by seismic shaking than buildings. The effects on the proposed roadways can be mitigated through design and conformance to grading and building codes, as well as with the recommendations of the geotechnical engineer and geologist for the project, and/or other local governing agencies' codes or requirements.

This will promote safety in the event of a large earthquake and minimize damage. This is expected to reduce the effects of ground shaking to **less than significant**.

3.1.3 Secondary Effects of Seismic Shaking

Secondary effects are non-tectonic processes that are directly related to strong seismic shaking (Yeats et al., 1997). Ground deformation, including fissures, settlement, displacement and loss of bearing strength are common expressions of these processes, and is the one of the leading causes of damage to structures during a moderate to large earthquake. Secondary effects leading to ground deformation include liquefaction, lateral spreading, settlement, and landsliding. Other hazards indirectly related to seismic shaking are inundation, tsunamis, and seiches.

Liquefaction: Liquefaction occurs when loose, cohesionless, water-saturated soils (generally fine-grained sand and silt) are subjected to strong seismic ground motion of significant duration. These soils essentially behave similar to liquids, losing bearing strength. Structures built on these soils may tilt or sink when the soils liquefy. Liquefaction more often occurs in earthquake-prone areas underlain by young alluvium where the ground water table is within 50 feet of the ground surface.

The majority of the proposed access road alignment connecting the campus to La Cienega Boulevard is underlain by the Culver Sand, a bedrock unit that is not susceptible to liquefaction. This alignment does not cross a liquefaction zone (CDMG, 1999a and 1999b).

The western terminus of the proposed access road alignment connecting the campus to Jefferson Boulevard is in a liquefaction zone (CDMG, 1999a). This entire alignment is underlain by alluvium and has potentially high ground water levels due to the proximity of this area to Ballona Creek. These factors suggest that in localized areas within the project site liquefaction is **potentially significant**.

Mitigation Measures: Removal and recompaction of materials susceptible to liquefaction in structural areas, if practical, would mitigate liquefaction potential at the site. Where appropriate, subdrains should be provided for control of groundwater levels to reduce liquefaction potential. Maintenance and repair of the roadway may be required after a strong earthquake. Incorporating the above elements into the exploration, design, construction, and maintenance of the project will reduce the liquefaction hazard to **less than significant**.

Lateral Spreading: Lateral spreading is a phenomenon where large blocks of intact, nonliquefied soil move down-slope on a liquefied substrate of large areal extent (Yeats et al, 1997; Tinsley et al, 1985). The mass moves toward an unconfined area, such as a descending slope or stream-cut bluff, and is known to move on slope gradients as gentle as 1 degree. The drainages and swales between hill slopes are filled by alluvium, colluvium, landslide debris and slopewash. These unconsolidated deposits often develop soils along steep and shallow slopes in these areas. In areas within the project site covered by these soils which are underlain by liquefiable alluvium, along Ballona Creek for example, lateral spreading hazard is **potentially significant**.

Mitigation Measures: Removal and recompaction of materials susceptible to lateral spreading in structural areas would mitigate the potential for lateral spreading along the proposed access road alignments. Maintenance and repair of the roadway may be required after a strong earthquake. Incorporating the above elements into the exploration, design, construction, and maintenance of the project will reduce this potential hazard to **less than significant.**

Seismically-Induced Settlement: Strong ground shaking can cause settlement by allowing sediment particles to become more tightly packed, thereby reducing pore space. Unconsolidated, loosely packed granular alluvial deposits are especially susceptible to this phenomenon. Poorly compacted artificial fills may also experience seismically induced settlement. Because unconsolidated soils are present along the portions of the proposed access road alignments, the hazard of seismically induced settlement is **potentially significant**.

Mitigation Measures: Removal and recompaction of unsuitable materials including loose alluvium and colluvium is currently anticipated during grading operations. Removal of loose materials, generally the upper 5 to 10 feet below natural ground surface, and replacement with an engineered fill will mitigate the potential for seismic settling. Incorporating the above elements into the exploration, design and construction of the project will reduce this potential hazard to **less than significant.**

Seismically-Induced Landslides: Marginally stable slopes (including existing landslides) may be subject to landsliding caused by seismic shaking. The seismically-induced landslide hazard depends on many factors including existing slope stability, shaking potential, and presence of existing landslides. Low hills and moderately steep slopes with previously existing landslides characterize the project area that includes the proposed access road alignment connecting the campus to La Cienega Boulevard. A number of slopes in this area have been identified as areas having the potential for earthquake-induced landslides (CDMG, 1999a and 1999b). Consequently, this impact is **potentially significant**.

Mitigation Measures: Future site-specific geotechnical reports for the proposed development should analyze this potential hazard in light of the proposed grading and present recommendations to protect this portion of the project, if needed. There are numerous mitigation methods available, such as stabilizing the landslides with shear keys or a buttress (this would require offsite grading), providing setbacks, and/or constructing sediment diversion or collection devices. Following these procedures should reduce this hazard to **less than significant**.

Seismically-Induced Inundation: Strong seismic ground motion can cause dams and levees to fail, resulting in damage to structures and properties located downstream. Flood control and water-storage facilities can also fail as a result of flaws not recognized in the feasibility studies, design or construction phases of the facilities. Since no dams, large bodies of water or water storage facilities are located upstream of the project area, this hazard is **less than significant**.

Mitigation Measures: None are required.

Tsunami: A tsunami, or seismically generated sea wave, in generally created by a large, distant earthquake occurring near a deep ocean trough. Damage from tsunamis is confined to coastal areas that are 10 feet or less above sea level. Since the project is located approximately 5 miles inland from the coast, the risk of inundation from a tsunami is **less than significant.**

Mitigation Measures: None are required.

Seiches. A seiche is an earthquake-induced wave in a confined body of water, such as a lake or reservoir. Since there are no confined bodies of water on or near the site, this hazard is **less than significant**.

Mitigation Measures: None are required.

3.2 Subsidence

Regional ground subsidence general occurs due to intensive removal of subterranean fluids, typically water or oil. It is generally attributed to the consolidation of sediments as the fluid in the sediment is removed. The total load of the soils in partially saturated or saturated deposits is born by their granular structure and the fluid. When the fluid is removed, the load is born by the sediment alone and it settles. Past subsidence in the Baldwin Hills area is estimated to be up to approximately 5.6 feet near the center of the main subsidence bowl located south of the access road alternative connecting the campus to La Cienega Boulevard (Castle and Yerkes, 1976). This subsidence is attributed largely or entirely to the extraction of petroleum from the Inglewood Oil Field (Castle and Yerkes, 1976). Although regional subsidence is inevitable, the impact of regional subsidence on the proposed access road alternatives and their intended use is considered **less than significant**.

Mitigation Measures: None are required.

3.3 Slope Stability

3.3.1 Stability of Natural Slopes

Marginally stable slopes (including existing landslides) may be subject to landsliding during or shortly after prolonged, heavy rainfall or strong seismic shaking. In most cases, these are limited to relatively shallow soil failures on the steeper natural slopes. The west-facing slopes in the Baldwin Hills area have been identified as areas having the potential for instability (see Figure 5; CDMG, 1999a and 1999b). Therefore, the potential impact from landsliding would consist of the failure of the ground surface into onsite canyons. This impact is **potentially significant**.

Mitigation Measures: Future site-specific geotechnical investigations should be conducted to collect necessary data for analysis of this potential hazard and present recommendations to protect the proposed access road alignments. There are numerous mitigation methods available, such as stabilizing the landslides with shear keys or a buttress, offsite grading, or providing setbacks. Following these procedures should reduce this hazard to **less than significant**.

3.3.2 Stability of Proposed Slopes

Grading plans for the proposed access road alignments were not available at this time. For the proposed access road connecting the campus to La Cienega, it appears that grading will generally consist of lowering the onsite hills and filling in the valleys based on the topography of this area. Once a grading plan is available, a geotechnical evaluation and stability analyses of the proposed slopes should be performed. Consequently, instability of the proposed slopes is **potentially significant**.

Mitigation Measures: Several methods are available for mitigating instability in graded slopes. These methods include construction of buttresses, stabilization fills, fill keys, and shear keys and the use of geogrid reinforcement. In some cases, the slope may be redesigned at a flatter gradient, thereby eliminating or reducing the size of the stabilization device. All cut slopes should be mapped during grading to confirm the geologic conditions for which the stabilization device was designed. Most slope stabilization devices will require the inclusion of subdrain systems to transport existing or future groundwater from the stabilized area. Implementation of slope stabilization measures during design and grading of the project will reduce the hazard of slope instability in manufactured slopes to **less than significant**.

3.3.3 Stability of Temporary Slopes

Slope or side wall failure in temporary excavations for underground utilities or other structures (such as proposed stabilization devices) could occur in unconsolidated surficial soils, particularly if the cut face exposes seepage from shallow or perched ground water. Failure can also occur in steep excavation walls that expose unsupported bedding planes. The risk of failure in temporary slopes is higher because they are generally cut at a much steeper gradient. Consequently, this hazard is **potentially significant.**

Mitigation Measures: To reduce the potential for localized slope failures occurring during construction, the specific locations of underground excavations into native soils should be evaluated by the project geologist and geotechnical engineer, both prior to and during construction. Areas where excavation is required into the water-bearing zone can be temporarily dewatered, or the excavation walls can be flattened to safe gradients. In areas where the bedding is adversely oriented, the excavation wall may be shored, with shoring designed to withstand the additional loads, or the excavation walls may be flattened to a gradient that is slightly flatter than the dip of the bedding. Excavation spoils should not be placed immediately adjacent to the excavation walls unless the excavation is shored to support the added load. Other measures used to reduce the potential for slope failure include cutting and backfilling excavations in sections, and not leaving temporary excavations open for long periods of time. All Cal-OSHA regulations must be observed for excavations that will be entered by people. Following these measures will reduce this impact to **less than significant**.

3.4 Foundation Stability

3.4.1 Compressible Soils

When a load, such as fills or a building is placed, the underlying soil layers undergo a certain amount of compression. This compression is due to the deformation of the soil particles, the relocation of soil particles, and the expulsion of water or air from the void spaces between the grains. As a result, settlement can occur. Some of this settlement occurs immediately after a load is applied, while some of the settlement occurs over a period of time after placement of the load. For engineering applications, it is important to estimate the total amount of settlement that will occur upon placement of a given load, and the rate of consolidation.

Bedrock at the site, except for the very weathered zone in the upper foot or two, is not considered to be compressible. The native surficial soils (alluvium and colluvium) at the site however, are potentially compressible, especially in the upper 5 to 10 feet. Uncompacted fills are also compressible, and are unsuitable for foundation support. In addition, differential settlement across a cut/fill or bedrock/alluvium contact is also a concern. Therefore, compressible soils are **potentially significant.**

Mitigation Measures: To minimize the potential for settlement, the upper compressible layers should be densified. This is normally achieved by excavation and recompaction during grading. If this is not feasible, due to very thick or deep zones, or due to the presence of ground water, other methods are available such as overexcavating native material, surcharging, dewatering, dynamic compaction, etc. Additional measures may also include special design of the roadway such as strengthening the foundations across transitions or providing a joint in the foundation at the transition point. The access road alignments should be evaluated as necessary by the project geologist and soil engineer both prior and during construction. With the implementation of appropriate mitigation measures this impact can be reduced to a **less than significant** level.

3.4.2 Expansive Soils

Expansive soils, if left untreated, can cause damage to the road, including cracking, heaving and buckling of the road. The alluvium and colluvium in the project area (see Figure 2) contains variable amounts of clay and will generally range in expansion potential from the low to medium range. Bedrock of the Culver Sand, as well as fill soils derived from cuts into this formation, are generally in the non-expansive to slightly expansive range, with a lesser amount of localized, moderately expansive constituents. Consequently, expansive soils are **potentially significant**.

Mitigation Measures: No mitigation measures are needed if soils at or near finished grades are in the low expansive range. If expansive soils are encountered at or near design grade, removal of the expansive soils and replacement with less expansive granular soil may be utilized to mitigate the hazard. Implementation of these measures will reduce the impact of expansive soils to **less than significant**.

3.4.3 Corrosive Soils

Corrosive soils contain constituents or physical characteristics that attack concrete (water soluble sulfates) or ferrous metals (chlorides, low pH levels and low electrical resistivity). Preliminary laboratory tests for adjacent projects indicate the onsite soils have a negligible sulfate content, however they do have a potential to corrode ferrous metals. Consequently, this hazard is **potentially significant**.

Mitigation Measures: Additional testing for sulfates is required in site- specific geotechnical studies for the proposed development, and again when final rough grades are achieved. If potentially corrosive concentrations are found, these are typically treated by using concrete mix designs for foundations and other structures in contact with the soil that are resistant to sulfate attack. Additional testing is also required for corrosion potential to metals. This hazard is generally treated by wrapping or coating underground pipelines with a protective material. Depending on the degree of potential damage, a corrosion specialist may be needed. Implementing these measures during the design and construction of the access roads and any underground utilities will reduce this impact to **less than significant**.

3.4.4 Erosion

Most of the native soils onsite, as well as fill slopes constructed with native soils will have a moderate to high susceptibility to erosion. These materials, especially the Culver Sand, will be particularly prone to erosion during the grading phase, especially during heavy rains. Therefore, erosion at the site is **potentially significant**.

Mitigation Measures: Reduction of the erosion potential can be accomplished by a variety of techniques including paving or building upon exposed ground surfaces, landscaping, terracing slopes to minimize the velocity attained by runoff, placing berms or v-ditches at the tops of slopes, and installing adequate storm drain systems. Graded slopes should be protected with sprayed polymers or by other temporary means until landscaping is established.

Temporary erosion control measures should be provided during the grading phase, as required by current grading codes. Such measures typically include temporary catchment basins and/or sandbagging to control runoff and contain sediment transport within the project site.

Implementation of these erosion control measures will make this impact **less than significant**.

3.4.5 Rippability and Oversize Rock

Earth materials at the site of the proposed access road alternatives are expected to be rippable with modern earthmoving equipment. Oversize rock (fragments greater than 8 inches in diameter) are not anticipated. Therefore, this impact is **less than significant**.

Mitigation Measures: None are required.

3.5 Loss of Mineral Resources

The only mineral resource in the region of the project is petroleum, which is withdrawn primarily from the Inglewood Oil Field in the northwestern portion of the Baldwin Hills. The area that includes the proposed access road alternatives in the Inglewood Oil Field has never been developed for anything other than for production of the petroleum resource. The development of the proposed access roads for WLAC should not have an adverse impact on the Inglewood Oil Field, but will traverse the property that is being used in the production of this resource. Therefore, the loss of mineral resources due to development of the proposed access roads is **less than significant**.

Mitigation Measures: None are required.

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Aerial Photographs

Date	**Flight**	**Frames**	**Scale**	**Agency**
5/22/38	AXJ	26-100, 26-101	1:20,000	USDA
11/4/52	AXJ-4K	142, 143	1:20,000	USDA
2/12/85	Culver	578	1:36,000	I K Curtis Services Inc.
12/8/89	LA 50	66	1:36,000	I K Curtis Services Inc.

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*    Version 3.00    *
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DETERMINISTIC ESTIMATION OF
PEAK ACCELERATION FROM DIGITIZED FAULTS

JOB NUMBER: 600501-001

DATE: 07-01-2004

JOB NAME: West Los Angeles College - EIR

CALCULATION NAME: Midpoint of Alignment near Jefferson Bl.

FAULT-DATA-FILE NAME: C:\Program Files\EQFAULT1\cgsfault(2003).dat

SITE COORDINATES:
SITE LATITUDE: 34.0130
SITE LONGITUDE: 118.3854

SEARCH RADIUS: 62 mi

ATTENUATION RELATION: 23) Abrahamson & Silva (1995b/1997) Horiz.- Soil
UNCERTAINTY (M=Median, S=Sigma): M Number of Sigmas: 0.0
DISTANCE MEASURE: clodis
SCOND: 1
Basement Depth: 5.00 km Campbell SSR: Campbell SHR:
COMPUTE PEAK HORIZONTAL ACCELERATION

FAULT-DATA FILE USED: C:\Program Files\EQFAULT1\cgsfault(2003).dat

MINIMUM DEPTH VALUE (km): 0.0

EQFAULT SUMMARY

DETERMINISTIC SITE PARAMETERS

ABBREVIATED FAULT NAME	APPROXIMATE DISTANCE mi (km)	ESTIMATED MAX. EARTHQUAKE EVENT MAXIMUM EARTHQUAKE MAG.(Mw)	PEAK SITE ACCEL. g	EST. SITE INTENSITY MOD.MERC.
NEWPORT-INGLEWOOD (L.A.Basin) A	1.4(2.3)	7.1	0.515	X
SANTA MONICA	4.8(7.7)	6.6	0.400	X
HOLLYWOOD	5.0(8.0)	6.4	0.377	IX
PUENTE HILLS AB Added per CGS20	6.6(10.7)	7.1	0.363	IX
MALIBU COAST	8.6(13.8)	6.7	0.277	IX
UPPER ELYSIAN PARK THRUST AB Mod	8.7(14.0)	6.4	0.255	IX
PALOS VERDES	8.8(14.1)	7.1	0.246	IX
RAYMOND	12.0(19.3)	6.5	0.202	VIII
VERDUGO	13.3(21.4)	6.7	0.197	VIII
NORTHRIDGE (E. Oak Ridge)	16.0(25.7)	6.9	0.181	VIII
SIERRA MADRE	16.8(27.1)	7.0	0.179	VIII
ANACAPA-DUME	17.8(28.7)	7.3	0.189	VIII
SIERRA MADRE (San Fernando)	18.5(29.7)	6.7	0.150	VIII
WHITTIER AB Modified per CGS200	21.1(34.0)	6.8	0.112	VII
SANTA SUSANA	21.7(35.0)	6.6	0.125	VII
SAN GABRIEL	21.9(35.3)	7.0	0.117	VII
CLAMSHELL-SAWPIT	24.8(39.9)	6.5	0.107	VII
HOLSER	27.9(44.9)	6.5	0.096	VII
SAN JOSE	28.8(46.4)	6.5	0.093	VII
SIMI-SANTA ROSA	30.4(49.0)	6.7	0.097	VII
OAK RIDGE (Onshore)	31.4(50.5)	6.9	0.103	VII
SAN JOAQUIN HILLS AB Added 2-9-	34.0(54.7)	6.6	0.084	VII
CHINO-CENTRAL AVE. (Elsinore)	34.4(55.3)	6.7	0.087	VII
SAN CAYETANO	36.4(58.5)	6.8	0.086	VII
CUCAMONGA	37.9(61.0)	7.0	0.091	VII
NEWPORT-INGLEWOOD (Offshore) AB	39.7(63.9)	7.1	0.074	VII
SAN ANDREAS - 1857 Rupture	40.3(64.9)	7.8	0.101	VII
SAN ANDREAS - Mojave	40.3(64.9)	7.1	0.073	VII
ELSINORE-GLEN IVY	44.2(71.2)	6.8	0.058	VI
SAN ANDREAS - Carrizo	48.0(77.3)	7.2	0.066	VI
OAK RIDGE(Blind Thrust Offshore)	48.8(78.6)	6.9	0.070	VI
SANTA YNEZ (East)	48.9(78.7)	7.0	0.059	VI
VENTURA - PITAS POINT	49.0(78.9)	6.8	0.066	VI
CHANNEL IS. THRUST (Eastern)	50.6(81.4)	7.4	0.087	VII
SAN JACINTO-SAN BERNARDINO	52.8(84.9)	6.7	0.047	VI
SAN ANDREAS - Southern	53.2(85.6)	7.4	0.067	VI
SAN ANDREAS - San Bernardino	53.2(85.6)	7.3	0.064	VI
MONTALVO-OAK RIDGE TREND	53.7(86.4)	6.6	0.055	VI
M.RIDGE-ARROYO PARIDA-SANTA ANA	54.7(88.1)	6.7	0.056	VI
CLEGHORN	56.6(91.1)	6.5	0.039	V
CORONADO BANK	57.7(92.9)	7.4	0.063	VI
RED MOUNTAIN	57.8(93.1)	6.8	0.057	VI

-END OF SEARCH- 42 FAULTS FOUND WITHIN THE SPECIFIED SEARCH RADIUS.

THE NEWPORT-INGLEWOOD (L.A.Basin) FAULT IS CLOSEST TO THE SITE.
IT IS ABOUT 1.4 MILES (2.3 km) AWAY.

LARGEST MAXIMUM-EARTHQUAKE SITE ACCELERATION: 0.5150 g

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*    E Q F A U L T   *
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*    Version 3.00    *
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DETERMINISTIC ESTIMATION OF
PEAK ACCELERATION FROM DIGITIZED FAULTS

JOB NUMBER: 600501-001

DATE: 07-01-2004

JOB NAME: West Los Angeles College - EIR

CALCULATION NAME: Midpoint of Alignment near Jefferson Bl.

FAULT-DATA-FILE NAME: C:\Program Files\EQFAULT1\cgsfault(2003).dat

SITE COORDINATES:
SITE LATITUDE: 34.0130
SITE LONGITUDE: 118.3854

SEARCH RADIUS: 62 mi

ATTENUATION RELATION: 20) Sadigh et al. (1997) Horiz. - Soil
UNCERTAINTY (M=Median, S=Sigma): M Number of Sigmas: 0.0
DISTANCE MEASURE: clodis
SCOND: 1
Basement Depth: 5.00 km Campbell SSR: Campbell SHR:
COMPUTE PEAK HORIZONTAL ACCELERATION

FAULT-DATA FILE USED: C:\Program Files\EQFAULT1\cgsfault(2003).dat

MINIMUM DEPTH VALUE (km): 0.0

EQFAULT SUMMARY

DETERMINISTIC SITE PARAMETERS

ABBREVIATED FAULT NAME	APPROXIMATE DISTANCE mi (km)	ESTIMATED MAX. EARTHQUAKE EVENT: MAXIMUM EARTHQUAKE MAG.(Mw)	PEAK SITE ACCEL. g	EST. SITE INTENSITY MOD.MERC.
NEWPORT-INGLEWOOD (L.A.Basin) A	1.4(2.3)	7.1	0.504	X
SANTA MONICA	4.8(7.7)	6.6	0.417	X
HOLLYWOOD	5.0(8.0)	6.4	0.372	IX
PUENTE HILLS AB Added per CGS20	6.6(10.7)	7.1	0.409	X
MALIBU COAST	8.6(13.8)	6.7	0.305	IX
UPPER ELYSIAN PARK THRUST AB Mod	8.7(14.0)	6.4	0.258	IX
PALOS VERDES	8.8(14.1)	7.1	0.273	IX
RAYMOND	12.0(19.3)	6.5	0.212	VIII
VERDUGO	13.3(21.4)	6.7	0.215	VIII
NORTHRIDGE (E. Oak Ridge)	16.0(25.7)	6.9	0.203	VIII
SIERRA MADRE	16.8(27.1)	7.0	0.204	VIII
ANACAPA-DUME	17.8(28.7)	7.3	0.227	IX
SIERRA MADRE (San Fernando)	18.5(29.7)	6.7	0.157	VIII
WHITTIER AB Modified per CGS200	21.1(34.0)	6.8	0.113	VII
SANTA SUSANA	21.7(35.0)	6.6	0.124	VII
SAN GABRIEL	21.9(35.3)	7.0	0.123	VII
CLAMSHELL-SAWPIT	24.8(39.9)	6.5	0.100	VII
HOLSER	27.9(44.9)	6.5	0.087	VII
SAN JOSE	28.8(46.4)	6.5	0.083	VII
SIMI-SANTA ROSA	30.4(49.0)	6.7	0.090	VII
OAK RIDGE (Onshore)	31.4(50.5)	6.9	0.100	VII
SAN JOAQUIN HILLS AB Added 2-9-	34.0(54.7)	6.6	0.073	VII
CHINO-CENTRAL AVE. (Elsinore)	34.4(55.3)	6.7	0.077	VII
SAN CAYETANO	36.4(58.5)	6.8	0.078	VII
CUCAMONGA	37.9(61.0)	7.0	0.085	VII
NEWPORT-INGLEWOOD (Offshore) AB	39.7(63.9)	7.1	0.067	VI
SAN ANDREAS - 1857 Rupture	40.3(64.9)	7.8	0.106	VII
SAN ANDREAS - Mojave	40.3(64.9)	7.1	0.066	VI
ELSINORE-GLEN IVY	44.2(71.2)	6.8	0.047	VI
SAN ANDREAS - Carrizo	48.0(77.3)	7.2	0.057	VI
OAK RIDGE(Blind Thrust Offshore)	48.8(78.6)	6.9	0.057	VI
SANTA YNEZ (East)	48.9(78.7)	7.0	0.048	VI
VENTURA - PITAS POINT	49.0(78.9)	6.8	0.053	VI
CHANNEL IS. THRUST (Eastern)	50.6(81.4)	7.4	0.080	VII
SAN JACINTO-SAN BERNARDINO	52.8(84.9)	6.7	0.034	V
SAN ANDREAS - Southern	53.2(85.6)	7.4	0.058	VI
SAN ANDREAS - San Bernardino	53.2(85.6)	7.3	0.054	VI
MONTALVO-OAK RIDGE TREND	53.7(86.4)	6.6	0.040	V
M.RIDGE-ARROYO PARIDA-SANTA ANA	54.7(88.1)	6.7	0.042	VI
CLEGHORN	56.6(91.1)	6.5	0.026	V
CORONADO BANK	57.7(92.9)	7.4	0.053	VI
RED MOUNTAIN	57.8(93.1)	6.8	0.042	VI

-END OF SEARCH- 42 FAULTS FOUND WITHIN THE SPECIFIED SEARCH RADIUS.

THE NEWPORT-INGLEWOOD (L.A.Basin) FAULT IS CLOSEST TO THE SITE.
IT IS ABOUT 1.4 MILES (2.3 km) AWAY.

LARGEST MAXIMUM-EARTHQUAKE SITE ACCELERATION: 0.5036 g

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*    E Q F A U L T   *
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*    Version 3.00    *
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DETERMINISTIC ESTIMATION OF
PEAK ACCELERATION FROM DIGITIZED FAULTS

JOB NUMBER: 600501-001

DATE: 07-01-2004

JOB NAME: West Los Angeles College - EIR

CALCULATION NAME: Midpoint of Alignment near Jefferson Bl.

FAULT-DATA-FILE NAME: C:\Program Files\EQFAULT1\cgsfault(2003).dat

SITE COORDINATES:
SITE LATITUDE: 34.0130
SITE LONGITUDE: 118.3854

SEARCH RADIUS: 62 mi

ATTENUATION RELATION: 14) Campbell & Bozorgnia (1997 Rev.) - Alluvium
UNCERTAINTY (M=Median, S=Sigma): M Number of Sigmas: 0.0
DISTANCE MEASURE: cdist
SCOND: 1
Basement Depth: 5.00 km Campbell SSR: 0 Campbell SHR: 0
COMPUTE PEAK HORIZONTAL ACCELERATION

FAULT-DATA FILE USED: C:\Program Files\EQFAULT1\cgsfault(2003).dat

MINIMUM DEPTH VALUE (km): 3.0

EQFAULT SUMMARY

DETERMINISTIC SITE PARAMETERS

ABBREVIATED FAULT NAME	APPROXIMATE DISTANCE mi (km)	ESTIMATED MAX. EARTHQUAKE EVENT: MAXIMUM EARTHQUAKE MAG.(Mw)	PEAK SITE ACCEL. g	EST. SITE INTENSITY MOD.MERC.
NEWPORT-INGLEWOOD (L.A.Basin) A	2.4(3.8)	7.1	0.492	X
SANTA MONICA	5.6(9.0)	6.6	0.450	X
HOLLYWOOD	5.9(9.5)	6.4	0.404	X
PUENTE HILLS AB Added per CGS20	6.6(10.7)	7.1	0.464	X
UPPER ELYSIAN PARK THRUST AB Mod	8.7(14.0)	6.4	0.284	IX
MALIBU COAST	8.8(14.1)	6.7	0.328	IX
PALOS VERDES	8.9(14.4)	7.1	0.329	IX
RAYMOND	12.4(20.0)	6.5	0.203	VIII
VERDUGO	15.3(24.6)	6.7	0.181	VIII
NORTHRIDGE (E. Oak Ridge)	16.0(25.7)	6.9	0.195	VIII
ANACAPA-DUME	18.5(29.8)	7.3	0.211	VIII
SIERRA MADRE	18.9(30.4)	7.0	0.170	VIII
SIERRA MADRE (San Fernando)	20.4(32.9)	6.7	0.125	VII
WHITTIER AB Modified per CGS200	21.4(34.4)	6.8	0.118	VII
SAN GABRIEL	22.0(35.4)	7.0	0.133	VIII
SANTA SUSANA	23.2(37.4)	6.6	0.098	VII
CLAMSHELL-SAWPIT	24.8(39.9)	6.5	0.084	VII
HOLSER	27.9(44.9)	6.5	0.071	VI
SAN JOSE	28.8(46.4)	6.5	0.068	VI
SIMI-SANTA ROSA	31.1(50.0)	6.7	0.071	VI
OAK RIDGE (Onshore)	31.4(50.5)	6.9	0.082	VII
CHINO-CENTRAL AVE. (Elsinore)	34.4(55.3)	6.7	0.062	VI
SAN JOAQUIN HILLS AB Added 2-9-	34.9(56.2)	6.6	0.056	VI
SAN CAYETANO	37.5(60.3)	6.8	0.060	VI
CUCAMONGA	37.9(61.0)	7.0	0.068	VI
NEWPORT-INGLEWOOD (Offshore) AB	39.8(64.0)	7.1	0.071	VI
SAN ANDREAS - 1857 Rupture	40.4(65.0)	7.8	0.124	VII
SAN ANDREAS - Mojave	40.4(65.0)	7.1	0.069	VI
ELSINORE-GLEN IVY	44.3(71.3)	6.8	0.047	VI
SAN ANDREAS - Carrizo	48.0(77.3)	7.2	0.061	VI
OAK RIDGE(Blind Thrust Offshore)	48.8(78.6)	6.9	0.045	VI
SANTA YNEZ (East)	48.9(78.7)	7.0	0.050	VI
VENTURA - PITAS POINT	49.3(79.4)	6.8	0.041	V
CHANNEL IS. THRUST (Eastern)	50.6(81.4)	7.4	0.063	VI
SAN JACINTO-SAN BERNARDINO	52.8(84.9)	6.7	0.035	V
SAN ANDREAS - Southern	53.2(85.6)	7.4	0.063	VI
SAN ANDREAS - San Bernardino	53.2(85.6)	7.3	0.058	VI
MONTALVO-OAK RIDGE TREND	53.7(86.4)	6.6	0.031	V
M.RIDGE-ARROYO PARIDA-SANTA ANA	55.7(89.6)	6.7	0.032	V
CLEGHORN	56.7(91.2)	6.5	0.026	V
CORONADO BANK	57.8(93.0)	7.4	0.057	VI
RED MOUNTAIN	59.0(94.9)	6.8	0.032	V

-END OF SEARCH- 42 FAULTS FOUND WITHIN THE SPECIFIED SEARCH RADIUS.

THE NEWPORT-INGLEWOOD (L.A.Basin) FAULT IS CLOSEST TO THE SITE.
IT IS ABOUT 2.4 MILES (3.8 km) AWAY.

LARGEST MAXIMUM-EARTHQUAKE SITE ACCELERATION: 0.4923 g

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*    E Q F A U L T   *
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*    Version 3.00    *
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DETERMINISTIC ESTIMATION OF
PEAK ACCELERATION FROM DIGITIZED FAULTS

JOB NUMBER: 600501-001

DATE: 07-01-2004

JOB NAME: West Los Angeles College - EIR

CALCULATION NAME: Midpoint of Option C

FAULT-DATA-FILE NAME: C:\Program Files\EQFAULT1\cgsfault(2003).dat

SITE COORDINATES:
SITE LATITUDE: 34.0111
SITE LONGITUDE: 118.3788

SEARCH RADIUS: 62 mi

ATTENUATION RELATION: 22) Abrahamson & Silva (1995b/1997) Horiz.- Rock
UNCERTAINTY (M=Median, S=Sigma): M   Number of Sigmas: 0.0
DISTANCE MEASURE: clodis
SCOND: 1
Basement Depth: 5.00 km   Campbell SSR: 0   Campbell SHR: 0
COMPUTE PEAK HORIZONTAL ACCELERATION

FAULT-DATA FILE USED: C:\Program Files\EQFAULT1\cgsfault(2003).dat

MINIMUM DEPTH VALUE (km): 0.0

EQFAULT SUMMARY

DETERMINISTIC SITE PARAMETERS

ABBREVIATED FAULT NAME	APPROXIMATE DISTANCE mi (km)	ESTIMATED MAX. EARTHQUAKE EVENT: MAXIMUM EARTHQUAKE MAG.(Mw)	PEAK SITE ACCEL. g	EST. SITE INTENSITY MOD.MERC.
NEWPORT-INGLEWOOD (L.A.Basin) A	1.2(1.9)	7.1	0.753	XI
SANTA MONICA	5.0(8.1)	6.6	0.512	X
HOLLYWOOD	5.2(8.4)	6.4	0.474	X
PUENTE HILLS AB Added per CGS20	6.5(10.4)	7.1	0.480	X
UPPER ELYSIAN PARK THRUST AB Mod	8.6(13.8)	6.4	0.303	IX
PALOS VERDES	8.9(14.3)	7.1	0.283	IX
MALIBU COAST	8.9(14.4)	6.7	0.320	IX
RAYMOND	11.7(18.9)	6.5	0.228	IX
VERDUGO	13.2(21.2)	6.7	0.218	IX
NORTHRIDGE (E. Oak Ridge)	16.2(26.1)	6.9	0.191	VIII
SIERRA MADRE	16.8(27.0)	7.0	0.193	VIII
ANACAPA-DUME	18.1(29.2)	7.3	0.203	VIII
SIERRA MADRE (San Fernando)	18.5(29.8)	6.7	0.153	VIII
WHITTIER AB Modified per CGS200	20.8(33.4)	6.8	0.110	VII
SAN GABRIEL	21.9(35.3)	7.0	0.113	VII
SANTA SUSANA	22.1(35.5)	6.6	0.121	VII
CLAMSHELL-SAWPIT	24.5(39.5)	6.5	0.103	VII
HOLSER	28.1(45.3)	6.5	0.089	VII
SAN JOSE	28.5(45.8)	6.5	0.087	VII
SIMI-SANTA ROSA	30.8(49.6)	6.7	0.089	VII
OAK RIDGE (Onshore)	31.7(51.0)	6.9	0.096	VII
SAN JOAQUIN HILLS AB Added 2-9-	33.6(54.1)	6.6	0.077	VII
CHINO-CENTRAL AVE. (Elsinore)	34.1(54.8)	6.7	0.080	VII
SAN CAYETANO	36.7(59.0)	6.8	0.078	VII
CUCAMONGA	37.6(60.5)	7.0	0.085	VII
NEWPORT-INGLEWOOD (Offshore) AB	39.3(63.3)	7.1	0.066	VI
SAN ANDREAS - 1857 Rupture	40.3(64.8)	7.8	0.096	VII
SAN ANDREAS - Mojave	40.3(64.8)	7.1	0.064	VI
ELSINORE-GLEN IVY	43.9(70.6)	6.8	0.049	VI
SAN ANDREAS - Carrizo	48.2(77.6)	7.2	0.057	VI
OAK RIDGE(Blind Thrust Offshore)	49.2(79.2)	6.9	0.060	VI
SANTA YNEZ (East)	49.2(79.2)	7.0	0.049	VI
VENTURA - PITAS POINT	49.4(79.5)	6.8	0.057	VI
CHANNEL IS. THRUST (Eastern)	51.0(82.0)	7.4	0.079	VII
SAN JACINTO-SAN BERNARDINO	52.4(84.4)	6.7	0.038	V
SAN ANDREAS - Southern	52.9(85.1)	7.4	0.058	VI
SAN ANDREAS - San Bernardino	52.9(85.1)	7.3	0.055	VI
MONTALVO-OAK RIDGE TREND	54.1(87.0)	6.6	0.045	VI
M.RIDGE-ARROYO PARIDA-SANTA ANA	55.1(88.7)	6.7	0.047	VI
CLEGHORN	56.4(90.7)	6.5	0.031	V
CORONADO BANK	57.5(92.5)	7.4	0.054	VI
RED MOUNTAIN	58.3(93.8)	6.8	0.047	VI

-END OF SEARCH- 42 FAULTS FOUND WITHIN THE SPECIFIED SEARCH RADIUS.

THE NEWPORT-INGLEWOOD (L.A.Basin) FAULT IS CLOSEST TO THE SITE.
IT IS ABOUT 1.2 MILES (1.9 km) AWAY.

LARGEST MAXIMUM-EARTHQUAKE SITE ACCELERATION: 0.7525 g

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                         *    E Q F A U L T   *
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                         *    Version 3.00    *
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                       DETERMINISTIC ESTIMATION OF
                  PEAK ACCELERATION FROM DIGITIZED FAULTS


JOB NUMBER: 600501-001
                                                     DATE: 07-01-2004

JOB NAME: West Los Angeles College - EIR

CALCULATION NAME: Midpoint of Option C

FAULT-DATA-FILE NAME: C:\Program Files\EQFAULT1\cgsfault(2003).dat

SITE COORDINATES:
   SITE LATITUDE:  34.0111
   SITE LONGITUDE:  118.3788

SEARCH RADIUS:   62  mi

ATTENUATION RELATION:  21) Sadigh et al. (1997) Horiz. - Rock
   UNCERTAINTY (M=Median, S=Sigma): M       Number of Sigmas:  0.0
   DISTANCE MEASURE:  clodis
   SCOND:   1
   Basement Depth:  5.00 km     Campbell SSR:  0     Campbell SHR:  0
   COMPUTE PEAK HORIZONTAL ACCELERATION

FAULT-DATA FILE USED:  C:\Program Files\EQFAULT1\cgsfault(2003).dat

MINIMUM DEPTH VALUE (km):  0.0
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EQFAULT SUMMARY

DETERMINISTIC SITE PARAMETERS

ABBREVIATED FAULT NAME	APPROXIMATE DISTANCE mi (km)	ESTIMATED MAX. EARTHQUAKE EVENT: MAXIMUM EARTHQUAKE MAG.(Mw)	PEAK SITE ACCEL. g	EST. SITE INTENSITY MOD.MERC.
NEWPORT-INGLEWOOD (L.A.Basin) A	1.2(1.9)	7.1	0.663	XI
SANTA MONICA	5.0(8.1)	6.6	0.447	X
HOLLYWOOD	5.2(8.4)	6.4	0.397	X
PUENTE HILLS AB Added per CGS20	6.5(10.4)	7.1	0.451	X
UPPER ELYSIAN PARK THRUST AB Mod	8.6(13.8)	6.4	0.269	IX
PALOS VERDES	8.9(14.3)	7.1	0.302	IX
MALIBU COAST	8.9(14.4)	6.7	0.304	IX
RAYMOND	11.7(18.9)	6.5	0.212	VIII
VERDUGO	13.2(21.2)	6.7	0.210	VIII
NORTHRIDGE (E. Oak Ridge)	16.2(26.1)	6.9	0.187	VIII
SIERRA MADRE	16.8(27.0)	7.0	0.191	VIII
ANACAPA-DUME	18.1(29.2)	7.3	0.208	VIII
SIERRA MADRE (San Fernando)	18.5(29.8)	6.7	0.142	VIII
WHITTIER AB Modified per CGS200	20.8(33.4)	6.8	0.109	VII
SAN GABRIEL	21.9(35.3)	7.0	0.116	VII
SANTA SUSANA	22.1(35.5)	6.6	0.105	VII
CLAMSHELL-SAWPIT	24.5(39.5)	6.5	0.084	VII
HOLSER	28.1(45.3)	6.5	0.069	VI
SAN JOSE	28.5(45.8)	6.5	0.068	VI
SIMI-SANTA ROSA	30.8(49.6)	6.7	0.071	VI
OAK RIDGE (Onshore)	31.7(51.0)	6.9	0.079	VII
SAN JOAQUIN HILLS AB Added 2-9-	33.6(54.1)	6.6	0.057	VI
CHINO-CENTRAL AVE. (Elsinore)	34.1(54.8)	6.7	0.061	VI
SAN CAYETANO	36.7(59.0)	6.8	0.059	VI
CUCAMONGA	37.6(60.5)	7.0	0.066	VI
NEWPORT-INGLEWOOD (Offshore) AB	39.3(63.3)	7.1	0.056	VI
SAN ANDREAS - 1857 Rupture	40.3(64.8)	7.8	0.091	VII
SAN ANDREAS - Mojave	40.3(64.8)	7.1	0.054	VI
ELSINORE-GLEN IVY	43.9(70.6)	6.8	0.037	V
SAN ANDREAS - Carrizo	48.2(77.6)	7.2	0.044	VI
OAK RIDGE(Blind Thrust Offshore)	49.2(79.2)	6.9	0.040	V
SANTA YNEZ (East)	49.2(79.2)	7.0	0.036	V
VENTURA - PITAS POINT	49.4(79.5)	6.8	0.037	V
CHANNEL IS. THRUST (Eastern)	51.0(82.0)	7.4	0.057	VI
SAN JACINTO-SAN BERNARDINO	52.4(84.4)	6.7	0.025	V
SAN ANDREAS - Southern	52.9(85.1)	7.4	0.045	VI
SAN ANDREAS - San Bernardino	52.9(85.1)	7.3	0.042	VI
MONTALVO-OAK RIDGE TREND	54.1(87.0)	6.6	0.026	V
M.RIDGE-ARROYO PARIDA-SANTA ANA	55.1(88.7)	6.7	0.028	V
CLEGHORN	56.4(90.7)	6.5	0.019	IV
CORONADO BANK	57.5(92.5)	7.4	0.040	V
RED MOUNTAIN	58.3(93.8)	6.8	0.028	V

-END OF SEARCH- 42 FAULTS FOUND WITHIN THE SPECIFIED SEARCH RADIUS.

THE NEWPORT-INGLEWOOD (L.A.Basin) FAULT IS CLOSEST TO THE SITE.
IT IS ABOUT 1.2 MILES (1.9 km) AWAY.

LARGEST MAXIMUM-EARTHQUAKE SITE ACCELERATION: 0.6632 g

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*                     *
*    E Q F A U L T    *
*                     *
*    Version 3.00     *
*                     *
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DETERMINISTIC ESTIMATION OF
PEAK ACCELERATION FROM DIGITIZED FAULTS

JOB NUMBER: 600501-001

DATE: 07-01-2004

JOB NAME: West Los Angeles College - EIR

CALCULATION NAME: Midpoint of Option C

FAULT-DATA-FILE NAME: C:\Program Files\EQFAULT1\cgsfault(2003).dat

SITE COORDINATES:
SITE LATITUDE: 34.0111
SITE LONGITUDE: 118.3788

SEARCH RADIUS: 62 mi

ATTENUATION RELATION: 15) Campbell & Bozorgnia (1997 Rev.) - Soft Rock
UNCERTAINTY (M=Median, S=Sigma): M Number of Sigmas: 0.0
DISTANCE MEASURE: cdist
SCOND: 1
Basement Depth: 5.00 km Campbell SSR: 1 Campbell SHR: 0
COMPUTE PEAK HORIZONTAL ACCELERATION

FAULT-DATA FILE USED: C:\Program Files\EQFAULT1\cgsfault(2003).dat

MINIMUM DEPTH VALUE (km): 3.0

EQFAULT SUMMARY

DETERMINISTIC SITE PARAMETERS

ABBREVIATED FAULT NAME	APPROXIMATE DISTANCE mi (km)	ESTIMATED MAX. EARTHQUAKE EVENT: MAXIMUM EARTHQUAKE MAG.(Mw)	PEAK SITE ACCEL. g	EST. SITE INTENSITY MOD.MERC.
NEWPORT-INGLEWOOD (L.A.Basin) A	2.2(3.6)	7.1	0.617	X
SANTA MONICA	5.8(9.4)	6.6	0.463	X
HOLLYWOOD	6.2(9.9)	6.4	0.410	X
PUENTE HILLS AB Added per CGS20	6.5(10.4)	7.1	0.491	X
UPPER ELYSIAN PARK THRUST AB Mod	8.6(13.8)	6.4	0.285	IX
MALIBU COAST	9.1(14.7)	6.7	0.309	IX
PALOS VERDES	9.1(14.7)	7.1	0.318	IX
RAYMOND	12.2(19.6)	6.5	0.194	VIII
VERDUGO	15.1(24.3)	6.7	0.165	VIII
NORTHRIDGE (E. Oak Ridge)	16.2(26.1)	6.9	0.170	VIII
SIERRA MADRE	18.8(30.3)	7.0	0.148	VIII
ANACAPA-DUME	18.9(30.4)	7.3	0.178	VIII
SIERRA MADRE (San Fernando)	20.5(33.0)	6.7	0.107	VII
WHITTIER AB Modified per CGS200	21.0(33.8)	6.8	0.102	VII
SAN GABRIEL	22.0(35.4)	7.0	0.113	VII
SANTA SUSANA	23.5(37.9)	6.6	0.081	VII
CLAMSHELL-SAWPIT	24.5(39.5)	6.5	0.070	VI
HOLSER	28.1(45.3)	6.5	0.057	VI
SAN JOSE	28.5(45.8)	6.5	0.056	VI
SIMI-SANTA ROSA	31.4(50.6)	6.7	0.056	VI
OAK RIDGE (Onshore)	31.7(51.0)	6.9	0.064	VI
CHINO-CENTRAL AVE. (Elsinore)	34.1(54.8)	6.7	0.049	VI
SAN JOAQUIN HILLS AB Added 2-9-	34.5(55.6)	6.6	0.045	VI
CUCAMONGA	37.6(60.5)	7.0	0.053	VI
SAN CAYETANO	37.8(60.8)	6.8	0.045	VI
NEWPORT-INGLEWOOD (Offshore) AB	39.4(63.4)	7.1	0.055	VI
SAN ANDREAS - 1857 Rupture	40.3(64.9)	7.8	0.095	VII
SAN ANDREAS - Mojave	40.3(64.9)	7.1	0.053	VI
ELSINORE-GLEN IVY	43.9(70.6)	6.8	0.036	V
SAN ANDREAS - Carrizo	48.2(77.6)	7.2	0.044	VI
OAK RIDGE(Blind Thrust Offshore)	49.2(79.2)	6.9	0.032	V
SANTA YNEZ (East)	49.2(79.2)	7.0	0.036	V
VENTURA - PITAS POINT	49.7(80.0)	6.8	0.029	V
CHANNEL IS. THRUST (Eastern)	51.0(82.0)	7.4	0.045	VI
SAN JACINTO-SAN BERNARDINO	52.4(84.4)	6.7	0.025	V
SAN ANDREAS - Southern	52.9(85.2)	7.4	0.046	VI
SAN ANDREAS - San Bernardino	52.9(85.2)	7.3	0.042	VI
MONTALVO-OAK RIDGE TREND	54.1(87.0)	6.6	0.022	IV
M.RIDGE-ARROYO PARIDA-SANTA ANA	56.0(90.2)	6.7	0.022	IV
CLEGHORN	56.4(90.7)	6.5	0.019	IV
CORONADO BANK	57.5(92.5)	7.4	0.041	V
RED MOUNTAIN	59.3(95.5)	6.8	0.022	IV

-END OF SEARCH- 42 FAULTS FOUND WITHIN THE SPECIFIED SEARCH RADIUS.

THE NEWPORT-INGLEWOOD (L.A.Basin) FAULT IS CLOSEST TO THE SITE.
IT IS ABOUT 2.2 MILES (3.6 km) AWAY.

LARGEST MAXIMUM-EARTHQUAKE SITE ACCELERATION: 0.6167 g