TERRA GEOSCIENCES

GEOLOGIC / FAULT INVESTIGATION

TENTATIVE PARCEL MAP NO. 30522

WILDOMAR, RIVERSIDE COUNTY, CALIFORNIA

Project No 272187-1

January 29, 2007

Prepared for:

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Attention: Mr. Joe Lacko

Regarding: Geologic / Fault Investigation
Tentative Parcel Map No. 30522
Wildomar, Riverside County, California

INTRODUCTION

As you know, a suspected fault is mapped that traverses through the subject property that may be associated with the Elsinore Fault Zone, however, the property does not lie within the designated boundaries of a State of California Alquist-Priolo Earthquake Fault Zone but does lie within a Riverside County Fault Hazard Zone. The purpose for this hazard zone is to regulate development near active faults so as mitigate the hazard of surface fault rupture. The intent of this investigation was to identify if any active faults traverse the subject property and to evaluate the local geologic conditions and seismic hazards that may impact the proposed development.

We understand the site will be utilized for commercial development. A Geologic Site Map has been prepared, as presented on Plate 1, which is a partial reduced copy of the 40-scale Tentative Parcel Map No. 30522, prepared by Land Development Design Corporation, Ontario, California, dated August 5, 2005. Several site photographs have been provided within Appendix B for reference and visual purposes. The scope of services provided for this evaluation included the following:

- **Review of available published and unpublished geologic/seismic data in our files pertinent to the site, including photogeologic analysis of stereo pairs of aerial photographs obtained from the Riverside County Flood Control District.**
- **Field mapping by a Certified Engineering Geologist, including stratigraphic logging of 765-feet of exploratory trench, up to eight-feet in depth.**
- **Evaluation of the local and regional tectonic setting and historical seismic activity, including performing a CBC geoseismic summary.**
- **Preparation of this report, presenting our findings, conclusions, and recommendations from a geologic standpoint, with respect to the proposed development.**

Accompanying Maps, Illustrations, and Appendices

Figure 1 - Regional Geologic Map
Figure 2 - Fault Hazard Zone Map
Figure 3 - Earthquake Epicenter Map
Figure 4 - Microseismicity Map
Plate 1 - Geologic Site Map
Appendix A - Exploratory Trench Log
Appendix B - Site Photographs
Appendix C - References

GEOLOGIC SETTING

The subject site is situated within a natural geomorphic province in southwestern California known as the Peninsular Ranges, which is characterized by steep, elongated ranges and valleys that trend northwesterly. This province is believed to have begun as a thick accumulation of predominantly marine sedimentary and volcanic rocks during the late Paleozoic and early Mesozoic (pre-batholithic rocks). Following this accumulation, in mid-Cretaceous time, the province underwent a pronounced episode of mountain building. The accumulated rocks were then complexly metamorphosed and intruded by igneous rocks, known locally as the Southern California Batholith. A period of erosion followed the mountain building, and during the late Cretaceous and Cenozoic time, sedimentary and subordinate volcanic rocks were deposited upon the eroded surfaces of the batholithic and pre-batholithic rocks (post-batholithic rocks). Most of these post-batholithic rocks occur along the western and northern potion of the province.

More specifically, the site is situated along the southwestern most portion of the Perris Block, which is an eroded mass of Cretaceous and older crystalline rock. Thin sedimentary and volcanic units mantle the bedrock in a few places with alluvial deposits filling in the lower valley areas. The Perris Block, approximately 20 miles by 50 miles in extent, is bounded by the San Jacinto Fault Zone to the northeast, the Elsinore Fault Zone to the southwest, the Cucamonga Fault Zone to the northwest, and to the southeast by the fringes of the Temecula basin, where the boundary is ill-defined. The Perris Block has had a complex history, apparently undergoing relative vertical land movements of several thousand feet in response to movement on the Elsinore and San Jacinto Fault Zones. These movements of the geologic past, in conjunction with the semi-arid climate and the weathering resistance of the rock, are responsible for the formation and preservation of ancient, generally flat-lying erosion surfaces now present at various elevations that give this region its unique geologic character.

As shown on the Regional Geologic Map that is presented on Figure 1, geologic mapping by Morton and Weber (2003), indicate the site to be predominantly underlain by Holocene and late Pleistocene age young alluvial-fan deposits of fluvial origin (map symbol Qyf), generally comprised of unconsolidated arenaceous (very fine- through very coarse grained) sand, gravel, and silt. Unfortunately, the southern portion of the site extends beyond the limits of the mapped U.S.G.S. Elsinore 7½-Minute Quadrangle and there is no published geologic map for the adjoining Wildomar 7½-Minute Quadrangle, of which is depicted on Figure 1.

GROUNDWATER

The site lies within the Elsinore Groundwater Basin which is bounded on the southwest by the Santa Ana Mountains, the Temecula Valley Groundwater Basin on the southeast at a low surface drainage divide, the northwest by the Temescal Subbasin of the Upper Santa Ana River Valley and on the northeast by nonwater-bearing rocks of the Peninsular Ranges along the Glen Ivy fault. No indications of shallow groundwater (i.e., seeps, springs, etc.) were noted during our literature research, field reconnaissance, or local subsurface exploration. Based on local data prepared by the (DWR, 1971) data from a well located approximately 1,500±-feet to the south (State Well No. 6S/4W-26-E1), indicates that water has been as shallow as 47±-feet in 1954. Groundwater is therefore expected at a depth of 50±-feet in the vicinity of the site.

FAULTING

There are at least forty-one major "potentially active/active" (late Quaternary) faults that are within a 100-kilometer (62-mile) radius of the subject site. Of these, there are no active faults known to traverse the site based on published literature, photogeologic analysis, field reconnaissance, and our subsurface exploratory trenching as discussed further in this report. In addition, the site is not located within a State of California "Alquist-Priolo Earthquake Fault Zone" for fault rupture hazard (C.D.M.G., 1980). The nearest known "active" fault is the Wildomar Fault (Temecula Segment of the Elsinore Fault Zone), of which the nearest mapped Earthquake Fault Zone is located approximately one-mile to the southwest. The Wildomar Fault is a right-lateral, strike-slip fault, being approximately 43-kilometers in length, with an associated slip-rate of 5.0 ±2.0 mm/year (C.D.M.G., 1996) and Cao, et al. (2003).

Although not zoned by the State of California, geologic mapping by Morton and Weber (see Figure 1) indicates that a branch of the Elsinore Fault Zone (Glen Ivy segment) is believed to just extend into the southwestern portion of the site. This fault is locally included within a seismic hazard zone as delineated by the County of Riverside as shown on Figure 2. This postulated fault is the basis for the subsurface exploratory trenching that was performed across the site as described further in this report.

CBC SEISMIC SUMMARY

Based on the geologic and seismic setting of the proposed residential subdivision, the following summary has been prepared to aid the project structural engineer in selecting the appropriate California Building Code (CBC) seismic design coefficients and factors, if applicable, from Chapter 16 of the 2001 California Building Code (Tables 16A-Q, 16A-R, 16A-S, and 16A-T).

- The subject site is located within Seismic Zone 4 (Table 16A-I).
- The nearest type "A" fault is the San Jacinto Fault (Anza segment) located approximately 35-kilometers to the northeast, having a maximum moment magnitude (M_w) of 7.2 and an estimated slip rate of 12.0 mm/year (Table 16A-U).
- The nearest type "B" fault is the Wildomar Fault (Temecula segment of the Elsinore Fault Zone), located approximately 1½-kilometers to the southwest, having a maximum moment magnitude (M_w) of 6.8 and an estimated slip rate of 5.0 mm/year (Table 16A-U).
- Since no shear-wave data or subsurface exploratory borings to 100-feet in depth was performed at the site, Soil Profile Type S_D (Table 16A-J) should be used for design purposes, which has an associated shear-wave velocity of 180 to 360 meters/second.

The maximum moment (M_w) earthquake is the maximum earthquake that is specific to that source, based on estimated rupture dimensions for that segment of the design fault. Values for the maximum moment magnitude earthquake have been determined by the California Division of Mines and Geology (1996), as outlined on their list of California Fault Parameters and as modified by Cao, et al. (2003).

HISTORIC SEISMIC ACTIVITY

A computerized search, based on Southern California historical earthquake catalogs, has been performed using the programs EQSEARCH (Blake, 1989-2000b) and EPI (Reeder, 1997). The following table and discussion summarizes the known historic seismic events (≥M4.0) that have been estimated and/or recorded during this time period of 1800 to January 2007, within a 100-kilometer (62-mile) radius of the site.

TABLE 1 - HISTORIC SEISMIC EVENTS; 1800-2007 (100-Kilometer Radius)

Richter Magnitude	No. of Events
4.0 - 4.9	599
5.0 - 5.9	63
6.0 - 6.9	18
7.0 - 7.9	0
8.0+	0

It should be noted that pre-instrumental seismic events (generally before 1932) have been estimated from isoseismal maps (Toppozada, et al., 1981 and 1982). These data have been compiled generally based on the reported intensities throughout the region, thus focusing in on the most likely epicentral location. Instrumentation beyond 1932 has greatly increased the accuracy of locating earthquake epicenters.

A summary of the historic earthquake data is as follows:

- At least 81 significant historical earthquakes of magnitude 5.0 and greater have been estimated and/or recorded during the period of 1800 to January 2007, within a 62-mile (100-kilometer) radius of the site.
- The closest notable earthquake (M4.0+) is located approximately nine-miles to the northeast, being a M4.1 event that occurred on April 27, 1962.
- The largest estimated historical earthquake magnitude (pre-1932) within a 62-mile radius is the M6.9 event of December 8, 1812 (approximately 56-miles northwest).
- The largest recorded historical earthquake was the M6.7 (M_w6.4) Big Bear event, located approximately 47-miles to the northeast (June 28, 1992).
- The nearest estimated significant earthquake epicenter (pre-1932) was located approximately eight-miles to the northwest, being a M6.0 event (May 15, 1910).
- The nearest recorded significant historic earthquake epicenter was approximately 15-miles northwest of the site (May 31, 1938, M5.5).

An Earthquake Epicenter Map which includes magnitudes 4.0 and greater for a 100-kilometer radius, and a Microseismicity Map which includes magnitudes 0.0 and greater for a 10-mile radius, have been included as Figures 3 and 4, respectively, for reference purposes. These maps were prepared using the computer program EPI (Reeder, 1997), based on the Caltech fault and earthquake epicenter database of instrumentally recorded events from the period of 1932 to January 2007.

SECONDARY SEISMIC HAZARDS

Secondary permanent or transient seismic hazards generally associated with severe ground shaking during an earthquake are ground rupture, seiches or tsunamis, seismically-induced settlement, liquefaction, flooding (water storage facility failure), landsliding, and rockfalls. These are discussed below.

Ground Rupture:

Ground rupture is generally considered most likely to occur along pre-existing faults. Since there are no faults that are known to traverse the site or observed within our exploratory trenching as discussed further in this report, the potential for ground rupture is considered to be low.

Seiches/Tsunamis:

Based on the far distance of large, open bodies of water and the elevation of the subject site with respect to sea level and Lake Elsinore, the possibility of seiches/tsunamis impacting the site is considered nil.

Seismically-Induced Settlement:

Seismically-induced settlement generally occurs within areas of loose granular soils. Since the subject site appears to be underlain dense to very dense older alluvial sediments, the potential for seismically-induced settlement appears to be low.

Liquefaction:

In general, liquefaction is a phenomenon that occurs where there is a loss of strength or stiffness in the soils that can result in the settlement of buildings, ground failures, or other related hazards. The main factors contributing to this phenomenon are: 1) cohesionless, granular soils having relatively low densities (usually of Holocene age); 2) shallow groundwater (generally less than 50 feet); and 3) moderate-high seismic ground shaking. Since the subject site is underlain by semi-consolidated late Pleistocene age alluvial deposits and the depth to groundwater is believed to be no shallower than 50±-feet in depth, the potential for liquefaction to occur at the site appears to low. In addition, the Riverside County Land Information System (Liquefaction Map, 2007) shows the site to be located within a zone of moderate liquefaction susceptibility.

Flooding (Water Storage Facility Failure):

Since no water storage facility (i.e. water tank, dam, etc.) is located above the site, the potential for flooding, caused by water storage facility failure, is considered nil.

Landsliding:

Due to the low-lying relief of the site and the absence of previously identified landslides, landsliding due to seismic shaking is considered nil.

Rockfalls:

Since no large rock outcrops are present at or adjacent to the site, the possibility of rockfalls during seismic shaking is nil.

SUMMARY OF FAULT INVESTIGATION

1. Photogeologic Analysis

A detailed examination of stereo pairs of aerial photographs was utilized to assess the local and regional geologic and geomorphic characteristics with respect to the site. Four relevant sets of aerial photographs were examined from the years of 1938 to 1990, at different scales (see References in Appendix C for a listing). Within all of the photographs reviewed, the site is a vacant open field with no structural improvements and may have been used for agricultural purposes. Based upon our photogeologic review, the suspected fault that is mapped by Morton and Weber (see Figures 1 and 2) was not noted in any of the referenced photographs, nor were there any photolineations that were suggestive of faulting observed within the site.

2. Field Reconnaissance

Surficial reconnaissance performed during our field investigation did not provide any geomorphic or visual indications suggestive of fault-related features. The site consists of low-lying rolling hills, and is covered by a sparse growth of annual weeds and grasses.

3. Subsurface Trenching

A total of 765 feet of lineal trench was excavated and logged to a depth of 8±-feet. This depth was deemed appropriate due to the late Pleistocene age of the underlying sediments wherein active faulting would have to displace or break the exposed earth materials. This trench was excavated in a northeast-southwest direction, generally being near normal to the suspected fault trend (northwest-southeast direction). The excavation provided a continuous exposure across the entirety of the subject site included in the Fault Hazard Zone, which provided satisfactory cover for the mapped fault trace. A generalized summary of the earth materials encountered locally is described below.

The exposed sediments within the exploratory excavation revealed uniform lithologic characteristics across the investigated area, with two distinct and continuous underlying stratigraphic locally overlain by thin topsoil and alluvial deposits. Mantling the higher portion of the site is clayey silty sand topsoil (Unit "A") which consists of an argillic soil horizon with a distinct prismatic structure that is for the most part between 18- to 24-inches in thickness. Directly underlying the topsoil is a fine- to coarse-grained clayey silty sand (Unit "B") that has a slightly blocky soil structure, is well-consolidated, and has moderate amounts of disseminated carbonate as stringers and blebs. This unit does not appear to extend below a depth of 5±-feet where locally explored.

Underlying this sediment layer to the depths explored and extending across the entire trench length is a massive fine- to coarse-grained silty sand (Unit "C") that is well-consolidated and contains occasional clean sand lenses. Numerous thin discontinuous and randomly oriented caliche filled fractures were encountered within both Units "B" and "C." Surficially encountered within the relatively low-lying southern-half of the trench is a thin Holocene age silty sand colluvial unit (Unit "D") comprised of a slightly dense fine- to coarse-grained massive silty sand.

A detailed graphic geologic log has been prepared (see Appendix A) at a scale of one inch equals ten-feet horizontally and five-feet vertically that depicts the conditions and structure of the earth materials encountered locally. This scale was deemed appropriate for this project due to the uniform and continuous lithologic features exposed along the trench walls. The southeastern trench side-wall was continuously logged for this study. Numerous representative trench photographs are provided in Appendix B for visual and reference purposes.

4. ***Relative Age Dating***

The underlying sediments appear to be late Pleistocene in age due to their indurated nature, inclusion of disseminated carbonate, soil development, and the presence of clay films along ped faces. No detrital carbon was found within any of the sediments during our cleaning and logging of the trench walls that could be used for absolute age-dating purposes. The thin overlying sediments along the southerly portion of the trench excavation (Unit "D") appear to be Holocene in age, as they are massive, extremely porous, slightly loose, and are not indurated to any extent, but do not extend deeper than 2±-feet in depth where locally excavated.

5. ***Faulting***

No visual or inferred evidence was observed with the limits of the exploratory trench that were suggestive of faulting locally, including our field reconnaissance and photogeologic analysis. The sedimentary layers were very distinct and unbroken, and easily traceable across the entire trench wall limits. The age of the sediments appear to be of sufficient age (late Pleistocene) to evaluate the possibility of recent faulting within the Holocene period (last 11,000 years).

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS:

1. Earth Materials

Based on review of available published data including our Field reconnaissance and subsurface exploratory trenching, the earth materials underlying the site at depth are late Pleistocene age older alluvial deposits generally comprised of interbedded fine- to coarse-grained silty sands and clayey silty sands to a depth of at least 8±-feet locally, that for the most part are in a slightly indurated condition.

2. Faulting

No active faults are believed to traverse the subject property and no indications of faulting or fault-related features were observed within the excavated limits of Exploratory Trench T-1, as delineated on the Geologic Site Map, Plate 1. No surficial indication or geomorphic features were observed on-site or within the aerial photographs that are suggestive of recent faulting. The nearest mapped through-going fault is the Wildomar Fault (Elsinore Fault Zone), located approximately one-mile to the southwest, and is considered active. The mapped fault trace as shown by Morton and Weber (see Figure 1) did not appear to be present. The caliche-lined fractures encountered appear to be related to local fracturing caused by historic strong ground motion. These fractures were found to

be random in orientation and discontinuous in both the vertical and horizontal dimensions and do not offset any of the late Pleistocene sediment contacts. Therefore, these fractures are not a result of historic on-site ground rupture but rather from random ground fracturing from a pre-Holocene strong earthquake (based on the well developed carbonate along the fractures). No building setbacks or other restrictions appear to be warranted, with respect to surface-fault rupture hazards, based on the absence of faulting which was verified by our subsurface investigation.

3. Seismicity

The primary geologic hazard that exists at the site is that of ground shaking. Ground shaking from earthquakes accounts for nearly all earthquake losses. Many factors determine the severity of ground shaking at a given location, such as size of earthquake, length of fault rupture (if any), depth of hypocenter, type of faulting (dip slip/strike slip), directional attenuation, amplification, earth materials, and others. Due to the location of the site with respect to regional faulting and the recorded historical seismic activity, moderate to severe ground shaking could be anticipated during the life of the proposed development.

4. Secondary Seismic Hazards

Based on our literature research and our filed study, there does not appear to be any potential permanent or transient secondary seismic hazards that would affect the proposed development.

5. Groundwater / Flooding

Based on available water-well data and geologic inferences, groundwater is expected to be at a depth of around 50±-feet within the local area. Any possible flood hazards should be properly evaluated by the design Civil Engineer, if warranted.

RECOMMENDATIONS:

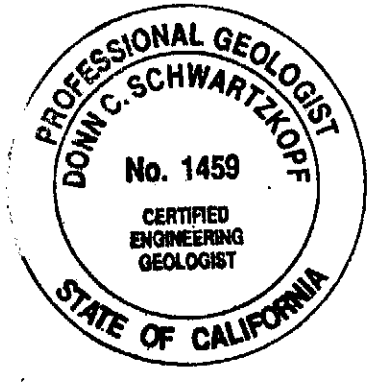
1. It is recommended that all structures be designed to at least meet the current California Building Code (CBC) provisions in the latest CBC edition; however, it should be noted that the building code is described as a minimum design condition and is often the maximum level to which structures are designed. Structures that are built to minimum code are designed to remain standing after an earthquake in order for occupants to safely evacuate, but then may have to ultimately be demolished (Larson and Slosson, 1992). It is the responsibility of both the property owner and project structural engineer to determine the risk factors with respect to using CBC minimum design values for the subject project. The previously-outlined CBC seismic classifications and probabilistic seismic hazard data have been provided for use by the project structural engineer, to aid in evaluating design criteria. This information should be used to help select the appropriate seismic design acceleration as well as the velocity design coefficients and factors as outlined in the California Building Code (CBC, 2001). Additionally, site-specific shear-wave study could be performed to properly evaluate the Soil Profile Type for seismic design purposes, if warranted.

2. We understand that the exploratory trench was backfilled in an uncompactive manner. Settling of the trench area may occur over time. Overexcavation and recompaction with proper heavy equipment is recommended if any settlement is of concern or if any temporary or permanent structures, etc., are proposed within the limits of the trenching. Such services should be supervised by a qualified soil engineer.

CLOSURE

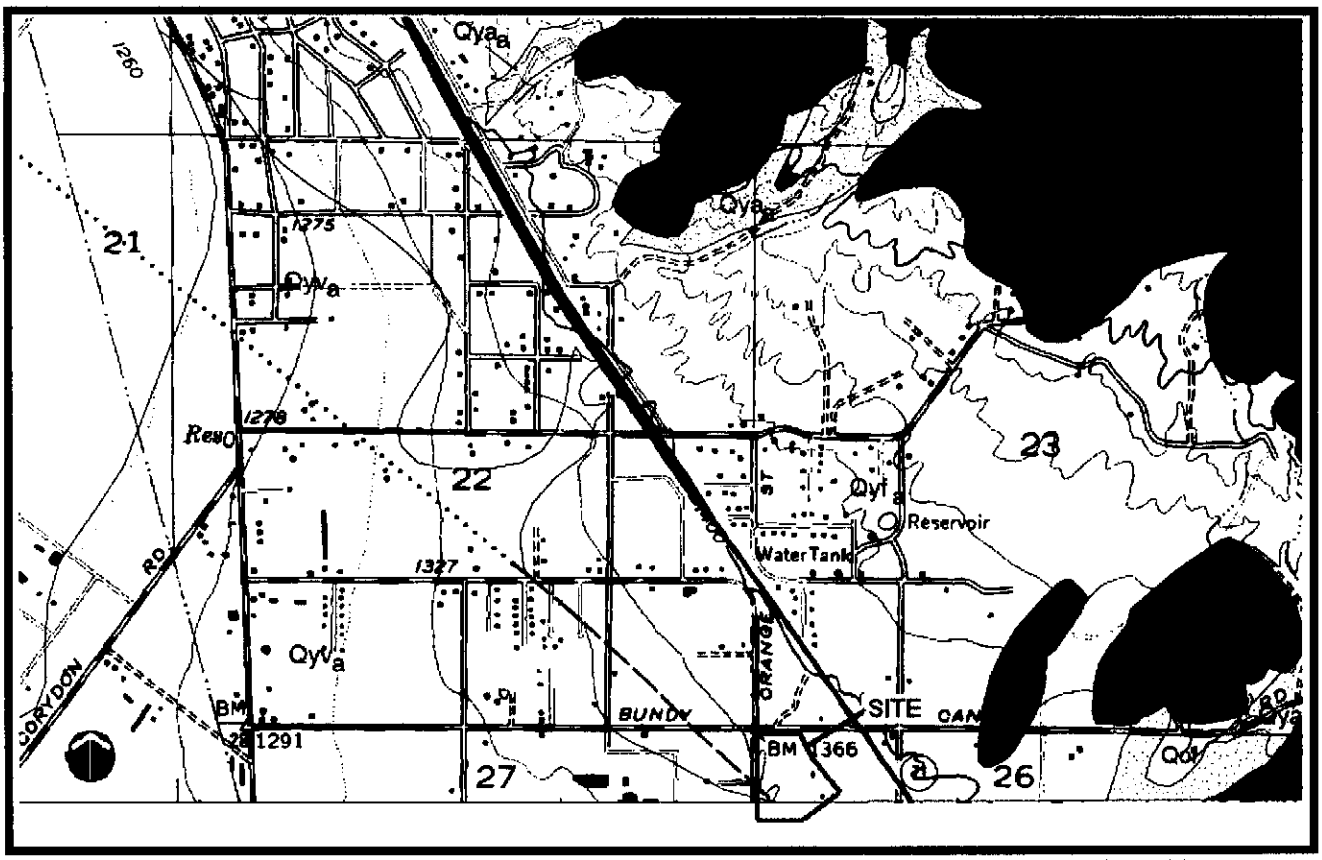
The findings, conclusions and recommendations discussed in this report are based on a field reconnaissance and an interpretation of existing geologic data, aerial photographic analysis, and subsurface exploration with respect to the present site conditions at the time of this study. We make no warranty, either express or implied. Should conditions be encountered at a later date or more information becomes available that appear to be different than those indicated in this report, we reserve the right to reevaluate our conclusions and recommendations and provide appropriate mitigation measures, if warranted. This report has been prepared utilizing the suggested "Geologic Guidelines for Earthquake and/or Fault Hazard Reports" (State of California Board for Geology and Geophysicists, 1998) and the "Technical Guidelines for Review of Geotechnical and Geologic Reports (Fault Hazard Reports, Part III)," prepared by the Riverside County Building and Safety Department (1998). It is assumed that all the conclusions and recommendations outlined in this report are understood and followed. If any portion of this report is not understood, it is the responsibility of the owner, contractor, engineer, and/or governmental agency, etc., to contact this office for further clarification.

Respectfully submitted,
TERRA GEOSCIENCES



Donn C. Schwartzkopf
Certified Engineering Geologist
CEG 1459

REGIONAL GEOLOGIC MAP



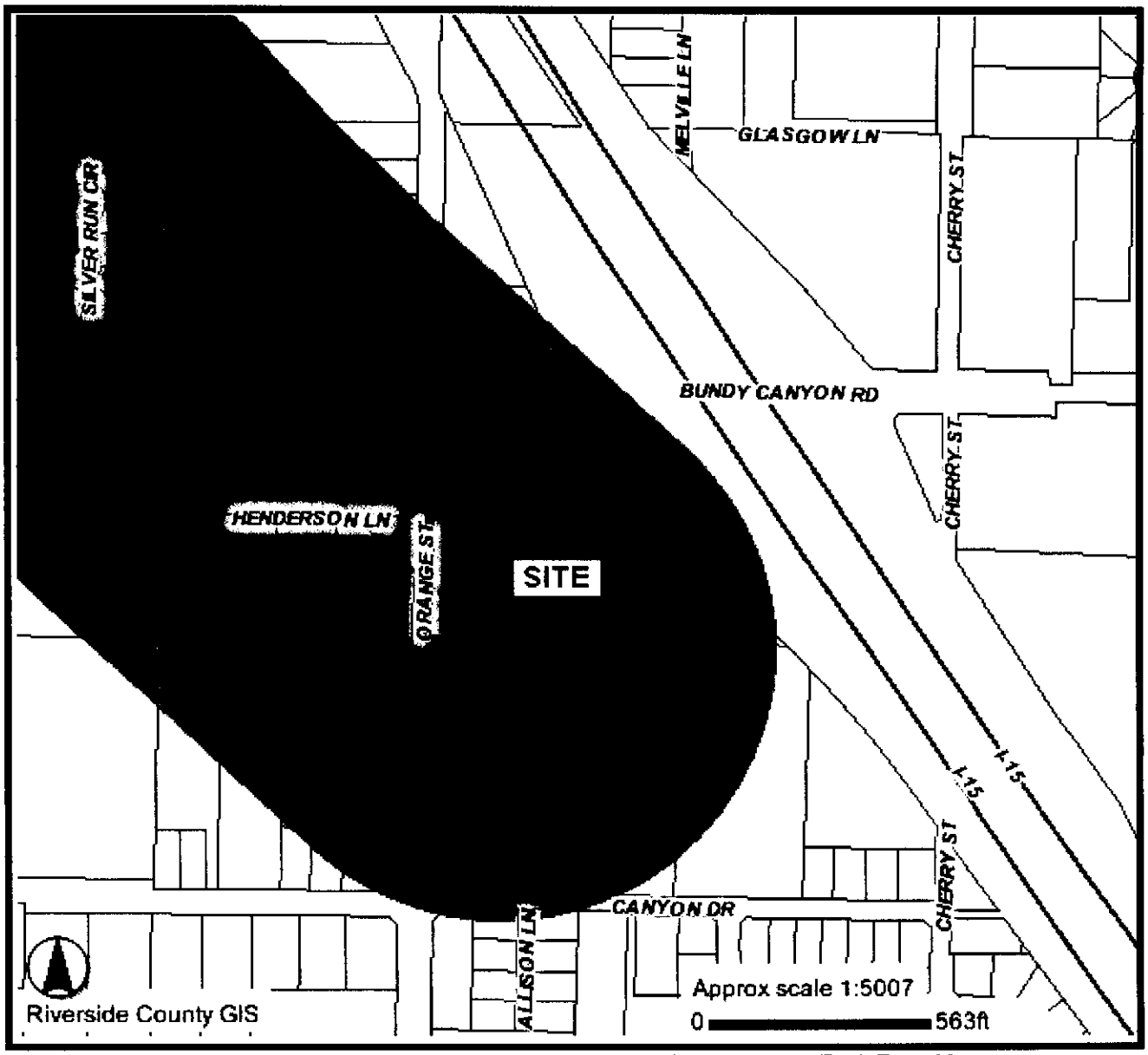
BASE MAP: Morton and Weber, 2003, U.S.G.S. Open-File Report 03-281, Scale 1"=2,300'

PARTIAL LEGEND

Qf	**VERY YOUNG ALLUVIUM**	Unconsolidated silty to bouldery alluvial fan deposits (Holocene).
Qyf	**YOUNGER ALLUVIUM**	Unconsolidated gravel, sand, and silt alluvial fan deposits (Holocene & late Pleistocene).
Qyv	**YOUNGER ALLUVIUM**	Unconsolidated sand, silt, and clay bearing valley alluvium (Holocene & late Pleistocene).
	GRANITIC ROCK	Medium-grained biotite monzogranite and less abundant granodiorite (Cretaceous).
———	**GEOLOGIC CONTACT**	Generally located within 15± meters.
——— - - - ·····	**FAULT**	Solid where located within 15± meters, dashed where located within 30± meters, dotted where concealed.

PROJECT NO. 272187-1 **FIGURE 1**

FAULT HAZARD ZONE MAP



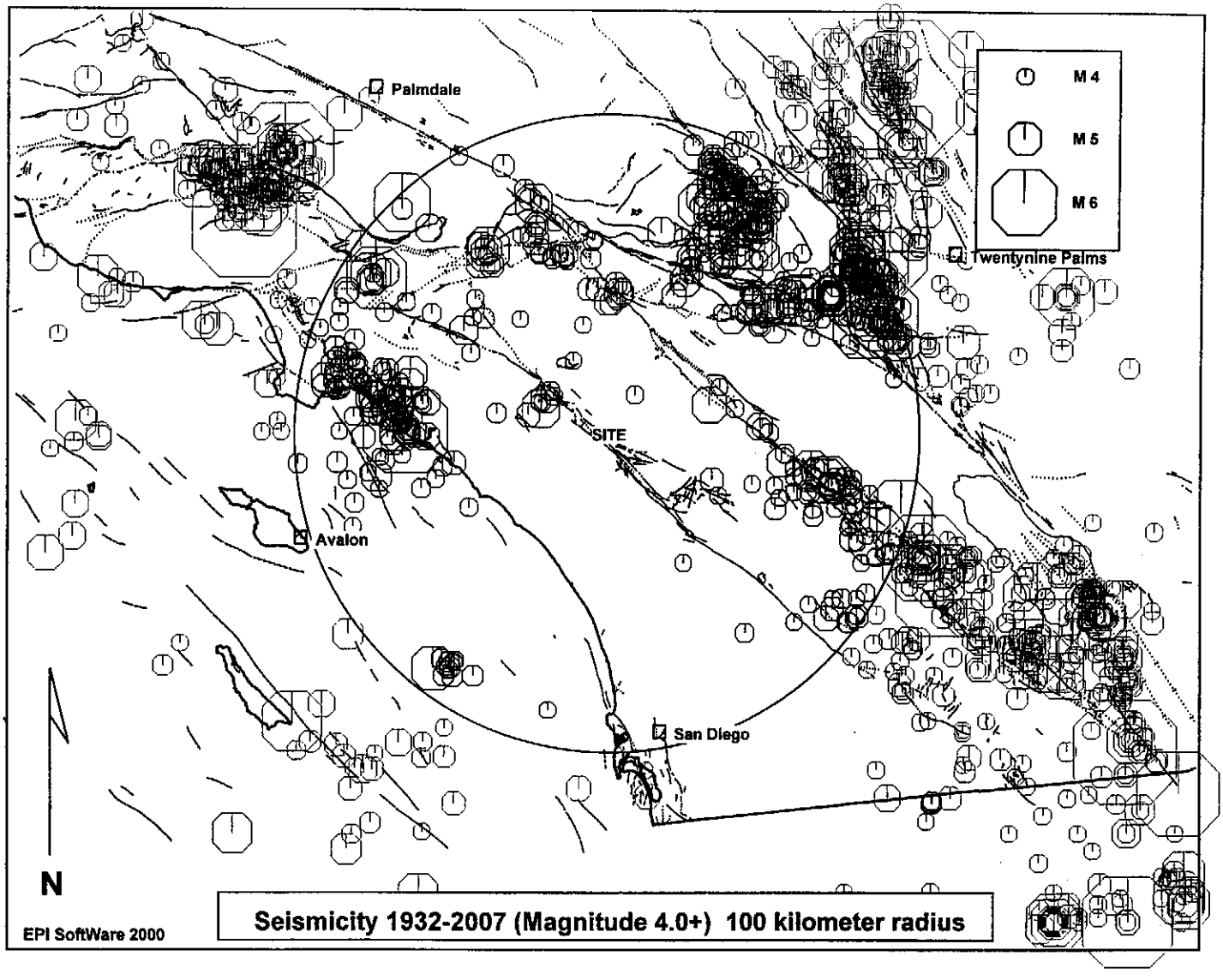
BASE MAP: Riverside County Land Information System, 2007, Fault Zone Map

BUNDY CANYON PROJECT

A.P.N. 367-100-024 & -026

WILDOMAR, RIVERSIDE COUNTY, CALIFORNIA

PROJECT NO. 272187-1 **FIGURE 2**



SITE LOCATION: 33.6254 LAT. -117.2742 LONG.

MINIMUM LOCATION QUALITY: C

TOTAL # OF EVENTS ON PLOT: 1459

TOTAL # OF EVENTS WITHIN SEARCH RADIUS 569

MAGNITUDE DISTRIBUTION OF SEARCH RADIUS EVENTS:

4.0- 4.9 : 520
5.0- 5.9 : 44
6.0- 6.9 : 5
7.0- 7.9 : 0
8.0- 8.9 : 0

0 50 100
KILOMETERS

CLOSEST EVENT: 4.1 ON FRIDAY, APRIL 27, 1962 LOCATED APPROX 15 KILOMETERS NORTHEAST OF THE SITE

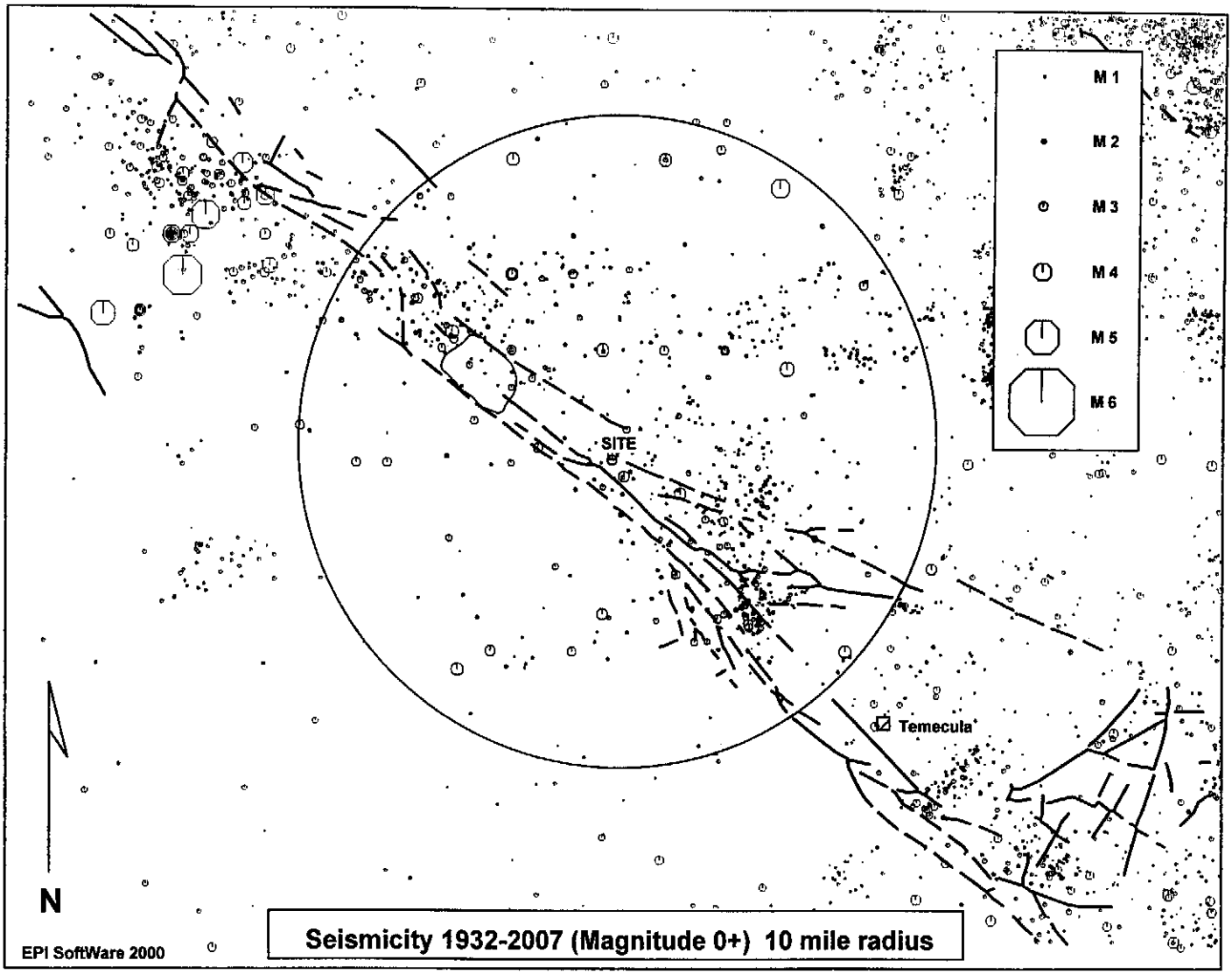
LARGEST 5 EVENTS:

6.4 ON SATURDAY, MARCH 11, 1933 LOCATED APPROX 64 KILOMETERS WEST OF THE SITE
6.3 ON SUNDAY, JUNE 28, 1992 LOCATED APPROX. 76 KILOMETERS NORTHEAST OF THE SITE
6.1 ON THURSDAY, APRIL 23, 1992 LOCATED APPROX 95 KILOMETERS NORTHEAST OF THE SITE
6.0 ON SATURDAY, DECEMBER 04, 1948 LOCATED APPROX 89 KILOMETERS NORTHEAST OF THE SITE
6.0 ON THURSDAY, MARCH 25, 1937 LOCATED APPROX 97 KILOMETERS EAST OF THE SITE

EARTHQUAKE EPICENTER MAP

PROJECT NO. 272187-1

FIGURE 3



SITE LOCATION: 33.6254 LAT. -117.2742 LONG.

MINIMUM LOCATION QUALITY: C

TOTAL # OF EVENTS ON PLOT: 4457

TOTAL # OF EVENTS WITHIN SEARCH RADIUS 768

MAGNITUDE DISTRIBUTION OF SEARCH RADIUS EVENTS:

0.0- .9 : 176
1.0- 1.9 : 475
2.0- 2.9 : 80
3.0- 3.9 : 36
4.0- 4.9 : 1
5.0- 5.9 : 0
6.0- 6.9 : 0
7.0- 7.9 : 0
8.0- 8.9 : 0

0 5 10
MILES

CLOSEST EVENT: 1.1 ON THURSDAY, SEPTEMBER 15, 2005 LOCATED APPROX .2 MILE OF THE SITE

LARGEST 5 EVENTS:

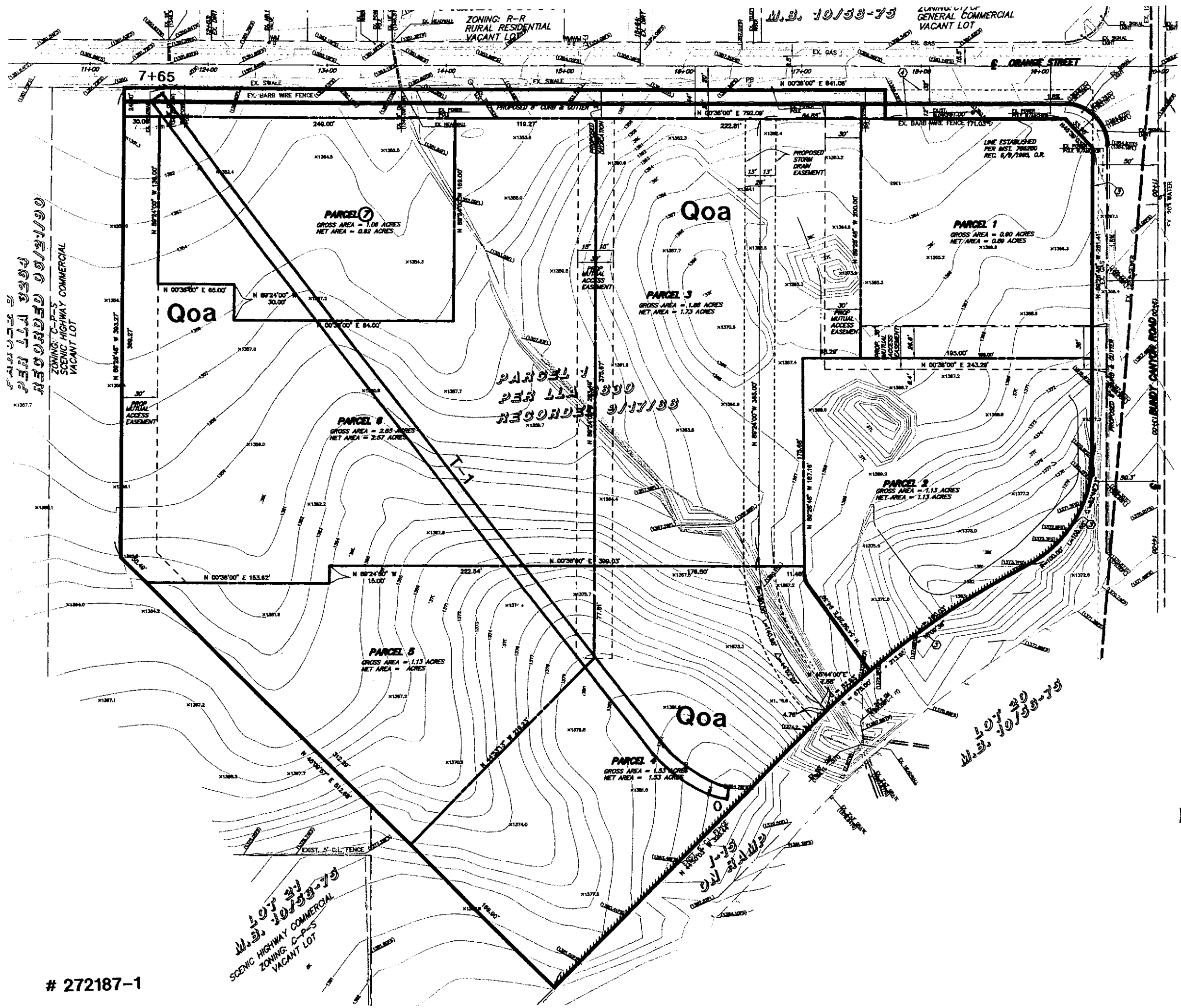
4.1 ON FRIDAY, APRIL 27, 1962 LOCATED APPROX 9 MILES NORTHEAST OF THE SITE
3.7 ON TUESDAY, OCTOBER 08, 1963 LOCATED APPROX 5 MILES NORTHEAST OF THE SITE
3.6 ON THURSDAY, JUNE 04, 1981 LOCATED APPROX. 6 MILES NORTHWEST OF THE SITE
3.5 ON FRIDAY, OCTOBER 04, 1968 LOCATED APPROX 8 MILES SOUTHWEST OF THE SITE
3.5 ON THURSDAY, MARCH 21, 1940 LOCATED APPROX 8 MILES NORTH OF THE SITE

MICROSEISMICITY MAP

PROJECT NO. 272187-1 **FIGURE 4**

GEOLOGIC SITE MAP

TENTATIVE PARCEL MAP NO. 30522



1"=80'

LEGEND

Qoa	OLDER ALLUVIAL DEPOSITS
T-1	EXPLORATORY TRENCH

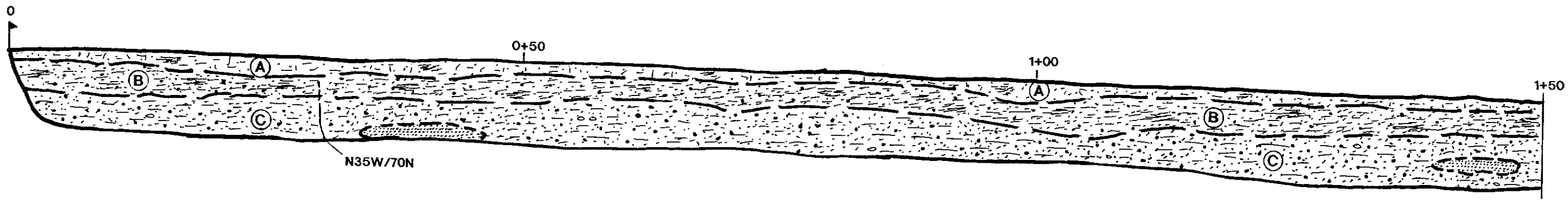
272187-1

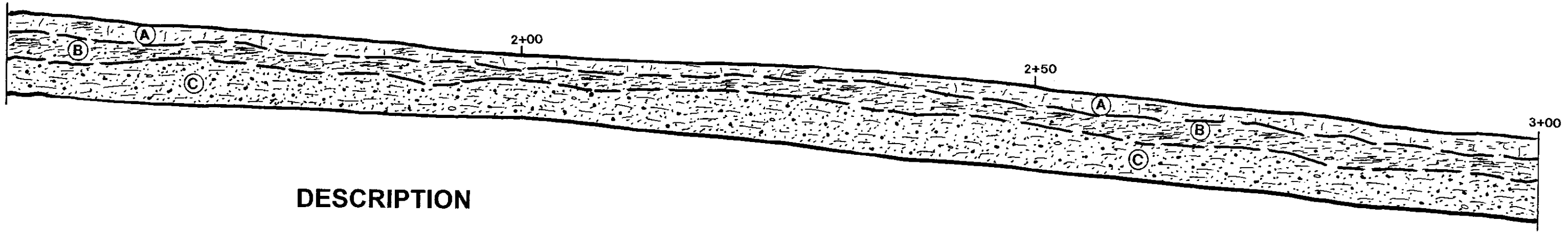
PLATE 1

Appendix A

EXPLORATORY TRENCH T-1

NORTHEAST – SOUTHWEST





DESCRIPTION

Ⓐ **CLAYEY SILTY SAND (Topsoil):** Brown (7.5YR 4/4), fine-medium grained with minor coarse, moist, cohesive, abundant root hairs, porous, firm consistency, medium prismatic soil structure, clay films along ped faces, slightly argillic, upper 8±-inches disturbed from disking.

Ⓑ **CLAYEY SILTY SAND (Older Alluvium; Late Pleistocene):** Dark Brown (7.5YR 3/4), fine-coarse grained, moist, cohesive, rootlets, porous, very firm-slightly indurated, massive to slightly blocky structure, abundant root hairs minor amounts of disseminated $CaCO_3$ as stringers and blebs.

Ⓒ **SILTY SAND (Older Alluvium; Late Pleistocene):** Slightly variegated, Yellowish Brown to Dark Yellowish Brown (10YR 4/3 to 10YR 5/4), fine-coarse grained with occasional fine gravel, moist, slightly-cohesive, minor rootlets, dense-slightly indurated, massive structure to crudely stratified, minor root hairs and pores, occasional thin high angle and wavy caliche filled fractures that are discontinuous and random in orientation, minor disseminated $CaCO_3$ as stringers, occasional friable clean sand lenses with minor silt.

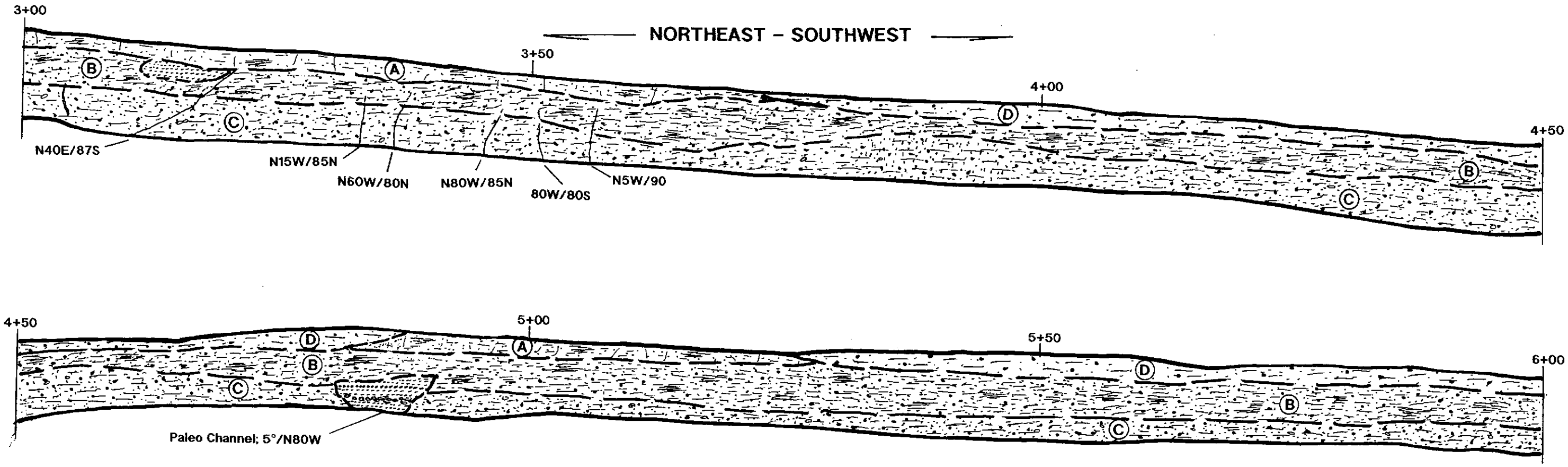
Ⓓ **SILTY SAND (Holocene):** Brown (10YR 5/3), fine-coarse grained, massive, slightly loose, dry, non-cohesive, very porous, abundant rootlets, upper 8±-inches disturbed from disking, bioturbated.

LEGEND

SCALE 1"=10' (Hor. & Ver.)

Ⓓ	Lithologic Unit
	Approximate Lithologic Contact
7+65	Trench Log Stationing
N40E/87S	Caliche-Lined Fracture (with Strike/Dip)

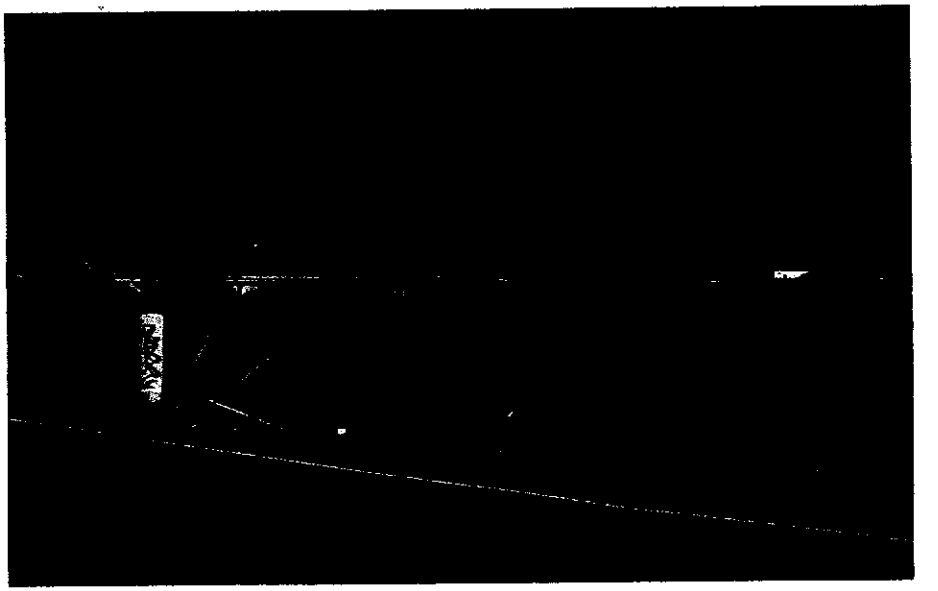
EXPLORATORY TRENCH T-1



SCALE 1"=10' (Hor. & Ver.)

Appendix B

View looking southwest at Exploratory Trench T-1.



Looking towards the northeast at Exploratory Trench T-1.

Close-up of Trench T-1 showing benches.

View showing caliche fractures in random orientations.

Unit "A" showing the prismatic soil structure.

Close-up of the massive clayey sitly sands of Unit "B."

Typical view of massive silty sands of Unit "C."

View of thin younger Unit "D" overlying Unit "B."

Appendix C

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