CAMPUS PARK PROJECT

APPENDIX F

GEOLOGY/PALEONTOLOGY

SPA 03-008, GPA 03-004, R03-014, VTM 5338 RPL7,
S 07-030, S 07-031, LOG No. 03-02-059
State Clearinghouse No. 2005011092

for the

DRAFT FINAL SUBSEQUENT
ENVIRONMENTAL IMPACT REPORT

DECEMBER 3, 2010

FINAL ENVIRONMENTAL IMPACT REPORT
GEOLOGY/PALEONTOLOGY TECHNICAL REPORTS
INFORMATION FOR THE READER

This document consists of the Geology and Paleontology Technical Reports for the Campus Park Project (Proposed Project or Project) and analyzes geotechnical and paleontological resource elements associated with construction and operation of the Project. Since circulation of the Project Draft Environmental Impact Report (EIR) and associated technical reports, refinements in Project description have been implemented in response to comments received.

The majority of Project refinements occur west of future Horse Ranch Creek Road and all of them would be south of proposed Harvest Glen Lane. The majority of the developed uses and their construction footprints (residential, office professional, recreational and commercial) remain the same as previously analyzed.

South of future Harvest Glen Lane and west of future Horse Ranch Creek Road, the Proposed Project has been refined to: (1) eliminate some development areas, (2) modify specifics of development detail in some areas, and (3) eliminate the potential for connection to an off-site future wastewater treatment plant (WTP) to be constructed by others. Specifics of road design improvements also vary.

Overall, primary design changes result in 325 fewer multi-family homes (a reduction of 41 percent), and an increase in the biological open space preserve of 20.7 acres (or 11 percent). See Figure A for a comparison of the Project evaluated in the Draft EIR with the current plan.

Project refinements relevant to this technical report are addressed below.

Relevant Refinements to Project Description

The analyzed Project footprint included development west of future Horse Ranch Creek Road and north of SR 76 that has now been eliminated or slightly relocated. In addition, the off-site portion of Pankey Road/Pala Mesa Drive has been shifted in response to a request from the property owner, Campus Park West.

Technical Analysis Modifications Based on Project Description Refinements

Geotechnical Assessment

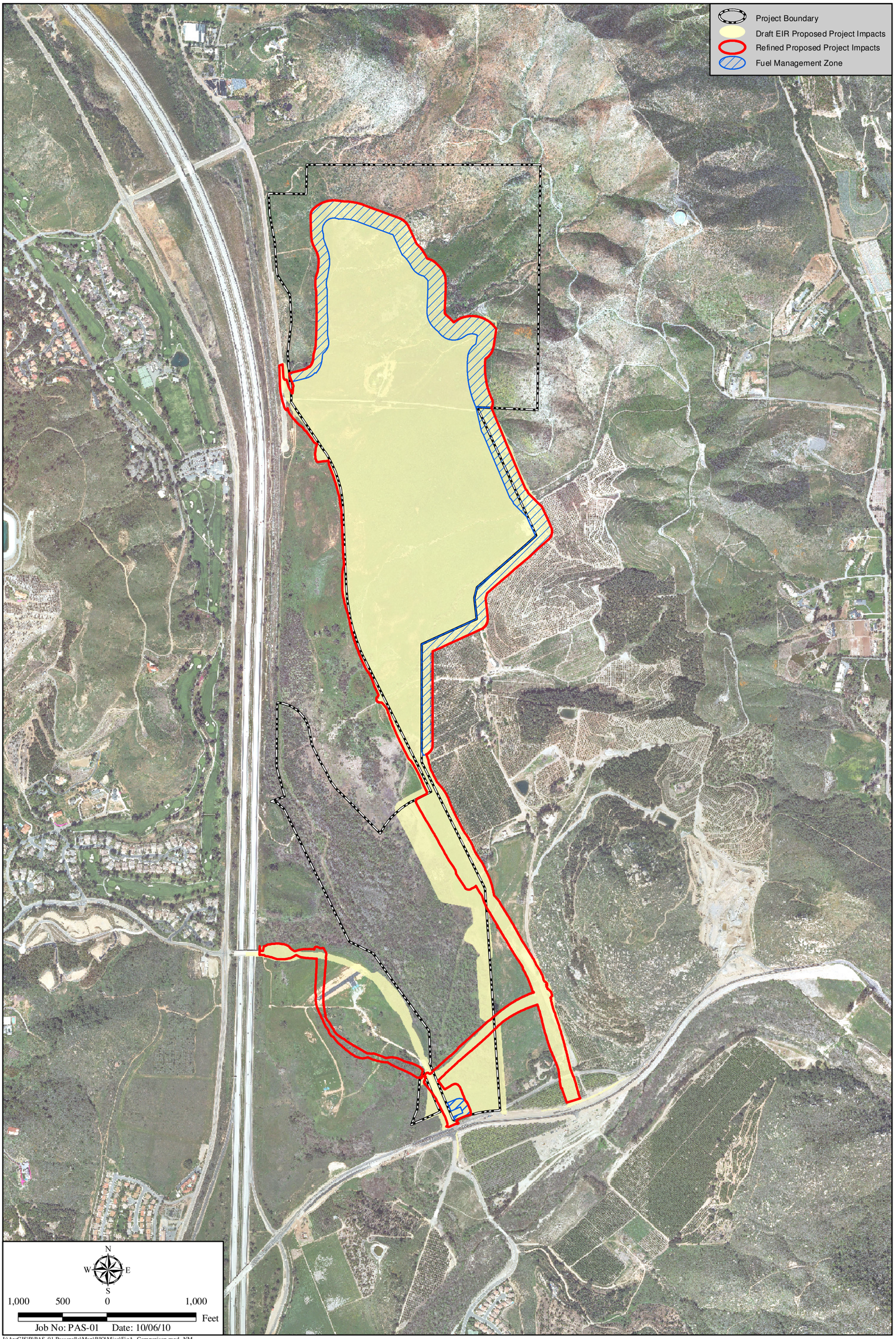
The described changes to the Project would result in an overall reduction in the potential extent of Project-related impacts associated with erosion/sedimentation, expansive soils, manufactured slope stability (due to fewer new/modified slopes), settlement/collapse, oversize materials generated during construction/excavation, and seismically induced ground acceleration (ground shaking) and liquefaction. The reduction in the extent of potential impacts is associated with the corresponding reduction in proposed excavation and construction. The assessment of potential impacts, mitigation measures and remedial recommendations/requirements in the circulated

Geotechnical Assessment remain accurate for the refined Project design and are consistent with commitments identified in the EIR as Project Environmental Design Considerations. No change to the environmental design considerations or significance conclusions reached in conformance with the California Environmental Quality Act (CEQA) would occur and no change is required to the attached geology technical analysis.

Paleontological Resource Assessment

The described changes to the Project would result in an overall reduction in the potential extent of Project-related impacts associated with disturbance of Quaternary (Pleistocene) terrace deposits. The described reduction is associated with reduction in proposed excavation and construction. The Project will incorporate identified and committed to measures to address potential paleontological impacts, and to ensure conformance with applicable regulatory requirements. No change to the environmental design considerations or significance conclusions reached in conformance with CEQA would occur and no change is required to the attached paleontology technical analysis.

Each of the above-cited and additional specific revisions are now included as part of the public record and will be before the Board of Supervisors during their consideration of the Project.



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Impact Comparison

CAMPUS PARK

HELIX

Figure A

GEOTECHNICAL ASSESSMENT

UPDATED GEOTECHNICAL ASSESSMENT
PROPOSED CAMPUS PARK
PALA ROAD, TM 5338
SAN DIEGO COUNTY

Prepared for:

Passerelle, LLC
402 W. Broadway, Ste. 1320
San Diego, CA 92101-3542

S.E.A. 201171-04
April 11, 2007

SHEPARDSON
ENGINEERING ASSOCIATES INC.
10035 Prospect Avenue, Suite 101 ▪ Santee, CA 92071

SHEPARDSON
ENGINEERING ASSOCIATES INC.

Geotechnical Consultants:
Engineers-Geologists

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April 11, 2007 S.E.A. 201171-04

Passerelle, LLC
402 W. Broadway, Ste. 1320
San Diego, CA 92101-3542

ATTENTION: Mr. David Davis

SUBJECT: Geotechnical Assessment
Proposed Campus Park
Pala Road, TM 5338
San Diego County, California

Gentlemen:

In accordance with your request, we herein submit our report of a geotechnical assessment for the proposed Campus Park project. The geotechnical descriptions and findings contained herein are a compendium based on data developed by prior geotechnical consultants and supplemented by our investigations in the area. We have also reviewed the geotechnical report prepared for the adjoining property to the east known as the Pankey Parcel.

This report is intended to provide an assessment of geotechnical issues that may impact the environment of the site.

A major geotechnical issue for this site is the saturated alluvium along the lower southern portion. High compressibility and a risk for liquefaction during a design seismic event dictate the need for remediation prior to siting of building improvements in this area. Possible remediation measures are discussed in the following report.

Other geotechnical issues have relatively low impact on the site and the development. These issues are discussed in further detail herein.

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UPDATED GEOTECHNICAL ASSESSMENT
PROPOSED CAMPUS PARK
PALA ROAD, TM 5338
SAN DIEGO COUNTY

April 11, 2007 S.E.A. 201171-04

1.0 PROJECT DESCRIPTION

The Campus Park project will be a mixed-use development. Much of the acreage will be graded into 533 individual single-family dwelling unit pads and interior streets, with the rest dedicated to commercial, office, multi-family residential development, park sites, light industrial, and biological open space. The location of the various land uses at the site are shown on the Land Use Map, Figure No. 1. Horse Ranch Creek Road will be constructed to extend offsite for ultimate connection to SR 76. In addition, offsite improvements include extending Pala Mesa Drive easterly across the southern portions of the property, to intersect with the newly proposed Horse Ranch Creek Road. Intersection improvements on Old Highway 395 and SR 76 are also planned as parts of the project. A total of 185 acres is planned as open space for native habitats.

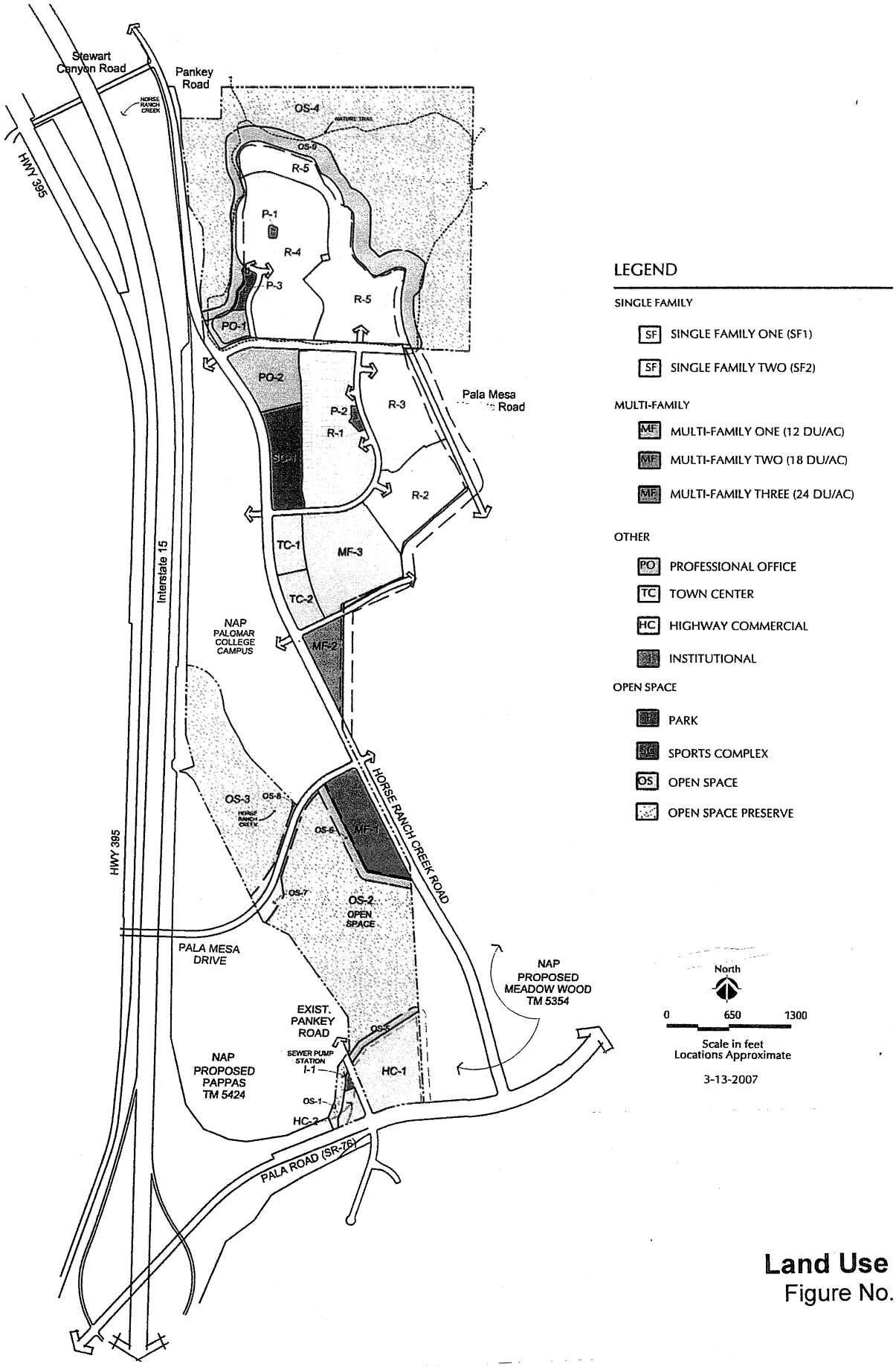
2.0 SITE DESCRIPTION

The site is located in the northeast quadrant of the intersection of Interstate 15 and State Route 76 (Pala Rd.) See Figure No. 2 for Vicinity Map. Elevations on the property range from a high of 850 feet msl at the northeast corner, to a low of 254 msl at the southern end. Prevailing drainage is to the south and the west, along moderately steep, westerly descending canyons in the northern one quarter of the property, to more gentle slopes and valleys draining south on the rest of the property. The Site Plan for the project is provided as plate A1 of Appendix A.

Onsite topography is variable; steeper, somewhat rocky slopes characterize the northern quarter, while moderate to gentle slopes occupy the next quarter to the south. Most of the southerly terrain is nearly flat. The site drains southerly and eventually into the San Luis Ray River basin that lies south of State Route 76.

Onsite vegetation includes native weeds and grasses over the flatter portions, some trees in the low-lying southerly alluvial areas , and hydrophytic vegetation. The northerly, moderately steep slopes are covered with coastal sage scrub.

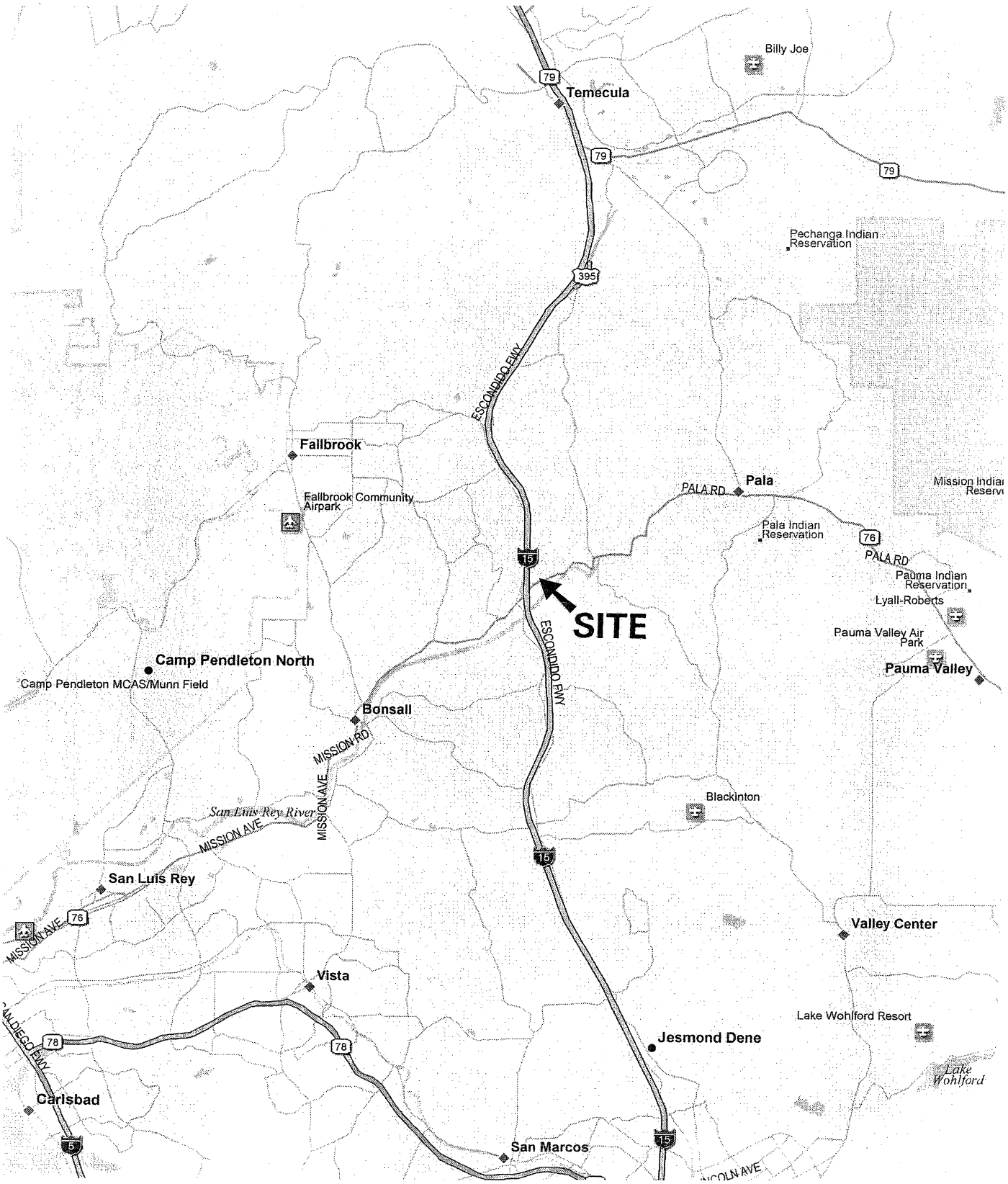
Since the property has been used for agriculture, a few farm buildings, water wells, reservoirs and other structures are found onsite. There is an existing crude network of dirt roads and trails.



Land Use Map
Figure No. 1

Prepared by Helix Environmental Planning, Inc.

VICINITY MAP
FIGURE NO. 2



3.0 ON-SITE EXPLORATIONS

As noted on the attached Reference List, both Woodward-Clyde Consultants and Pacific Soils Engineering completed field explorations consisting of borings, backhoe trenches, and seismic traverses. The locations of these explorations are plotted on the Site Plan, Plate A1 in the Appendix. Woodward-Clyde Consultants (1982), drilled, logged and sampled 11 small-diameter borings on this property to depths of 11.5 to 39.5 feet. Pacific Soils completed 5 large-diameter bucket auger borings on this property, to depths ranging from 3.5 to 58 feet. They also excavated 11 backhoe test pits, ranging in depths from 3.5 feet to 20 feet, and completed one seismic traverse on this property, to assess rock rippability. We have reviewed this data and it is available in our files.

Our office conducted additional subsurface explorations, primarily for an adjacent parcel, to supplement the prior investigations. The latest exploration included one small diameter boring on this property that was 35 feet deep. Also, one Cone Penetration Test (CPT) probe was conducted within the site. This probe was 33 feet deep. These explorations were focused in the alluvial area of the site.

4.0 FINDINGS

4.1 General Geology

There are 4 major geologic units onsite. These are, in order of decreasing age, Gabbroic bedrock (**Kgb**), Granitic bedrock (**Kgr**), Terrace Deposits (**Qt**), and Alluvium (**Qal**). The generalized location of these geologic units , and the contacts between them, are shown on the Site Plan, Plate No. A1. The locations shown are derived from a combination of mapping by Pacific Soils, and our review of the site topography. In addition, there are small, isolated areas of artificial fill onsite, associated primarily with agricultural water impoundments.

Kgb:

The Gabbroic rocks are Cretaceous age, and represent the prevalent basement bedrock in the area. They generally are deeply weathered, and form smooth, rounded slopes. Typically, they may be rippable to depths of 30 feet or more.

Kgr:

The Granitic rocks are also Cretaceous age bedrock, but are only present in a limited area within this project. Numerous rounded boulders are exposed on the hillside area underlain by the granitics. These rocks generally weather to considerable depths even though hard rock boulders may be exposed on the surface. They are typically rippable to depths on the order of 30 ft.

Qt:

Pacific Soils has classified all of the deposits which lie between the steeper bedrock slopes and the flat alluvial valley as "Terrace Deposits". We think that these are more likely a combination of colluvial, or

slopewash deposits, and Terrace deposits. A review of their logs shows that the thicknesses of these deposits thin rapidly upslope. Based solely on a review of the topography in the northeastern portion of the site, we believe there is a remote possibility that portions of this unit, mapped by Pacific Soils, could actually be debris flow in origin. At this point, this is only a suspicion inferred from the appearance of contours, and our familiarity with such features. Obviously, a future investigation will be required to resolve these distinctions. Pacific Soils describes these soils as silty to clayey sands, reddish brown to light brown in color.

Qal:

The upper portion of these soils represent recent water-laid deposits, which are part of the San Luis Rey River flood plain. They are generally silty sands with clean sand interbeds and are relatively unconsolidated. They contain groundwater at shallow depths. Certain intervals within these sediments have been determined to be subject to liquefaction during a severe seismic event. This issue is discussed in a later section. The alluvial soils are also moderately compressible under potential loading from fills or building loads.

Where the alluvium exceeds approximately 35 feet in depth it becomes significantly denser and is likely an "older Alluvium", or possibly similar to the surrounding Terrace Deposits.

4.2 Groundwater

Groundwater was found at shallow depths in the alluvial deposits. This is likely perched groundwater retained in the loose sandy sediments above the bedrock basement. The shallow groundwater is in part contributed to by the infiltration of irrigation and rainwater from the agricultural groves, the Pala Mesa Golf Course, and other developments to the north. Based on our explorations and the two prior reports, groundwater levels appear to be relatively consistent through time. Groundwater in the lower lying alluvial area is near or at the ground surface.

We understand that there were a number of agricultural wells serving the residence and ranch within the property.

4.3 Faults

The results of a prior review of a larger parcel, which included this project, by the County's hydrogeologist brought to our attention that the SANDAG GIS data indicates there is a mapped fault trending generally east-west into this area from the east. It was stated that the SANDAG data was based on information obtained

from the California Division of Mines and Geology Fault Activity Map, published in 1994. Our review of this 1994 map shows that the subject fault is designated as "Pre-Quaternary" in age. Pre-Quaternary faults are considered inactive, and therefore are not typically of concern. It appears that the SANDAG data, or the County's hydrogeologist, may have misinterpreted the designated age of this suspected fault since it was stated as being Quaternary in age in the subject review.

In researching the original source of the suspected fault, we have traced it back as far as a map published in 1963 by the California Division of Mines and Geology, which was authored by Harold F. Weber. On that map it is clearly indicated that the subject fault is concealed beneath extensive Quaternary Terrace Deposits and alluvium in the Pala area, at the base of Palomar Mountain, to the east. In addition, in this earliest generation map, the fault terminates approximately 3 miles to the east of the subject project.

In 1965 the California Division of Mines and Geology published a geologic map titled "Geologic Map of California: Santa Ana sheet, which also contained a plot of this fault. On that map the fault has been extended to within approximately 2,500 feet of the subject project. We suspect this was a simple matter of inaccurate drafting of an insignificant, small, inactive fault when transferring it from one large scale map to another larger scale map. As plotted on the 1965 map, the fault passes through mapped contacts between granitic and gabroic rocks without any apparent displacement of these contacts. If this fault was intentionally extended to the west in 1965, it was likely based on an interpretation of a lineament observed from aerial photos. Such interpretations were common in the 1960's, which resulted in non-existent faults being plotted along the San Diego River Valley, Lyon's Valley, El Cajon Valley, etc. These inferred faults have since been demonstrated to only be lineaments within the Batholith, but yet they remain on many of the state maps. Considering the orientation of the subject fault, which is nearly perpendicular to the strike of the major fault systems in Southern California, in our opinion it is most likely a lineament rather than a fault, especially one associated with active faulting.

In summary, it is our opinion that there is not sufficient cause to warrant any further investigation of this mapped fault, since it is shown as being an inactive fault in the source data, and likely is simply a lineament, not related to faulting. Further, a projection of the mapped fault onto the project site would place it beneath Quaternary Terrace and alluvial materials of considerable thickness, which are shown to conceal the fault in areas where it is mapped to the east. Therefore, any field investigation searching for a fault would be futile since any faulted bedrock would be buried by thick deposits of terrace material and alluvium.

The nearest fault zones which are considered active are the Temecula and Julian segments of the Elsinore Fault. The main traces of these faults are located approximately 11.3 and 12.7 kilometers to the northeast.

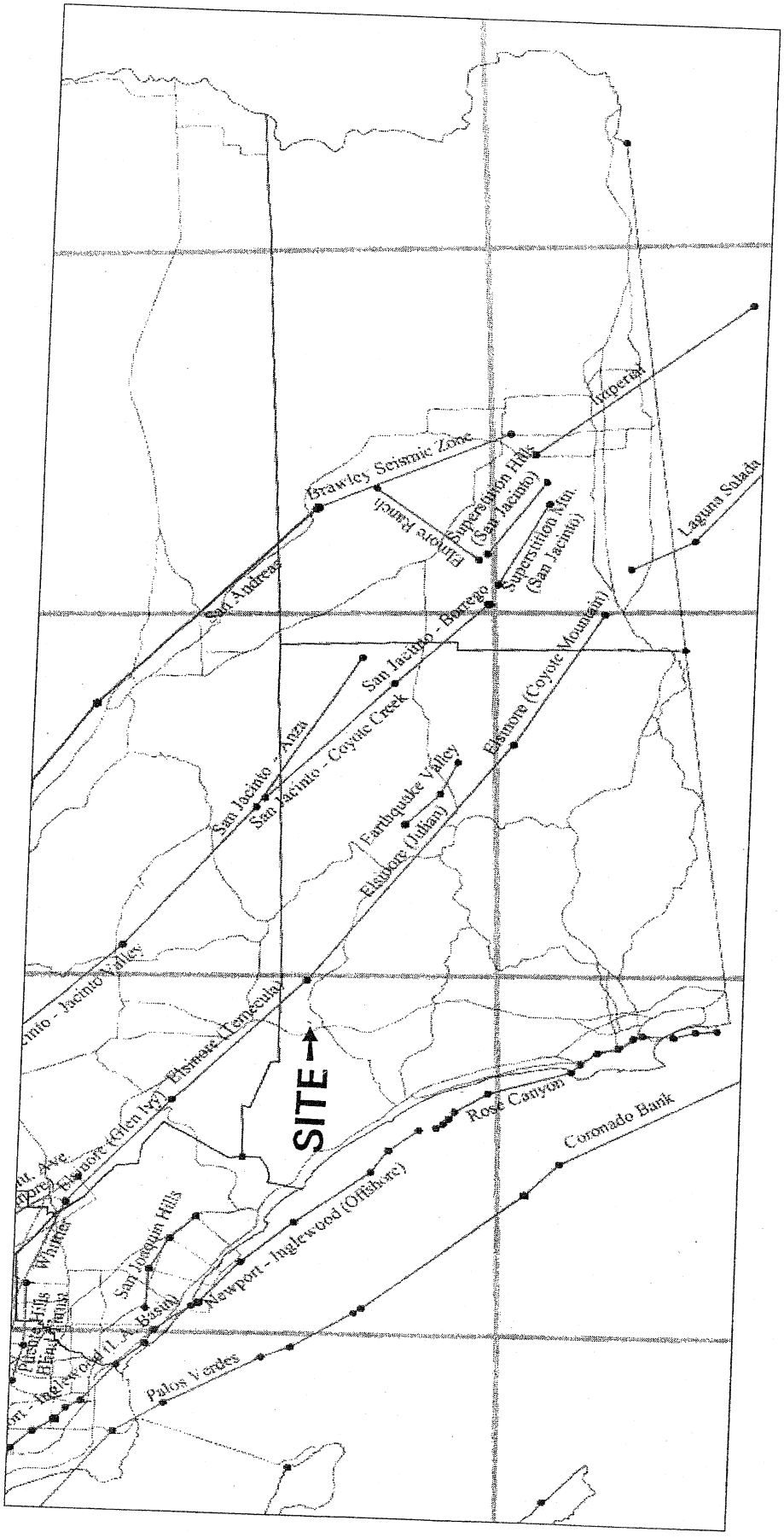
Other more distant faults which can affect the site through ground shaking include the Rose Canyon, Coronado Bank, San Jacinto-Anza, San Jacinto-San Jacinto Valley, and Earthquake Valley. These seismic sources are listed in Table No. 1, along with a description which includes the characteristics and the closest distance to the project site. A fault map showing the relative position of the fault zones to the site is presented on Figure 3.

TABLE NO. 1 - SEISMIC SOURCES SUMMARY

Source Name	Maximum Magnitude, M_W	Estimated Slip Rate mm/year	Peak Site Acceleration (g)	Estimated Closest Distance to Site* (km)
Elsinore-Temecula	6.8	5.0	0.22	11.3
Elsinore-Julian	7.1	5.0	0.23	13.7
Newport-Inglewood offshore	6.9	1.5	0.11	33.3
Rose Canyon	6.9	1.5	0.11	34.9
Elsinore-Glen Ivy	6.8	5.0	0.10	37.0
San Jacinto-Anza	7.2	12.0	0.1	47.6
San Jacinto-San Jacinto Valley	6.9	12.0	0.08	48.7
Earthquake Valley	6.5	2.0	0.06	56.7
Coronado Bank	7.4	3.0	0.08	60.8

* The distances shown in this table are measured from the site to the faults modeled as linear segments; these distances may be slightly different from the actual distances from the site to mapped faults.

FIGURE NO. 3



Fault map- Southern California

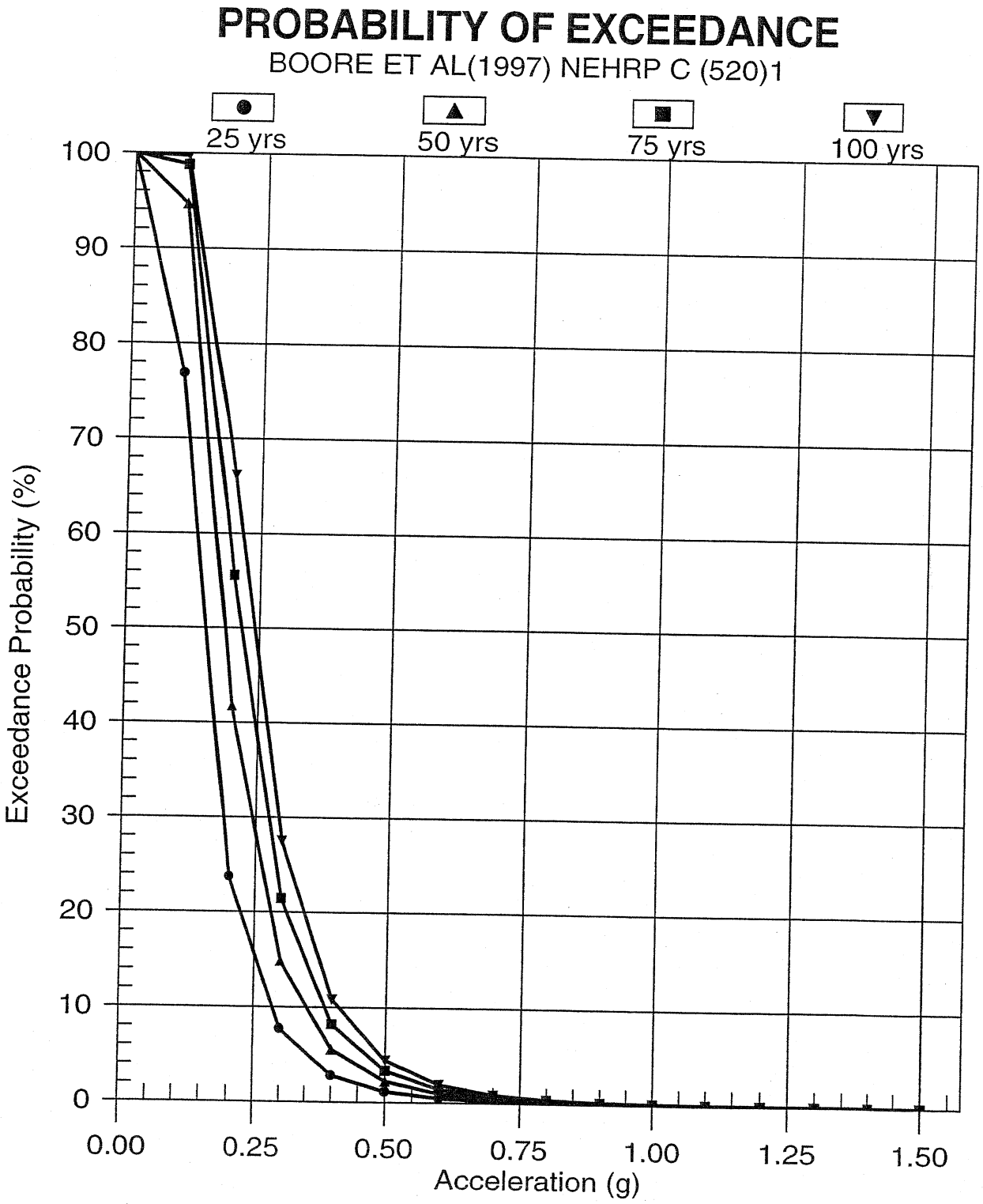
4.4 Site-Specific Analysis of Peak Ground Acceleration

Our analysis was performed for the maximum probable earthquake (MPE). The MPE is defined as having a 10% probability of being exceeded in a 50-year period, which equates to a return period of approximately 475 years. Our analysis used probabilistic procedures. The seismic hazard model used in this study is based on the model presented by McGuire (1978). The computer program FRISKSP Version 4.0, as prepared by Thomas F. Blake Computer Services and Software, was used in the calculations. The fault data files used in the program were adapted from the data compiled by California Geological Survey (CGS) and the U.S. Geological Survey (USGS).

Attenuation describes the variation of ground motion parameters with earthquake magnitudes and the source-to-site distance. Attenuation relationships are derived on the basis of statistical analysis of ground motions recorded during previous earthquakes. The most recent attenuation relationship developed by Boore, Joyner, and Fumal (1997), NEHRPD (520) was selected for use in this study.

The results of the probabilistic analysis of the peak ground accelerations are presented on Figure 4 on the following page. This figure illustrates the probability of exceedance of various levels of the peak ground acceleration for the 25, 50, 75, and 100 year periods. As seen from Figure 3, the peak ground acceleration for this site that is associated with a 10% probability of being exceeded in 50 years (MPE) is 0.35 g.

FIGURE NO. 4


PROBABILITY OF EXCEEDANCE
BOORE ET AL(1997) NEHRP C (520)1
25 yrs
50 yrs
75 yrs
100 yrs
Exceedance Probability (%)
100
90
80
70
60
50
40
30
20
10
0
0.00
0.25
0.50
0.75
1.00
1.25
1.50
Acceleration (g)

4.5 Liquefaction Potential

Liquefaction is a condition where, due to ground shaking, granular soil below the water table temporarily loses strength and behaves as a viscous fluid, rather than a solid. Relatively clean, clay-free deposits, are the most susceptible to liquefaction. Strong ground motion distorts the soil structure causing the voids between soil particles to collapse, resulting in an increase in the pore water pressure. The potential for liquefaction to occur is controlled by many factors, including water table depth, soil type, relative density of the soil, grain size of soil particles, the percentage of clay size fines, the intensity and duration of ground shaking and other factors. The state of practice for analyzing liquefaction is not exact and is continually being modified and expanded.

For this project we have utilized the evaluation procedures outlined by the NCEER (1997 method). The numerical computations were processed via computer program, LIQUEFY PRO (Civil Tech Corp 2000). The following parameters taken from the previous section of this report were used in our computations:

1) Design earthquake (MPE) movement magnitude: 6.9 MW
2) Peak ground acceleration: A_{max} = 0.35g.
3) Groundwater depth of 0 to 12 feet.
4) Standard penetration resistance blow counts presented on the Log of Test Boring.
5) Soil particle size - Laboratory tests indicate that the typical subsurface materials within the substrata have percentages passing the No. 200 sieve (clay and silt sizes) in the range of 8% to 55%.

The factor of safety against liquefaction is defined as the ratio of cyclic stress ratio needed to cause liquefaction versus the average earthquake induced cyclic stress ratio produced by a given earthquake and soil profile.

The younger alluvial deposits, which are mainly loose, granular and saturated, were found to have a factor of safety against liquefaction of less than 1.0 for most of their depth. The results of the calculations are presented in the Appendix. This liquefiable zone was found to extend to depths 20 feet to 35 feet over most of the alluvial area, delineated as Qal on Plate A1. The upper alluvium is underlain by an old alluvium that is denser and more consolidated. The older alluvium does not exhibit liquefaction characteristics.

4.8 Expansive Soil

Most soils within the project found in the upper levels of the final subgrade are granular and exhibit very low to low expansive characteristics. There may be some occasional occurrences of moderately expansive soil in the weathered residuum above the bedrock. Standard grading and foundation/slab designs are suitable for the project. Any moderately expansive soils that may be occasionally found can be attenuated by deep burial in the deeper fills at the site, or can be mitigated by design of stiffer slabs and foundations.

4.9 Settlement

Static settlement of the saturated younger alluvium materials is estimated to potentially produce large magnitudes of settlement under fill and/or structural loadings. This is in addition to the seismic settlement discussed in a previous section. The mitigation of the static settlement can occur with the ground densification procedures discussed for mitigating the liquefaction impacts. The details of the mitigation measure that may be most appropriate will come out of the final geotechnical investigation. Static settlement of the saturated alluvium area could also come about by implementing surcharge fills and time delays to allow dissipation of settlement. This time delay to accomplish 90% of the settlement would most likely involve several months, or more, if done without any other in-place ground modification. Where the alluvium is found above the groundwater level it is recommended it be removed and then replaced as compacted fill. Based on the exploration logs and laboratory data collected to date, the native soils in areas beyond the alluvium appear to have relatively low compressibility. To account for low density and higher compressibility in the near surface soil layers, it is recommended that these soils be recompacted to 90% relative compaction, or greater. The depth for removal/recompaction is estimated at 5 feet. The actual depth is to be determined during grading when the substrata is exposed.

4.10 Landslides

No previous landslides have been mapped or suspected in the area of the Passerelle project. Our field reconnaissance and review of aerial photographs and topographic maps of the northern hillsides of this project suggest that there may possibly have been a history of some debris flow occurrences in this area. We recommend that as a part of the detailed geotechnical investigation for this project that the possibility of existing debris flow deposits be investigated in the northern portion of the site. If such deposits exist, we expect that they could be mitigated with relatively minimal additional grading.

Allowable soil bearing pressure: 2500 lbs/sq. ft.
(may be increased 33% for wind or seismic loading)

Footing Embedment Depth: 12 inches and 18 inches below lowest adjacent finished soil grade for 1- and 2-story construction, respectively

Minimum Reinforcement: One No. 4 bar near top and one No. 4 bar near bottom

Footings for buildings, walls, fences, and landscaping that are constructed close to the top of a descending cut or fill slope are subjected to diminished support due to reduced lateral support of soils near the slope face. The base of foundations, including buildings, retaining walls, garden walls, fences, and other settlement-sensitive features, should be placed no closer than 8 feet horizontally from the nearest face of slope. If it is desired to place a footing closer than 8 feet, then the base of the footing should extend 12 inches below a depth that provides 8 feet of horizontal clearance from the base of the footing to the nearest slope face.

The above parameters will require modification where there is significant fill depth and /or differential fill thickness across a lot.

Preliminary Slabs-on-Grade Recommendations

Concrete slabs-on-grade may be supported on cuts in native materials, or on compacted fills when prepared as recommended in the previous sections of this report.

We recommend the concrete slabs-on-grade be no less than 4 inches in thickness and reinforced with No. 3 reinforcing bars, spaced at 18 inches each way, placed at mid-slab height. Chairs or other supporting devices should be used to maintain the reinforcement at the proper level during concrete placement.

To minimize the intrusion of moisture vapor into the interior of structures through the concrete slabs, we recommend that a moisture vapor barrier consisting of 10 mil., or thicker, PVC film, or equivalent, be placed below the slabs. The moisture vapor barrier should be overlain by clean, moist sand, no less than two inches in thickness. The sand blanket is intended to provide protection of the moisture barrier during the concrete slab placement, and to promote more uniform curing of the concrete slab. Furthermore, the membrane should be underlain by at least two inches of clean, coarse sand or fine gravel placed between the base of the membrane and the underlying subgrade.

Drive roadway may be required to address potential settlement that otherwise might adversely impact the pavement and infrastructures in the roadway. The other off-site roadway/intersection improvements will involve relatively minor grading and are therefore seen to have no significant impacts.

Detailed recommendations for the final grading, ground modification, building/roadway design, and other geotechnical related issues will be addressed in the final geotechnical investigation for the project.

REFERENCE LIST
CAMPUS PARK

S.E.A. 201171-04

1) *A Computer Program for the Empirical Prediction of Earthquake-Induced Liquefaction Potential*, User's Manual, version 1.5, 1998.

2) *County Report 3*, Mines and Mineral Resources of San Diego County, by Weber, F.N., CDMG, 1963

3) *EQFAULT, A Computer Program for the Estimation of Peak Horizontal Acceleration from 3-D Fault Sources*, 2000.

4) *Fault Activity Map of California and Adjacent Areas*, California Geological Survey formerly the California Division of Mines and Geology, by Jennings, C.W., 1994

5) *Geologic Map of California*, Division of Mines and Geology, Santa Ana Sheet, 1965

6) *Geology of the San Diego Metropolitan Area, California*, Bulletin 200, California Division of Mines and Geology, by Kennedy, M. P., 1975

7) *Geotechnical Assessment, Proposed Palomar Community College, North Education Center, Pala Road, San Diego County, California*, by Shepardson Engineering Associates, Inc., Feb. 26, 2007

8) *Geotechnical Due Diligence Study, Rottman/Pankey 1000± Acre Parcel, County of San Diego, CA,* prepared by Pacific Soils Engineering, Inc., August 15, 2000 (Work Order 400735)

9) *Geotechnical Feasibility Study, (Pankey Ranch), San Diego County, California*, prepared by Geocon, Inc., August 22, 2002

10) *Guidelines for Evaluating and Mitigating Seismic Hazards in California*, California Division of Mines and Geology (CDMG) Special Publication 117, adopted March 13, 1997.

11) *Preliminary Geotechnical Assessment, Proposed Passerelle Subdivision, Pala Road in San Diego County*, prepared by Shepardson Engineering Associates, Inc., October 30, 2003

12) *Preliminary Geotechnical Investigation, Hewlett-Packard Pala Mesa*, prepared by Woodward-Clyde Consultants, October 22, 1982

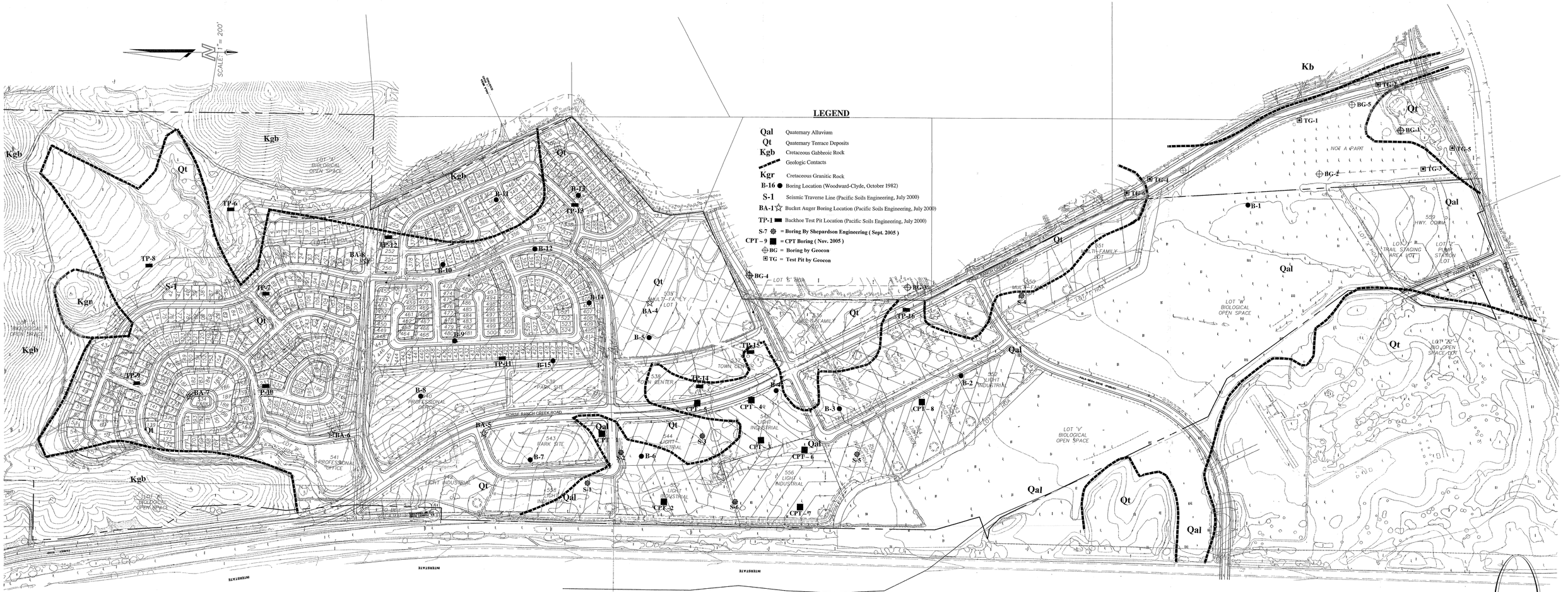
13) *Preliminary Geotechnical Assessment, Proposed Passerelle Subdivision, Pala Road, San Diego County, California*, by Shepardson Engineering Associates, Inc., Oct. 30, 2003

14) *Probabilistic Seismic Hazard Assessment for the State of California*, Open File Report 96-08, by California Department of Conservation, California Geological Survey, formerly the California Division of Mines and Geology, 1996

15) *Simplified Procedure for Evaluating Soil Liquefaction Potential*, Journal of the Soil Mechanics and Foundations Division, ASCE, Vol. 97, No. SM9, p. 1249 ff., by Seed, H.B. and I.M. Idriss, 1971

16) *Updated Geotechnical Assessment, Proposed Passerelle Subdivision, Pala Rd., TM 5338, San Diego County, California*, by Shepardson Engineering Associates, Inc., Oct. 4, 2006

GEOTECHNICAL ASSESSMENT SITE PLAN


SCALE: 1" = 200'
LEGEND
Qal Quaternary Alluvium
Qt Quaternary Terrace Deposits
Kgb Cretaceous Gabbroic Rock
Geologic Contacts
Kgr Cretaceous Granitic Rock
B-16 Boring Location (Woodward-Clyde, October 1982)
S-1 Seismic Traverse Line (Pacific Soils Engineering, July 2000)
BA-1 Bucket Auger Boring Location (Pacific Soils Engineering, July 2000)
TP-1 Backhoe Test Pit Location (Pacific Soils Engineering, July 2000)
S-7 = Boring By Shepardson Engineering (Sept. 2005)
CPT – 9 = CPT Boring (Nov. 2005)
BG = Boring by Geocon
TG = Test Pit by Geocon
LOT 'A' BIOLOGICAL OPEN SPACE
LOT 'B' BIOLOGICAL OPEN SPACE
LOT 'C' BIOLOGICAL OPEN SPACE
LOT 'V' BIOLOGICAL OPEN SPACE
LOT 'W' BIOLOGICAL OPEN SPACE
LOT 'Z' NO OPEN SPACE LOT
541 PROFESSIONAL OFFICE
542 LIGHT INDUSTRIAL
543 PARK SITE
544 LIGHT INDUSTRIAL
545 LIGHT INDUSTRIAL
546 LIGHT INDUSTRIAL
547 LIGHT INDUSTRIAL
548 LIGHT INDUSTRIAL
549 HWY. COMM.
550 MULTI-FAMILY LOT
551 MULTI-FAMILY LOT
552 MULTI-FAMILY LOT
553 MULTI-FAMILY LOT
554 MULTI-FAMILY LOT
555 MULTI-FAMILY LOT
556 LIGHT INDUSTRIAL
538 TOWN CENTER
539 PARK SITE
LOT 'X' TRAIL STAGING AREA
LOT 'Y' PUMP STATION LOT
NOT A PART
TO BE ABANDONED
INTERSTATE 5
INTERSTATE 805
SHEPARDSON ENGINEERING ASSOCIATES INC.
Geotechnical Consultants:
Engineers-Geologists
Date: April, 2007
Project No: 201171.04
Plate
SITE PLAN
Campus Park - TM 5338
San Diego County, California
A1
LANDMARK CONSULTING
PLANNING•ENGINEERING•SURVEYING
9550 GENESEE AVENUE, STE. 200
SAN DIEGO, CA 92121, 858.587.8070

GEOTECHNICAL UPDDATE ASSESSMENT LETTER

SHEPARDSON
ENGINEERING ASSOCIATES INC.

Geotechnical Consultants:
Engineers-Geologists

10035 Prospect Ave., Suite 101
Santee, CA 92071-4398
619 / 449-9830 FAX 619 / 449-5824

June 4, 2008

S.E.A. 201171-04

Passerelle, LLC
402 W. Broadway, Ste. 1320
San Diego, CA 92101-3542

ATTENTION: Mr. David Davis

SUBJECT: Update of Geotechnical Assessment
Report dated April 11, 2007
Proposed Campus Park
Pala Road
TM 5338-RPL 5
San Diego County, California

Gentlemen:

In accordance with your request, we have reviewed the current project design and proposed grading, as shown on County of San Diego Tract Map 5338 - RPL 5, and our prior Geotechnical Assessment Report, dated April 11, 2007, in order to determine if the discussions and recommendations contained in that report remain applicable to the current project design.

The current proposed plan for Tract 5338- RPL 5 appears to be very similar to that addressed in our April 11, 2007 report, with the exception that the new alignment of Pala Mesa Drive currently avoids crossing the flood plain on Horse Ranch Creek, and there is also the addition of a connecting road between Horse Ranch Creek Road and Pala Mesa Drive, near the southern end of the project. It appears that the realignment of Pala Mesa Drive would place the road almost entirely in Terrace Deposit materials and would avoid deep alluvial removal and recompaction, which would have been required by the prior alignment. The proposed connecting road between Horse Ranch Creek Road and Pala Mesa Drive will cross Horse Ranch Creek, but its location at the southern end of the project will avoid much of the heavily vegetated, riparian area, and will allow access for geotechnical testing along the proposed alignment without major disturbance to the existing vegetation and fauna. We anticipate that deep alluvial materials will underlie this proposed connecting road.

Based on our review, it is our opinion that our April 11, 2007 assessment remains applicable without further modification.

Please contact us with any questions regarding this report. We appreciate the opportunity to be of service.

Respectfully submitted,

SHEPARDSON ENGINEERING ASSOCIATES, INC.

Kendall L. Sherrod
Senior Engineering Geologist/Vice President

William E. Ellis, RCE/GE
Senior Geotechnical Engineer/Vice President

cc: (4) Addressee

PALEONTOLOGICAL RESOURCE ASSESSMENT

PALEONTOLOGICAL RESOURCE ASSESSMENT
CAMPUS PARK/PASSERELLE
DEVELOPMENT PROJECT
SAN DIEGO COUNTY, CALIFORNIA

COUNTY OF SAN DIEGO TRACT 5338 RPL-4

Prepared for:

PASSERELLE, LLC
402 West Broadway, Suite 2175
San Diego, CA 92101

Prepared by:

DEPARTMENT OF PALEOSERVICES
San Diego Natural History Museum
P.O. Box 121390
San Diego, CA 92112

Thomas A. Deméré, Ph.D.
Director
Paul C. Murphey, Ph.D.
Associate Director

3 August 2005

TECHNICAL REPORT
PALEONTOLOGICAL RESOURCE ASSESSMENT
CAMPUS PARK/PASSERELLE DEVELOPMENT PROJECT
CITY OF SAN DIEGO
SAN DIEGO COUNTY, CALIFORNIA

INTRODUCTION

Passerelle LLC proposes to develop the approximately 500 acre property in the Fallbrook area of northern San Diego County for residential, recreational and commercial/retail uses (County of San Diego Tract 5338 RPL-4). The property is situated to the east of Horse Ranch Creek, a south-flowing tributary of the San Luis Rey River, and includes the west flank of Monserate Mountain. The parcels are located to the northeast of the Interstate 15/State Route 76 Interchange and includes the southwestern corner of Section 25, T. 9 S., R. 3 W.; San Bernardino Meridian (Figure 1).

This technical report provides an assessment of issues related to paleontological resources within the project Area of Potential Effect (APE). The purpose of this report is to assist with planning and design efforts for the proposed project as related to paleontological resource issues. Specifically, this report is intended to summarize existing paleontological resource data in the project area and vicinity; assess potential impacts to paleontological resources from implementation of project construction; and identify mitigation measures to avoid or reduce project-related impacts wherever feasible. Additional discussion of report methodology is provided below. This report was prepared by Paul C. Murphey and Thomas A. Deméré of the Department of PaleoServices at the San Diego Natural History Museum, San Diego, California.

As defined here, paleontological resources (i.e., fossils) are the remains and/or traces of prehistoric plant and animal life exclusive of humans. Fossil remains such as bones, teeth, shells, leaves, and wood are found in the geologic deposits (rock formations) within which they were originally buried. For the purposes of this report, paleontological resources can be thought of as including not only the actual fossil remains but also the collecting localities and the geologic formations containing those localities.

METHODOLOGY

A review was conducted of relevant published geologic reports (Jahns, 1954; Rogers, 1963; Weber, 1963), unpublished paleontological reports (Deméré and Walsh, 1993), and

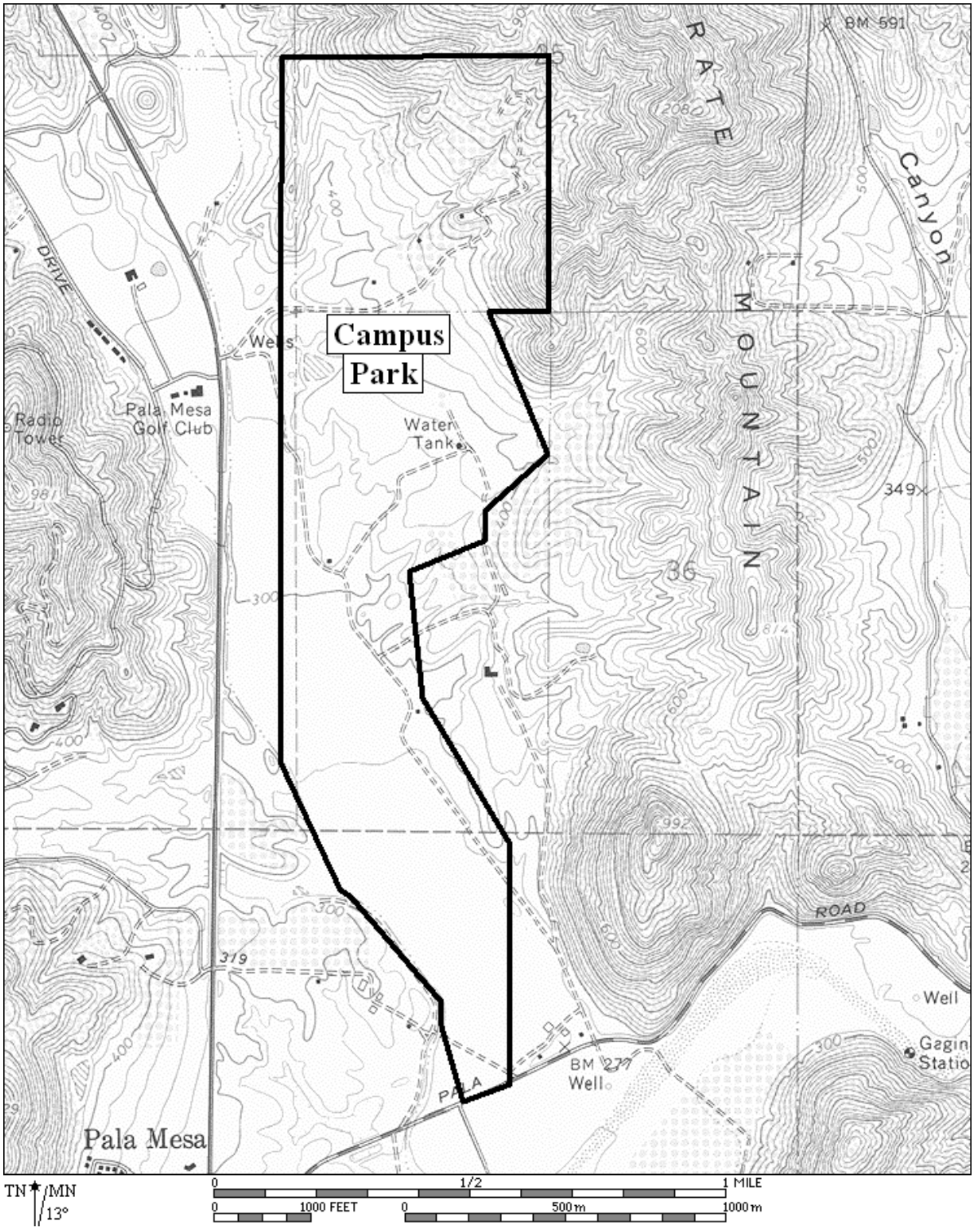


Figure 1. Map showing location of the Campus Park/Passerelle property in San Diego County, CA. Base map: Bonsall CA 7.5' USGS topographic quadrangle.

museum paleontological site records (Department of Paleontology, San Diego Natural History Museum). This approach was followed in recognition of the direct relationship between paleontological resources and the geologic formations within which they are entombed. Knowing the geology of a particular area and the fossil productivity of particular formations that occur in that area, it is possible to predict where fossils will, or will not, be encountered.

On Friday, July 1, 2005, Paul C. Murphey and Maureen O. Walsh of the San Diego Natural History Museum conducted a walkover survey of the Campus Park/Passerelle property to determine the paleontological sensitivity of the geologic units that will be affected by the proposed development. This field work involved inspection of the site for bedrock outcrops, geologic contacts, and presence or absence of paleontological resources (i.e., fossils).

EXISTING CONDITIONS

PHYSICAL GEOLOGICAL SETTING

According to Rogers (1963), geologic units underlying the project site include Mesozoic basic intrusive rocks, Mesozoic granidiorite and Quaternary alluvium. Weber (1963) identifies Mesozoic-aged basement rocks within the project site as gabbroic, granitic, and granitic with gneissic texture. Tan et al. (2000) mapped the project site as containing Quaternary alluvium, Quaternary older alluvium, granidiorite, and gabbro (Figure 2). These maps are in general agreement with the geotechnical due diligence study conducted for the Campus Park/Passerelle property (Pacific Soils Engineering, 2000). The intrusive igneous rock units are unfossiliferous and thus have no paleontological sensitivity. The geotechnical report (Pacific Soils Engineering, 2000) notes that artificial fill exists in limited quantities over the site, and that these fill deposits were derived from ranch and farming operations. Artificial fill is unfossiliferous and hence has no paleontological sensitivity. Late Quaternary (Holocene) alluvium occurs in the modern stream drainage and adjacent floodplain of Horse Ranch Creek on the western edge of the Campus Park parcel. Although Holocene alluvial deposits do contain animal bones, they are the unfossilized remains of modern species, and are considered to have low paleontological sensitivity in San Diego County (Deméré and Walsh, 1993). Quaternary river terrace deposits and alluvial fan deposits form much of the gently sloping portion of the site to the east of the modern unnamed stream drainage and west of the mountain flank. Formed at times of higher (and older) stream base levels than exist today, the river terrace deposits are of probable late Pleistocene age. Unnamed river terrace deposits of Pleistocene age are known to locally contain the fossilized remains of animals and plants, and are considered to have moderate paleontological sensitivity in San Diego County (Deméré and Walsh, 1993).

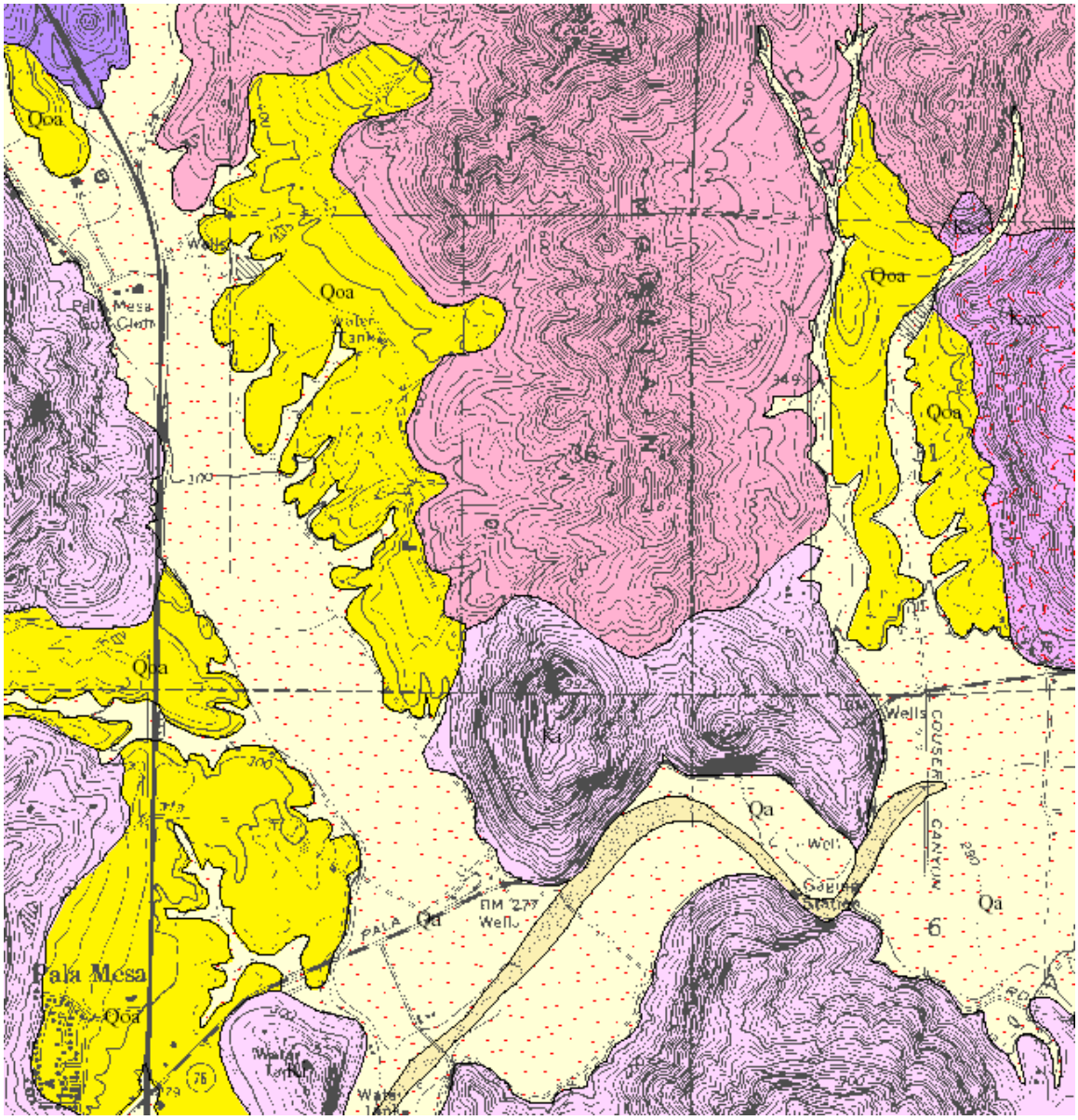


Figure 2. Geologic map of the study area vicinity (from Tan et al., 2000). Qa = Quaternary Alluvium; Qoa = Quaternary older alluvium (referred to in this report as Quaternary river terrace deposits). Other mapped rock units have no paleontological sensitivity.

PALEONTOLOGICAL RESOURCE ASSESSMENT

There are no recorded fossil collecting localities within the Campus Park/Passerelle parcels. Fossils have been discovered and recovered, however, from a number of Pleistocene-aged river terrace deposits within and adjacent to the modern San Luis Rey River drainage to the west in Oceanside. These fossils represent a diverse assemblage

including mammoth, mastodon, camel, horse, tapir, and rodents including capybara. In addition, the records of the Natural History Museum of Los Angeles County (LACM) document a fossil occurrence located several miles to the east of the Campus Park/Passerelle property on the north side of the San Luis Rey River Valley. This locality, LACM (CIT) 599, produced a single tooth of a fossil horse (*Equus* sp.). Unfortunately, the specimen is described only as being "from Pala," so the precise location of the locality which produced it is unknown (McLeod, 2005).

In general, Pleistocene-aged river terrace deposits are known to contain scientifically significant fossils of varying abundance, taxonomic diversity, and scientific significance. These fossils include extinct "Ice-Age" mammals including mammoth, mastodon, ground sloth, dire wolf, short-faced bear, saber-toothed cat, large and small horses, antelope, large and small camels, and bison (Eisentraut and Cooper, 2002; Pajak et al., 1996; Scott, 2004). Fossil invertebrates and plant remains have also been recovered from alluvial units of Pleistocene age. The discovery and recovery of fossils from these deposits elsewhere along the drainage of the San Luis Rey River indicates the potential for fossil occurrences within the Quaternary river terrace deposits underlying the Campus Park/Passerelle property. The following discussion summarizes the known paleontological sensitivity of late Quaternary alluvium and Quaternary river terrace deposits in San Diego County.

Late Quaternary (Holocene) Alluvium

Flooring the modern river drainages of San Diego County are poorly consolidated alluvial sediments of relatively recent age (i.e., generally younger than 10,000 years old). Lithologies consist of poorly consolidated clay, silt, sand, and gravel. Coarser lithologies generally occur in the mountain valleys of the Peninsular Ranges. In general, these deposits were laid down by the ephemeral streams that seasonally occupy these drainages today.

Paleontology. Fossils are generally unknown from late Quaternary alluvium, although there are notable exceptions. Teeth and limb bones of a mammoth were found in floodplain deposits of the Tijuana River Valley, a single mammoth tusk was found in alluvial deposits in the southwestern portion of El Cajon Valley, and a mammoth femur was recovered from late Quaternary alluvium in the Santa Margarita River channel at the south end of the Camp Pendleton Marine Corps Base. Peat deposits in Pine Valley contain subfossil pine cones and insects (R. A. Cerutti, pers. comm.), and subfossil pine cones have also been found by well-drillers in the alluvium of Campo Valley. Because of its relatively young age, late Quaternary alluvium in San Diego County was assigned a low paleontological resource sensitivity (Demeré and Walsh, 1993).

Quaternary River Terrace Deposits

Deposits of coarse-grained, gravelly sandstone, pebble and cobble conglomerate, and claystone occur along the margins of many of the larger coastal and mountain valleys. These deposits generally occur at levels above the active stream channels and represent the sediments of ancient river courses. The exact age of these deposits is presently uncertain, but they are clearly related to late Pleistocene (10,000 to 500,000 years old) climatic events.

Paleontology. In addition to the discoveries made in Oceanside and Pala discussed above, fossils have been collected from Quaternary river terrace deposits at a number of locations in San Diego County. These locations include the south side of Sweetwater Valley, where fluvial sandstones and siltstones have produced well-preserved remains of pond turtle, passenger pigeon, hawk, mole, gopher, squirrel, rabbit, and horse (Chandler 1982; Jefferson 1991; Majors 1993); the South Bay Freeway (State Route 54), where fluvial siltstones have yielded a diverse assemblage of "Ice Age" mammals (ground sloth, shrew, mole, mice, wolf, camel, deer, horse, mastodon, and mammoth); and San Dieguito Valley, where fluvial sandstones have produced well-preserved remains of ground sloth. All of these important sites have been discovered in construction-related excavations. Jahns (1954) reported the occurrence of scattered vertebrate remains of late Pleistocene age in the "Pala Conglomerate" deposits east of the Campus Park/Passerelle property. Unfortunately, he did not indicate the nature of these remains or in what university or museum collections the fossils were deposited. Subsequent field work has failed to turn up any new fossil discoveries in these deposits. The reasons for poor fossil recovery, however, are primarily related to poor bedrock exposures and insufficient prospecting. It is felt that increased attention to these older alluvial deposits and/or new exposures created by excavation projects will turn up additional fossil material. The general coarse-grained nature of these deposits coupled with the rarity of known fossil occurrences might suggest a low paleontological resource sensitivity. However, the fact that important vertebrate remains have been collected from several sites indicates that potentially significant sites may be encountered elsewhere, and thus a moderate resource sensitivity was assigned (Deméré and Walsh, 1993).

Site Specific Assessment

As discussed above, although no fossil localities have been previously recorded from within the Campus Park/Passerelle property, fossils have been reported from Quaternary river terrace deposits of Pleistocene age at numerous locations within San Diego County and elsewhere in southern California. These include poorly documented occurrences in the Pala area just to the east, and well documented occurrences along the San Luis Rey River drainage further to the west in Oceanside.

No fossils were observed within the project APE during the field survey. The Campus Park/Passerelle property has relatively low topographic relief and includes the modern stream drainage and adjacent floodplain of Horse Ranch Creek in much of its southern portion, and older river terrace deposits which are locally overlain by alluvial fan deposits in much of its northern portion.

The slopes of Monserate Mountain are heavily vegetated and largely covered with colluvium and slopewash, although outcrops of granitic rock are locally visible. At the base of Monserate Mountain, moderately well-developed alluvial fans of probable Holocene age have prograded into the north-south trending valley of Horse Ranch Creek. Profiles of the alluvial fan sediments are locally visible on the sidewalls of several gullies within the project site. In the north-central portion of the Campus Paerk property, approximately 8 feet of alluvial fan sediments were exposed in a small stream drainage, and the stream bed was composed of solid granite (UTM 11S, 485531 mE, 3691166 mN). In other gullies that were inspected further to the south, in-situ basement rock was not visible. Lithologically, observed alluvial fan sediments consisted of reddish-brown to dark brown silty sandstone containing locally abundant angular to subrounded granitic gravel to boulder-sized fragments of granitic rock. These deposits are matrix supported, and thin rapidly to the west. Based on field observations and the results of the geotechnical report (Pacific Soils Engineering, 2000), the thickness of the surficial alluvial sediments and the depth of basement rock within the project site are highly variable.

In one gully near the center of the project APE, the alluvial fan deposits are directly underlain by a Quaternary river terrace deposit which is approximately 30 feet above the modern stream drainage to the west (Figure 3). Lithologically, this alluvium consists of locally bioturbated moderately well-indurated light greenish-gray and pink calcareous muddy sandstone containing small amounts of granule to pebble gravel. It occurs 8 feet below the surface at UTM 11S 0486062 mE, 3690425 mN (Figure 3), and only 1 foot beneath the surface at UTM 11S 0485959 mE, 3690380 mN approximately 300 feet to the west within the same gully. Construction excavations which disturb this unit have the potential to adversely impact scientifically significant fossils. Although its distribution is uncertain because it is mostly buried by younger sediments, it is likely that this older river

Figure 3. Looking northwest at exposure of older river terrace alluvium (lower left) consisting of light greenish-gray and pink muddy sandstone. It underlies reddish-brown Holocene alluvial fan deposits within an east-west trending gully on the project site (UTM 11S, 486062 mE, 3690425 mN).

terrace alluvium underlies gently sloping portions of the project site that are east of the modern stream drainage and its adjacent floodplain, and west of the lowest slopes of Monserate Mountain.

IMPACT ANALYSIS

INTRODUCTION

Direct impacts to paleontological resources occur when earthwork activities, such as mass grading operations, cut into the geological deposits (formations) within which fossils are buried. These direct impacts are in the form of physical destruction of fossil remains. Since fossils are the remains of prehistoric animal and plant life they are considered to be nonrenewable resources. Such impacts can be significant and, under CEQA guidelines, require mitigation.

Impacts to paleontological resources are rated in this report from high to low depending upon the resource sensitivity of impacted formations. The specific criteria applied for each sensitivity category are summarized below.

High significance
Impacts to high sensitivity formations.

Moderate significance
Impacts to moderate sensitivity formations (Quaternary river terrace deposits).

Low significance
Impacts to low sensitivity formations (late Quaternary alluvium).

SITE SPECIFIC IMPACTS

Quaternary river terrace deposits

Although no fossils were observed during the walkover survey, it is possible that grading of the project site may impact paleontological resources preserved within the river terrace deposits underlying portions of the project site. Based on the survey results, even shallow excavations and minor grading activities could adversely impact paleontological resources. These potential impacts can be mitigated using the mitigation measures listed below.

MITIGATION MEASURES

It is recommended that the following mitigation measures be taken in order to reduce potential adverse impacts on paleontological resources to below the level of significance.

1. A qualified paleontologist should be at the pre-construction meeting to consult with the grading and excavation contractors concerning excavation schedules, paleontological field techniques, and safety issues. A qualified paleontologist is defined as an individual with a MS or Ph.D. in paleontology or geology who is familiar with paleontological procedures and techniques, who is knowledgeable in the geology and paleontology of San Diego County, and who has worked as a paleontological mitigation project supervisor in the county for at least one year.

2. A paleontological monitor should be on-site on a full-time basis during the original cutting of previously undisturbed deposits of moderate paleontological resource sensitivity (Quaternary river terrace deposits) to inspect exposures for contained fossils. A paleontological monitor is defined as an individual who has experience in the

collection and salvage of fossil materials. The paleontological monitor should work under the direction of a qualified paleontologist. If the qualified paleontologist or paleontological monitor ascertains that the river terrace deposits are not fossil-bearing, the qualified paleontologist should have the authority to terminate the monitoring program.

3. When fossils are discovered, the qualified paleontologist (or paleontological monitor) should recover them. In most cases this fossil salvage can be completed in a short period of time. However, some fossil specimens (such as a complete large mammal skeleton) may require an extended salvage period. In these instances the paleontologist (or paleontological monitor) should be allowed to temporarily direct, divert, or halt grading to allow recovery of fossil remains in a timely manner. Because of the potential for the recovering of small fossil remains, such as isolated mammal teeth, it may be necessary to set up a screen-washing operation on the site.

4. If any sub-surface bones or other potential fossils are found anywhere within the project site by construction personnel in the absence of the qualified paleontologist or paleontological monitor, the qualified paleontologist should be notified immediately to assess their significance and make further recommendations.

5. Fossil remains collected during monitoring and salvage should be cleaned, repaired, sorted, and cataloged as part of the mitigation program.

6. Prepared fossils, along with copies of all pertinent field notes, photos, and maps, should be deposited (as a donation) in a scientific institution with permanent paleontological collections such as the San Diego Natural History Museum. Donation of the fossils should be accompanied by financial support for initial specimen storage.

7. A final summary report should be completed that outlines the results of the mitigation program. This report should include discussions of the methods used, stratigraphic section(s) exposed, fossils collected, and significance of recovered fossils.

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