APPENDIX H

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Subject: Preliminary Review of Geotechnical Constraints and Geologic Hazards
Poseidon Resources Orange County Desalination Project
Huntington Beach, California

Dear Mr. Ashimine,

In general accordance with my June 2001 proposal, the following presents the results of a preliminary review of readily available geotechnical and geologic data in the vicinity of the proposed Poseidon Resources Orange County Desalination Project (PROCDP) in Huntington Beach. The information reviewed as part of this evaluation has been obtained from city, county, and state agencies, as well as from local geotechnical consulting firms and the U. S. Geological Survey. A listing of the reports reviewed for this study is presented in the ***References*** section at the end of this report.

1.0 PROJECT DESCRIPTION

The proposed project site occupies about 3.9 acres within the southeastern corner of the 22-acre AES Huntington Beach (Power) Generation Plant site in Huntington Beach, California. As currently planned, the various structures associated with the PROCDP will replace the existing "South" and "East" fuel oil storage tanks and the smaller "Distillate" fuel tank. According to the latest (undated) plant layout plan prepared by Carollo Engineers, the site of the existing "South" fuel storage tank will be replaced with a buried (submerged) product tank with an overlying administration building, product water pump station, and lime silos. It is my understanding that the excavation for the submerged product tank will involve approximately 70,000 cubic yards of soil removal. Based on 300' x 150' footprint for the buried tank as shown on Carollo Engineers' Option 3 plan, the depth of the excavation for the tank would be about 42 feet. If the existing grade of approximately (+) 5 feet above mean sea level is maintained, the bottom of the tank would be about (-) 38 feet below sea level. The site of the "East" fuel oil storage and "Distillate" fuel tanks will be occupied by a reverse osmosis (RO) building, a pretreatment filter array, and a sub-influent pump station. A number of other aboveground structures, such as a solids handling facility, chemical storage, and flush and scavenger tanks will occupy the central portion of the project area. These other structures are expected be constructed at or near existing grades adjacent to the fuel/distillate storage tanks.

2.0 REGIONAL SETTING

The project site is situated within a coastal lowland area referred to as the Santa Ana Gap (Gap), a portion of the Orange County Coastal Plain. The creation of the Gap began in Late Pleistocene time (about 60,000 years before present (ybp)) and continued until the end of the last glacial period, approximately 15,000 ybp. The combination of a lowered sea level and accelerated stream erosion produced the ancestral Santa Ana River valley approximately 200 feet deep and several miles wide. At the end of the glacial period, the sea level began to rise, and the ancestral river began backfilling the valley with coastal alluvial deposits. Much of what is known about the subsurface conditions and late Pleistocene erosion and subsequent of Holocene-age (0 to 11,000 ybp) sediment deposition in the region has been reported by the U.S. Geological Survey, the California Department of Water Resources, the Orange County Water District, and a number of site-specific investigations performed by various consulting firms for local agencies.

The Gap is underlain at shallow depths by Holocene sediments consisting of ancient river and flood plain deposits associated with the Santa Ana River, and tidal flat/ lagoonal deposits. These sediments consist of unconsolidated sand, gravel, silt and clay that includes the marine sands and gravel that comprise what is known as the Talbert water-bearing zone/ aquifer. The Talbert aquifer, which extends from about 15 to 180 feet below the ground surface, is highly susceptible to saltwater contamination due to its interconnection with the ocean and the Huntington Beach flood control channel. Isolated pockets of peat and organic soil deposits also occur within the uppermost portions of these sediments.

According to State of California Division of Oil, Gas, and Geothermal Resources Map 136 (dated November 25, 2000), the project site and surrounding area are situated within the West Newport (Oil) Field (WNF). The WNF is part of the larger Huntington Beach oil field, which is associated with what is referred to as the Newport-Inglewood Structural Trend. A number of other significant oil fields are located along the Newport-Inglewood Trend, all of which owe their existence largely to the Newport-Inglewood Fault.

3.0 SITE CONDITIONS

Topographically, the floor of the enclosure for the fuel storage and distillate tanks lies at an elevation of about 5 feet (+/-) above mean sea level, and are surrounded on all sides by a 10-to 15-foot high soil berm/ impoundment. The existing fuel storage tanks are elevated about two to three feet above the floor of the impoundment, which appears to slope gently to the east. Aside from the impoundment berms, the most significant topographic feature near the project area is the Huntington Beach Orange County Flood Control Channel (Channel) that borders the eastern margin of the project site. This 60-foot wide Channel is bounded on each side by a 5-to 7- foot high levee that separates a narrow, low-lying marsh-like region from the easterly-facing soil berm slope for the tank impoundments. According to Mr. Phil Jones (Orange County Flood Control Design Engineer, personal communication), the invert (e.g. bottom) of the Channel lies at elevation (-) 1 foot below sea level. Based on discussions with Mr. Jones and a review of a 1991 geotechnical investigation report by Geosoils, Inc., the interior sides of the levee are to be supported by driven sheet-piles in order to increase the capacity of the Channel. Each of the 33- to 36-foot long interconnecting sheet-piles will be driven to the point where only 10 to 12 feet of each pile will be exposed above channel invert. The southern limit of the new sheet-pile wall is planned to terminate near the southeast corner of the project site. It is my understanding that installation of the sheet-piles along that portion of the Channel that borders the project site is scheduled for mid 2002.

4.0 SUBSURFACE CONDITIONS and GEOTECHNICAL CONSTRAINTS

Although no site-specific geotechnical investigation has been performed for the proposed project, there have been several subsurface geotechnical/ environmental studies in the vicinity to provide the basis for the preliminary assessment of geologic hazards and geotechnical constraints presented herein. These include the environmental and geotechnical studies for the adjacent Huntington Beach Maintenance Facility (G.A. Nicoll, Inc., 1999, 2000), a geotechnical investigation by Geosoils, Inc. (1991) for the new sheet-pile walls for the nearby Channel, a Phase II environmental site assessment performed by CH2MHILL (1996); and the 1998 soil and groundwater investigation performed by Woodward-Clyde for the SCE Huntington Beach Generating Station.

The most recent report that addresses geologic and geotechnical constraints within the area is a preliminary geotechnical assessment report prepared by GeoLogic Associates (2002) for the City of Huntington Beach southeast reservoir site acquisition. The area investigated included the area surrounding the existing North and West fuel storage tanks, located about 200 feet and 700 feet north and northwest of the proposed desalination plant site, respectively. Other relevant subsurface studies include those prepared for local city and county agencies by various consulting firms, as well as by state and federal agencies (e.g. California Division of Mines and Geology, U.S. Geological Survey, and California Department of Water Resources).

4.1 Site Geology

Based on the information presented from these various sources (refer to *References* section), the native soils beneath the project site are represented by an upper 60-foot thick layer of interbedded coastal estuarine / littoral sediments consisting of fine sand, silt and clay, and mixtures thereof. According to GeoLogic Associates (2002), these sediments range in age from about 8,600 years old to the present. These native soil-like deposits are overlain at the surface by a varying thickness (about five to 10 feet) of artificial fill soils that were placed during construction for the generating station and fuel storage tanks.

Between a depth of about 60 to 90 feet, the native sediments are represented by middle to late Holocene (8,600 to 11,000 years old) fluvial (i.e. stream) deposits. These sediments are composed largely of sand and clayey sand with layers and lenses of silt and highly plastic clay that contains varying amounts of organic detritus. Below a depth of 90 feet below ground surface are Pleistocene (11,000 to 1.8 million years old) marine and nonmarine strata.

4.2 Geotechnical Constraints

According to building foundation studies by G. A. Nicoll, Inc. (2000) for the newly constructed Huntington Beach Maintenance Facility, the uppermost 13 feet of the native Holocene deposits are considered unsuitable for foundation support due to their compressible nature when placed under structural (i.e. building) loads. Limited standard penetration test (SPT) and cone penetrometer test (CPT) data (by G. A. Nicoll, Inc., 2000; and GeoLogic Associates, 2002) indicate that the uppermost 10 to 16 feet of the native sediments are highly susceptible to liquefaction during strong ground motion from nearby seismic sources. According to the study performed by GeoLogic Associates (2002), the soil layers susceptible to liquefaction were not continuous beneath the City's Southeast Reservoir site. Below a depth of about 17 to 25 feet, the native sediments have "N-values" (as derived from SPT and CPT data) that are suggestive of soils that are not prone to liquefaction. Soils below 17 to 25 feet are not considered compressible or subject to collapse under normal structural loads although some deeper sand lenses may be subject to liquefaction.

There is no current evidence that would suggest the presence of soils containing collapsible, organic peat deposits near the project site.

4.3 Groundwater Conditions

The lower part of the Holocene age sediments beneath the site consists of inter-fingering lenses of coarse sand and gravel known as the Talbert aquifer. A relatively impermeable cap of interbedded silts and clay up to about 15 feet thick overlies the Talbert aquifer. Given the proximity of the site to the Pacific Ocean, and its interconnection with the nearby Channel, depth to groundwater beneath the site is about five to seven feet. The actual elevation of the groundwater table will fluctuate with the ocean tides and water level in the neighboring flood control channel. Due to this interconnection, groundwater quality is considered brackish. Based on past pump testing, the average permeability of the Talbert aquifer is approximately 1000 gallons per day per square foot (Woodward-Clyde, 1998).

According to the information presented in the environmental assessment reports by CH2MHILL (1996), Woodward-Clyde (1998), G.A. Nicoll, Inc. (1999), and Bryan Stirrat & Associates, Inc., 2002) there is no indication of any significant groundwater contamination (aside from seawater intrusion) of the Talbert aquifer in the immediate vicinity of the project site.

Dewatering of the upper portion of the Talbert aquifer will likely be required in order to safely excavate the site of the proposed submerged product water tank/reservoir.

4.4 Corrosive Soils

According to limited laboratory testing by GeoLogic Associates (2002), near surface soils have a relatively high pH value (8.4), low resistivity (170 ohm-cm) and high soluble sulfate content (4000 ppm), indicating these soils are considered highly corrosive to concrete and metals in contact with these soils.

5.0 GEOLOGIC HAZARDS

5.1 Faulting and Seismicity

The project site lies within the seismically active southern California region that is subject to the effects of moderate to large earthquake events along major faults. The site is *not* located within an Alquist-Priolo Earthquake Fault Zone. Regional faults that could affect the project are the Newport-Inglewood Fault Zone (NIFZ), Compton-Los Alamitos Blind Thrust Fault, Elysian Park Blind Thrust Fault, and Palos Verdes, Whittier-Elsinore, Sierra Madre-Cucamonga, and San Andreas fault systems. The closest regional fault (zone) to the site is the NIFZ, specifically the segment known as the South Branch Fault (SBF), which projects directly beneath the existing South fuel oil tank and the northern portion of the proposed desalination plant. Extensive faulting-related studies on the SBF by Leighton & Associates for the Bolsa Chica Project (as referenced on page V-EH-9 of the 1995 City of Huntington Beach General Plan EIR) suggests that the SBF is neither active nor potentially active. However, the City's General Plan EIR indicates that this "Category C" fault (as defined by Leighton & Associates, 1986) requires special studies, including a subsurface investigation for critical and important land uses. The main trace of the NIFZ (i.e. the North Branch Fault) is located approximately 0.3 mile north of the project site.

As part of GeoLogic Associates' (2002) preliminary geotechnical assessment for the City's Southeast Reservoir site acquisition, a subsurface stratigraphic correlation/ fault investigation was performed to assess the presence and/or potential for surface fault rupture within the Holocene-age deposits. According to the criteria established by the California Division of Mines and Geology, a fault is considered "active" if it can be demonstrated that the fault has produced surface displacement within Holocene time (about the last 11,000 years).

Due to the presence of a relatively thick layer of fill soils and shallow groundwater, conventional fault trenching and soil-stratigraphic techniques could not be employed by GeoLogic Associates to assess the presence and/or potential for surface fault rupture within the two reservoir sites. Instead, their investigation involved the use of CPT and exploratory borings for stratigraphic correlation purposes, as well as that use of radiocarbon dating of organic sediments and shells obtained from the exploratory borings. According to Geologic Associates' stratigraphic correlation study, no evidence of faulting within Holocene sediments was found beneath either site (i.e. North and West fuel storage tanks). The report concludes that the risk of surface fault rupture is minimal over the lifetime of the proposed project (i.e. Southeast Reservoir), yet the stratigraphic correlation on which the assessment was based favors the North tank site.

Based on my review of GeoLogic Associates' (2002) soil correlation data, there still remains a possibility that surface fault rupture potential exists in the southern half of the proposed desalination plant.

The next closest regional fault to the project area is the Compton-Los Alamitos Blind Thrust Fault, situated approximately 4 miles directly below the project area (Shaw, 1993). The Elysian Park Blind Thrust, Palos Verdes, Whittier-Elsinore, Sierra Madre-Cucamonga, and San Andreas fault systems are situated between approximately 6 to 50 miles from the site.

Based on a deterministic seismic hazard evaluation, which takes into account a maximum magnitude earthquake M6.9 on the NIFZ, the expected maximum horizontal ground motion (measured in percent of gravity "g") from this seismic source would be approximately 0.9g. In the event of a major earthquake (M6.8) on the Compton-Los Alamitos Blind Thrust Fault (which could be similar to the blind thrust that produced the 1994 Northridge earthquake) directly below the project site, the maximum ground acceleration could exceed 1g.

According to the 1999 Seismic Shaking Hazard Maps of California, probabilistic seismic hazard analysis (PSHA) indicates the level of ground motion at the site that has 10% chance of being exceeded in 50 years (475 year return period) is approximately 0.4g. These analyses consider all seismic sources within the southern California area. This value of 0.4g is in agreement with a March 2000 PSHA performed by G.A. Nicoll, Inc. for the new Huntington Beach Maintenance Facility, located immediately north of the project area at the end of Edison Street; and the PSHA performed by GeoLogic Associates (2002) for the City's Southeast Reservoir site acquisition project.

Although the conclusions reached by Geologic Associates (2002) that the potential risk of primary surface rupture at the nearby (proposed) reservoir site is minimal, there still remains a "window" of possible faulting within the southern half of the proposed desalination plant site. A similar form of the subsurface stratigraphic correlation investigation as performed by GeoLogic Associates (2002) should be undertaken as part of the site-specific geotechnical investigation for the project.

5.2 Secondary Seismic Hazards

Secondary seismic hazards are generated by strong ground motion/ shaking from a nearby or distant earthquake and can result in permanent ground deformation. The types of hazards resulting from strong ground motion include liquefaction, lateral soil spread, subsidence or ground settlement, landslides or slumps, tsunami runup and seiche.

Liquefaction

As shown on the State of California's Seismic Hazard Zone Map for the Newport Beach Quadrangle, the City's General Plan "Liquefaction Potential" Map, the project site lies within an pile wall improvements for the Channel, and the preliminary geotechnical assessment for the City's Southeast Reservoir site acquisition. Typical methods to mitigate the potential impacts resulting from liquefaction include the following:

- Overexcavation and recompaction of the liquefaction-prone soils;
- In-situ soil densification such as vibro-floation, vibroreplacement (i.e. stone columns);
- Injection grouting; or
- Deep soil mixing

The geotechnical assessment performed by GeoLogic Associates (2002) concludes that the proposed nearby Southeast Reservoir can be supported by a conventional concrete mat type foundation, provided provision is made to accommodate the anticipated settlements due to consolidation of the uppermost saturated, soft clay layers and the potential post-liquefaction settlements. GeoLogic Associates (2002) also indicates that soil conditions would not preclude use of other foundation systems, which can be evaluated when design concepts are available.

Lateral Spread

Lateral spreading involves the dislocation of the near surface soils generally along a near-surface liquefiable layer. In many cases, this phenomenon of shallow landsliding occurs on relatively flat or gently sloping ground adjacent to a "free face," such as an unsupported channel wall along a stream or flood control channel. Given the "weak" nature of the near surface, fine-grained sediments, shallow groundwater, liquefaction-prone soils, and the nearby flood control channel, there is a high potential for lateral spread beneath the site during a major earthquake in the area. According to discussions with Mr. Phil Jones at Orange County Flood Design, the sheet-piles that are to be installed along the sides of the Channel are not designed to resist liquefaction or lateral loads that could occur as the result of a lateral spread.

None of the geotechnical reports reviewed for this study addressed the potential for lateral spread. An in-depth analysis concerning this potentially significant risk should be required as part of the geotechnical investigation for the project.

Earthquake-Induced Ground Settlement and Subsidence

Due to the relatively loose, unconsolidated nature of the near-surface soils, there is a high potential for earthquake-induced ground settlement within the project area. According to the liquefaction evaluation performed by GeoLogic Associates (2002), it is anticipated that liquefied soils may experience post-liquefaction settlements of 4 to 5 inches.

If some form of mitigation were ultimately required, measures would include removal and recompaction of the settlement-prone soils, or the use of deep foundations.

Landslides and Slumps

The potential for seismically induced landsliding along the levee of the neighboring Channel is considered moderate to high. The new sheet-pile walls that are to be constructed along the interior walls of the levee are not designed to withstand potentially large lateral forces associated with strong ground motion from a nearby earthquake. As such, earthquake-induced slope instability should be considered as part of the geotechnical evaluation for the project. It is my understanding that the existing soil berms that surround the fuel storage tanks will not be removed, and will remain as part of the project.

Tsunamis and Seiches

According to D.S. Mc Culloch (*in* U.S. Geological Survey Professional Paper 1360, p 400), the heights of the 100- and 500-year tsunamis along the coastal area of Huntington Beach are 5 feet and 7.5 feet, respectively. The resulting seiches within the Channel would likely be somewhat less, given the frictional energy dissipation along the bottom and walls of the channel. Given that the existing exterior containment berms along the eastern and southern margins of the project area are to remain, the likelihood of seiches or tsunamis impacting the site is considered low.

6.0 Active or Abandoned Oil/ Gas Wells

Based on a review of the November 25, 2000, Division of Oil, Gas, and Geothermal Resources Map No.136, there are no producing or abandoned oil or gas wells within the limits of the project area. The closest producing oil wells are located north of the project site at the end of Edison Street, near the Huntington Beach Maintenance Facility. The closest abandoned (dry hole) wells are located approximately 300 feet north, and another approximately 600 feet southwest of the project area.

There are no indications that the site or surrounding area has experienced any significant subsidence due to oil and gas extraction.

7.0 SUMMARY OF IMPACTS AND MITIGATING MEASURES

Based on the information presented above, the following summary of project-related impacts related to geotechnical constraints and geologic hazards has been preliminarily identified in the vicinity of the project area. Mitigating measures for each impact follows each of the identified impacts.

7.1 Impacts and Mitigating Measures

- ***Impact # 7.1.1***: Depth to groundwater beneath the project area is approximately five feet. Groundwater quality is considered brackish. Saturated soils and caving conditions would be

- encountered during excavation for the product water storage tank, or if remedial grading associated with removal and recompaction of soils within several feet above, or at any depth below the groundwater table.

  Mitigation #7.1.1: In order to excavate for the buried product water storage tank site, dewatering will be necessary and the sides of the excavation will require some form of lateral support. Groundwater pumped from the dewatering wells will also require some form of treatment before it could be discharged to any surface water body, such as the Santa Ana River or Pacific Ocean.

  In order to prevent the buried tank from "floating" when water levels in the tank are drawn down, it will be necessary to either "anchor" the tank down with piles, add additional weight to the tank itself, and/or add a soil surcharge across the top of the tank.

- ***Impact #7.1.2:*** The uppermost 17 feet of the native soils within the project area are considered compressible upon placement of structural loads (e.g. aboveground storage tanks, single and multi-story buildings, etc.). Unless some form of mitigation is performed, the proposed structures could experience significant structural distress.

  Mitigation #7.1.2: Complete removal and recompaction of compressible soils (although this would require dewatering and support of the walls of the excavation), or use piles and grade beams to support the structure(s).

- ***Impact #7.1.3:*** The uppermost 16 feet of native soils in the project area are highly susceptible to liquefaction and up to approximately 4 to 6 inches of seismically-induced settlement. Unless some form of mitigation is performed, the proposed structures, with the exception of the buried product water storage tank, could experience significant post-liquefaction distress.

  Mitigation #7.1.3: Typical methods to mitigate the potential impacts resulting from liquefaction include the following:

  1. Overexcavation and recompaction of the liquefaction-prone soils;
  2. In-situ soil densification, such as vibro-floation, vibroreplacement (i.e. stone columns);
  3. Injection grouting; or
  4. Deep soil mixing

- ***Impact #7.1.4:*** The subsurface trace of the SBF of the seismically active Newport-Inglewood Fault Zone may project beneath the southern half of the project site.

  Mitigation #7.1.4: A subsurface fault investigation, similar to the one performed by Geologic Associates (2002) for the nearby Southeast Reservoir site acquisition project, should be performed to assess the nature and extent of possible surface-fault rupture across the site. If evidence for potential fault-surface rupture is found, an appropriate "setback" for structures from the zone of surface faulting will be required.

- ***Impact #7.1.5:*** The presence of underlying liquefaction-prone soils and the site location relative to the Channel poses a risk of seismically induced lateral spread. Significant distress to both above- and below-ground structures would occur in the event of this form of seismically-induced landsliding

  Mitigation #7.1.5: The potential of lateral spread should be performed as part of the site-specific geotechnical investigation for the project. If found to be possible, subsurface reinforcement of the potential zone of lateral spread will be necessary. The methods to mitigate lateral spread are similar to those presented above to mitigate soils prone to liquefaction.

- ***Impact #7.1.6:*** Given the proximity to major active faults, severe ground motion, perhaps exceeding 1g should be expected at the site.

  Mitigation #7.1.6: All structures associated with the proposed desalination plant should be designed to withstand the "design-level" earthquake as set forth in the latest edition of the Uniform Building Code. However, given the proximity to the Newport-Inglewood and Compton Blind Thrust faults, more stringent design measures may be warranted or required.

- ***Impact # 7.1.7:*** Near surface soils are highly corrosive to cement and metals in contact with these soils.

  Mitigation #7.1.7: The use of Type V cement should be used for concrete and special coatings or other measures should be used to protect metal pipes against the effects of corrosion.

Once a site layout and grading plan has been approved, a site-specific geotechnical evaluation of each of the constraints and geologic hazards indicated above, as well as other engineering parameters, will be required.

CLOSURE

In the absence of a site-/ project-specific geotechnical report, the information presented herein is intended to serve as a preliminary evaluation of the geotechnical and geologic constraints for the proposed PROCDP. Each of the geotechnical issues discussed herein, as well as other relevant geotechnical aspects, will require a thorough evaluation as part of the geotechnical investigation that would be required for development of the project.

The findings and recommendations presented in this report were obtained from a review of previously published and unpublished literature in agreement with the general principles and practices in engineering geology. I make no other warranty, either express or implied.

Please call the undersigned if you have any questions, or require clarification of the information presented in this report.

Respectfully Submitted,

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Principal Engineering Geologist

Reviewed by:

James Weaver, GE
Vice President- Geomatrix Consultants

REFERENCES

Barrows, A.G., 1974, A Review of the Geology and Earthquake History of the Newport-Inglewood Structural Zone, Southern California: California Division of Mines and Geology Special Report 114.

Bryan Stirrat & Associates, Inc., 2002, Focused Site Investigation Report (for) Southeast Reservoir Site Acquisition, Huntington Beach, California; prepared for City of Huntington Beach Department of Public Works, dated May 23, 2002.

Bryant, W.A., 1988, Recently Active Traces of the Newport-Inglewood Fault Zone, Los Angeles and Orange Counties, California: California Division of Mines and Geology Open-File Report 88-14.

REFERENCES (con't)

California Department of Water Resources (Southern District), 1967, Progress Report on Ground Water Geology of the Coastal Plain of Orange County.

California Division of Oil, Gas, and Geothermal Resources Map Sheet 136, November 25, 2000, scale 1' = 500'.

California Division of Mines and Geology, 1976, Environmental Geology of Orange County, California: Open-File Report 79-8 LA.

___________________________________, 1995, The Northridge, California, Earthquake of 17 January 1994: Special Publication 116.

___________________________________, 1996, Probabilistic Seismic Hazard Assessment for the State of California: DMG Open-File Report 96-08.

___________________________________, 1997, Guidelines for Evaluating and Mitigating Seismic Hazards in California: DMG Special Publication 117.

_________________________________, 1997, State of California Seismic Hazards Zones, Newport Beach Quadrangle, scale 1:24,000.

_________________________________, 1997, Fault - Rupture Hazard Zones in California, Special Publication 42 (Revised 1997).

CH2MHILL, 1996, Huntington Beach Generating Station Phase II Environmental Site Assessment (Volume 1): consultants DRAFT report prepared for Southern California Edison Company, dated November 27, 1996, P.O. No. C4096906.

City of Huntington Beach, 1995 Environmental Hazards Element of the City of Huntington Beach General Plan EIR (Section 5.6-Geology and Soils): dated July 5, 1995.

Coastal Frontiers Corp., 1988, Technical Memorandum "Wave Heights at Parking Lot Bridge" Talbert Channel: consultants report prepared for Simons, Li & Associates, dated October 14, 1988, ref. CFC-118-88 Talbert Channel.

Fuller, D.R., 1980, Talbert and Bolsa Aquifer Map; in Sprotte, E.C. et.al., Classification and Mapping of Quaternary Sedimentary Deposits for Purposes of Seismic Zonation, South coastal Los Angeles Basin and Orange County California: California Division of Mines and geology Open-File Report 80-19, Map No. 5, scale 1:62,500.

REFERENCES (con't)

G.A.Nicoll, Inc., 1999, Limited Phase II Environmental Investigation (for) Future Huntington Beach Maintenance Facility east End of Edison Road, East of Newland Street, Huntington Beach, California: consultants report prepared for the City of Huntington Beach, dated July 9, 1999, Project No. 5670-09.

G.A.Nicoll, Inc., 2000, Geotechnical Investigation for Future Huntington Beach Maintenance Facility East End of Edison Road, East of Newland Street, Huntington Beach, California: consultants report prepared for the City of Huntington Beach, dated March 27, 2000, Project No. 5670-04

GeoLogic Associates, 2002, Preliminary Geotechnical Assessment (for) Southeast Reservoir Site Acquisition, Huntington Beach California: prepared for City of Huntington Beach Public Works Department, dated May 24, 2002.

Geosoils, Inc, 1991, Geotechnical Investigation Huntington Beach Channel (Flood Control Facility No. D01) City of Huntington Beach, County of Orange, California: consultants report prepared for Orange County Environmental Management Agency, dated February 21, 1991, W.O. 2233-A-OC.

Grant, L.B., et. al., 1997, Paleoseismicity of the North Branch of the Newport-Inglewood Fault Zone in Huntington Beach, California from Cone Penetrometer Test Data: Bulletin of the Seismological Society of America, vol. 878, No 2, pp.277-293, April 1997.

Morton, P. K. and Miller, R.V., 1981, Geologic Map of Orange County, California Showing Mines and Mineral Deposits: California Division of Mines and Geology Bull. 204, scale 1:48,000.

Piper, A.M., Garrett, A.A., et.al, 1953, Native and Contaminated Ground Waters in the Long Beach - Santa Ana Area, California: U.S. Geological Survey Water Supply Paper 1136.

RBF Consulting, 2001, Administrative Draft Preliminary Hazardous Materials Assessment for the Southeast Coastal Area Redevelopment Project Located within the City of Huntington Beach, County of Orange, State of California: consultants report prepared for the City of Huntington Beach, dated January 11, 2001, Job No. 10-100848.001.

Shaw, J.H., 1993, Active Blind-Thrust Faulting and Strike-Slip Fault-Bend Folding in California: Ph.D. dissertation, Princeton University, October 1993, 216 pp.

South Coast Geological Society, 1992, The Regressive Pleistocene Shoreline Coastal Southern California: Annual Field Trip Guide Book No. 20.

REFERENCES (con't)

U.S. Geological Survey, 1985, Evaluating Earthquake Hazards in the Los Angeles Region-An Earth-Science Perspective (J.I. Ziony, Editor): U.S. Geological Survey Professional Paper 1360.

___________________, 2001, Preliminary Digital Geologic Map of the Santa Ana 30' x 60' Quadrangle, Southern California (Version 1), scale 1:100,000: compiled by D.M. Morton, U.S. Geological Survey, Dept. of Earth Sciences at University of California, Riverside.

Woodward-Clyde, 1998, Site Investigation Report for Soil and Groundwater Huntington Beach Generating Station, Huntington Beach, California: consultants final report prepared for Morrison & Foerster, dated May, 1998, project no. 97SB044.