IV. ENVIRONMENTAL IMPACT ANALYSIS E. GEOLOGY AND SOILS

The following section summarizes the findings and conclusions presented in the <u>Geotechnical</u> <u>Feasibility Investigation for the Proposed Commercial Development, Roadways and Railroad</u> <u>Alignment in Area "A", Honeywell Property, 850 South Sepulveda Boulevard, El Segundo, California,</u> prepared by Albus-Keefe & Associates, Inc. dated May 20, 2003. The background data for the Geotechnical Report is included in Appendix G of this Draft EIR.

Proposed actions on the Sepulveda/Rosecrans Rezoning Site consist of: changing the General Plan land use designation for 70.8 net acres of the Sepulveda/Rosecrans Rezoning Site from Heavy Industrial to Commercial Center; changing the zoning of the 70.8 net acre portion of the site to C-4 (Commercial Center); the full buildout of the C-4 zoned portion of Sepulveda/Rosecrans Rezoning Site in accordance with the standards established in the proposed C-4 zone, and construction and operation of the proposed Plaza El Segundo Development. The following existing setting section addresses the entire Sepulveda/Rosecrans Rezoning Site, since underlying geotechnical conditions are the same for all areas of the Sepulveda/Rosecrans Rezoning Site, including the proposed Plaza El Segundo.

ENVIRONMENTAL SETTING

The Sepulveda/Rosecrans Rezoning Site is located in the City of El Segundo in the western portion of the Los Angeles Basin (basin), which is characterized by a coastal belt of Pleistocene age, stabilized dunes and sand deposits referred to as the El Segundo Sand Hills. The basin is a central alluvial lowland that slopes gently to the south and is bordered by highlands and their foothills.¹ The basin overlies a structural depression where discontinuous deposition has occurred from both marine and continental origins since late Cretaceous time with primarily marine deposition and continuous subsidence since the mid-Miocene epoch. The marine deposits are primarily fine-grained and were deposited during the marine transgressions.² The continental deposits, primarily coarse-grained, were deposited during the regressions. Fine-grained marine deposits typically form the aquicludes³ found in the basin, while the aquifers represent deposits of both stream deposition from the surrounding uplifted areas and marine deposition.

¹ Phase I Site Assessment Report El Segundo Plant by Brown and Caldwell, November 1996.

² Marine transgression is the spread of the sea over land areas and the consequent unconformable deposit of sediments on older rocks.

³ Tight rocks, those with few and small holes that may be poorly connected, produce very little water and are called aquitards or aquicludes. Aquicludes block water flow almost completely, whereas aquitards permit some flow of water, albeit commonly at such a low rate that it is of little use. U.S. Geological Survey.

The basin is at the juncture of three Southern California physiographic providences: the Traverse Ranges to the north, the Peninsular Ranges to the east and southeast, and the Continental Borderland to the west.⁴ The Sepulveda/Rosecrans Rezoning Site is located in the West Coast Basin, a small subbasin in the southwestern part of the Los Angeles Basin. The West Coast Basin is bounded by the Santa Monica Mountains to the north, the Newport-Inglewood Uplift to the east, the Palos Verdes Hills to the southwest, and the Pacific Ocean to the west and to the southeast. Currently, the Newport-Inglewood fault zone acts as a partial water barrier to groundwater flow between the West Coast Basin and the Central Basin to the east.

The site is located in a coastal belt of dunes and sand hills called the El Segundo Sand Hills. These sand hills extend from Ballona Gap south to Torrance and the Palos Verdes Hills, and extend from the Pacific Ocean inland approximately 3 or 4 miles. In the vicinity of the Sepulveda/Rosecrans Rezoning Site, the sand hills are composed of older, stabilized sand dunes of Pleistocene age.

The Sepulveda/Rosecrans Rezoning Site was previously developed with a variety of industrial and commercial manufacturing uses. The structures associated with Honeywell International, Inc and General Chemical have been demolished. Two industrial uses (Air Products and Learned Lumber) are currently active on the Sepulveda/Rosecrans Rezoning Site. Vegetation consists of a medium growth of weeds, bushes, ice plant, and other forms of vegetation. Minor fill materials and debris were also observed on the surface of the Sepulveda/Rosecrans Rezoning Site. On the Sepulveda/Rosecrans Rezoning Site, there are 5 unlined natural depressions. Unlined depressions 1, 2 and 3 are located on the Plaza El Segundo portion of the Sepulveda/Rosecrans Rezoning Site. Unlined depressions 4 and 5 are located on the remaining portion of the Sepulveda/Rosecrans Rezoning Site and are bounded by ascending railroad embankments to the north and south and surrounded by chain link fencing at the base of the embankments on all sides.

According to the City of El Segundo General Plan (1992), there are no unique geologic features in the vicinity of the Sepulveda/Rosecrans Rezoning Site. Therefore, no unique geologic features would be modified or destroyed as a result of the development of the Sepulveda/Rosecrans Rezoning Site.

Regional Geologic Materials

The sediments underlying the Los Angeles Basin including the Sepulveda/Rosecrans Rezoning Site, are divided into eight geologic formations.⁵ These formations are described below from the most recent to the oldest.

⁴ Phase I Site Assessment Report El Segundo Plant by Brown and Caldwell, November 1996.

⁵ Ibid.

Older Dune Sand

These late Pleistocene-aged wind blown deposits are primarily of fine to medium sand of uniform texture with minor sandy silt, clay and gravel lenses.

Alluvium

These Recent to late Pleistocene deposits consist primarily of unconsolidated, stream deposits gravel, sand, silt, and clay with some interbedded littoral estuary or bay deposits near the ocean.

Lakewood Formation

This Pleistiocene-aged formation contains primarily shallow marine and, silt, and gravel.

San Pedro Formation

Yellow brown, silt, clay, sand, and gravel comprise this formation. This deposit, dating from the upper Pleistocene to the Recent, represents the transition from neritic (shallow marine along the continental shelf) to nonmarine deposition.

Pico Formation

This marine-derived (bathyal and neritic) formation is composed of micaceous siltstone and claystone, interbedded with shale and sand. The Pico is dated from the upper Pliocene to upper Pleistocene.

Repetto Formation

The Pliocene-aged Repetto Formation contains interbedded fine-to coarse-grained sandstone, pebbly sandstone, sandy micaceous shale, siltstone, and claystone. The Repetto varies in thickness from 1,000 to greater than 18,000 feet in the Los Angeles Basin.

Puente Formation

The Puente Formation, deposited during the middle Miocene to the early Pliocene, is comprised of a lower shale member, and intermediate sandstone member, and an upper shale member. The thickness of the units vary considerably due to internal unconformities, gradation contacts, and interfering deposits.

Catalina Schist

These basement rocks consist primarily of fine-grained chlorite-quartz schist and blue glaucophane-or crosstie-bearing schist. It is derived from greywacke, chert, and basaltic volcanics and gabbro. It dates from the early Cretaceous to the Jurassic.

Local Geological Materials

The soils encountered at the Sepulveda/Rosecrans Rezoning Site while drilling were primarily finegrained, poorly graded, dense sands with intermittent lenses of silty sand.⁶ Seven of the borings and pilot boreholes found terminated in clayey silt materials thought to represent the Manhattan Beach aquitard. The fine-grained soils were typically encountered at elevations of approximately 0 to -7 feet relative to MSL.

Samples of the fine-grained sand representative of the aquifer, collected from MW-1, MW-3, MW-5, and fine-grained sediments representative of the aquitard, collected from TB-3 and MW-1, were submitted for grain size distribution analysis.⁷ In addition, soil samples collected from MW-1 representing the fine-grained sand and clayey materials were analyzed for mineralogy by X-ray diffraction. Analytical results indicate that the aquifer sediments consist predominantly of fine to very fine sand with approximately 12 percent silt and clay. The aquitard sediments are predominantly silt with approximately 16 percent very fine sand and 5 percent clay. The predominant minerals of the aquifer are plagioclase feldspar, quartz and potassium feldspar, and the fine-grained sediments consist primarily of quartz, plagioclase feldspar and smectite.

Subsurface exploration for the geologic materials was conducted using a truck-mounted Cone Penetrometer System (CPT).⁸ A total of 9 CPT soundings were conducted with depths ranging from 9 to 30 feet below ground surface (bgs). The approximate boring locations are depicted in Figure IV.E-1.

Based on interpretation of the CPT data, non-engineered fill materials are present within the study area. The fills typically consist of poorly-graded sands and some silty sands. These materials are generally medium dense and damp to moist. The thickness of non-engineered fill is estimated to be less than three feet in the vicinity of CPT 2, 3, 4 and 7 and approximately 10 to 13 feet deep in the vicinity of CPT 1, 5, and 6. Debris is apparently present within the fill located near CPT-5 and 6 at the depth of 7 to 12 feet and many include large particles of concrete or other resistant material.

Older dune sand is present underlying the artificial fill throughout the Sepulveda/Rosecrans Rezoning Site. This unit is generally characterized as poorly-graded sands and some silty sands with occasional finer-grained lenses up to 1 foot thick. These materials are generally medium dense to dense and moist.

⁶ Ibid.

⁷ Ibid.

⁸ Geotechnical Feasibility Investigation for the Proposed Commercial Development, Roadways and Railroad Alignment in Area "A", Honeywell Property, 850 South Sepulveda Boulevard, El Segundo, California, prepared by Albus-Keefe & Associates, Inc. dated May 20, 2003.

Figure IV.E-1 Boring Location Map

Faults

The numerous faults in Southern California include active, potentially active, and inactive faults. The criteria for these major groups are based on criteria developed by the California Geological Survey (formerly the California Division of Mines and Geology) for the Alquist-Priolo Earthquake Fault Zoning Program. By definition, an active fault is one that has had surface displacement within Holocene time (about the last 11,000 years). A potentially active fault is a fault that has demonstrated surface displacement of Quaternary age deposits (within the last 1.6 million years). Inactive faults have not moved in the last 1.6 million years.

Active Faults

Newport-Inglewood Fault

The nearest active fault to the Sepulveda/Rosecrans Rezoning Site is the Inglewood fault of the Newport-Inglewood fault zone located approximately 3.2 miles to the north-northeast. Segments of this fault zone, approximately 4 miles east of the City of El Segundo (City), trend southeastward from near Santa Monica across the Los Angeles Basin to Newport Beach.⁹ Movement along the southern segments of this fault zone produced the 1933 Long Beach earthquake with a Richter Magnitude 6.3. Numerous smaller earthquakes have been recorded along various segments of this fault zone. The maximum expected earthquake from this fault is a 7.0 Richter Magnitude. The approximate fault locations are depicted in Figure IV.E-2.

Cucamonga Fault

This fault zone, located approximately 18 miles northeast of the Sepulveda/Rosecrans Rezoning Site, consists of two or three sub-parallel strands in a zone 1 mile wide.¹⁰ It trends east-west for about 25 miles ending abruptly at the San Jacinto fault system. The maximum expected earthquake is a 6.5 Richter Magnitude.

Whittier-Elsinore Fault

The Whittier fault trace consists of a number of sub-parallel strands in a zone 1.5 to 2.5 miles wide. The zone stretches from approximately 2 miles north of Whittier and continues southeasterly along the southern base of Puente Hills through Temescal Valley where it merges with the Elsinore fault trace through Lake Elsinore.¹¹ Its total length exceeds 100 miles. The Whittier section forms the northeastern boundary of central block of the Los Angeles Basin. The trace is about 18 miles east of the City. The maximum expected earthquake from this fault zone is a 7.5 Richter Magnitude.

¹¹ Ibid.

⁹ City of El Segundo General Plan Draft Environmental Impact Report, December 1991.

¹⁰ Ibid.

Figure IV.E-2 Major Regional Faults

San Jacinto Fault

The San Jacinto fault trace, about 40 miles north of the Sepulveda/Rosecrans Rezoning Site, is at least 100 miles long. It trends northwesterly, parallel to the Whittier-Elsinore fault zone.¹² The southern section has been active with numerous small quakes (Claremont, 1918 and 1923; Casa Loma, 1939; Glen, 1899 and 1907). The California Geological Survey estimates that the maximum probable earthquake expected from this fault zone is a 7.5 Richter Magnitude.

San Andreas Fault

The active San Andreas fault zone is located about 45 miles northeast of the Sepulveda/Rosecrans Rezoning Site. This fault is the dominant active fault in California. It is the principal surface boundary between the Pacific and the North American plates and borders the San Gabriel Mountains on the northeast and the southern edge of San Bernardino Mountains.¹³ The 1857 Tejon earthquake with a Richter Magnitude of 8.25 was the most recent earthquake along this portion of this fault. The maximum expected earthquake from this fault zone is an 8.25 Richter Magnitude.

Blind Thrust Faults

Compton-Los Alamitos Thrust

The Compton-Los Alamitos Thrust is an inferred blind thrust fault located within the south-central portion of the Los Angeles Basin.¹⁴ The closest edge of the vertical surface projection of the buried thrust fault is located approximately 0.5 miles southeast of the Sepulveda/Rosecrans Rezoning Site. Like other blind thrust faults in the Los Angeles area, the Compton-Los Alamitos Thrust is not exposed at the surface and does not present a potential surface rupture hazard; however, the Compton-Los Alamitos Thrust should be considered an active feature capable of generating future earthquakes.

Elysian Park Thrust

The Elysian Park Thrust, originally defined by Hauksson¹⁵ as the Elysian Park Fold and Thrust Belt, was postulated to extend northwesterly from the Santa Ana Mountains to the Santa Monica Mountains, extending westerly and paralleling the Santa Monica-Hollywood and Malibu Coast faults. The Elysian Park Thrust is now believed to be smaller in size, only underlying the central Los Angeles Basin¹⁶. The Elysian Park Thrust, projected vertically to the ground surface, is approximately 11 miles northeast of

¹⁶ Ibid.

¹² Ibid.

¹³ Ibid.

¹⁴ Final Environmental Impact Statement/Final Environmental Impact Report Los Angeles Air Force Base Land Conveyance, Construction and Development Project, July 2003.

¹⁵ Ibid.

the Sepulveda/Rosecrans Rezoning Site. Like other blind thrust faults in the Los Angeles area, the Elysian Park Thrust is not exposed at the surface and does not present a potential surface rupture hazard; however, the Elysian Park Thrust should be considered an active feature capable of generating future earthquakes.

Northridge Thrust

The Northridge Thrust is an inferred blind thrust fault that is considered the eastern extension of the Oak Ridge fault.¹⁷ The Northridge Thrust underlies the majority of the San Fernando Valley and is believed to be the causative fault of the January 17, 1994 Northridge earthquake. The closest edge of the vertical surface projection of the Northridge Thrust is approximately 15¹/₂ miles northwest of the Sepulveda/Rosecrans Rezoning Site. This thrust fault is not exposed at the surface and does not present a potential surface fault rupture hazard. However, the Northridge Thrust is an active feature that can generate future earthquakes.

Potentially Active Faults

San Fernando Fault

This east-west trending fault zone approximately 26 miles in length, traverses the northern margins of the San Fernando Valley 10 miles to the north.¹⁸ Localized ground rupture occurred along this fault during the San Fernando (Sylmar) earthquake of 1971 with a Richter Magnitude 6.6. It is possible than an event larger than this quake may have occurred along this fault in the past 300 years.

Sierra Madre Fault

Located approximately 20 miles northeast of the Sepulveda/Rosecrans Rezoning Site, this fault follows the southern border of the San Gabriel Mountains for approximately 40 miles.¹⁹ This fault, the Santa Susana and San Fernando fault zones are closely linked segments of the same system. Evidence indicates that it is connected to the Whitter fault system on the east. Historical evidence suggests that earthquakes occurred along this fault in 1769 with an estimated Richter Magnitude 7.0 and in 1892 an estimated Richter Magnitude 6.0 to 7.0.

Verdugo Fault

This northwest-trending fault zone, approximately 16 miles northeast of the Sepulveda/Rosecrans Rezoning Site, lies at the southwest boundary of the Verdugo Mountains. Scattered small earthquakes have occurred near the trace, but identified offset occurred during Holocene time.

¹⁷ *Ibid.*

¹⁸ City of El Segundo General Plan Draft Environmental Impact Report, December 1991.

¹⁹ Ibid.

Malibu Coast-Santa Monica-Hollywood Fault

The City of El Segundo is situated near the juncture of two important faults, the Santa Monica Fault Zone, containing the Malibu Coast/Santa Monica/Raymond/Sierra Madre/Cucamonga fault zone and the Newport-Inglewood fault. The Santa Monica segment of the Santa Monica fault is buried from Las Flores Canyon to South Pasadena; however, it appears to roughly parallel the base of the Santa Monica Mountains forming the southern limit of the Transverse Ranges.²⁰ The Newport-Inglewood fault terminates northwest of the City in the vicinity of Beverly Hills. The Santa Monica fault is considered to be "potentially" active; its western section (Potrero Canyon fault) is known to displace late Pleistocene age deposits (approximately 120,000 years old) northwest of the City at Potrero Canyon in Santa Monica.

Palos Verdes Fault

South of the Inglewood section of the Newport-Inglewood fault and parallel to it are two Quatemary faults: the Palos Verdes and the Cabrillo faults.²¹ They consist of several echelon strands that have been traced from Redondo Beach to San Pedro. They disappear offshore and are considered to join the Newport-Inglewood fault.

Methane

There are three active oil fields, Hyperion, El Segundo and Lawndale, located within and adjacent to the City of El Segundo. The El Segundo Oil Field underlies the City of El Segundo, including the Sepulveda/Rosecrans Rezoning Site. Between 1935 and 1987, seventy-six wells were drilled in this field and it produced over 13.6 million barrels of oil. No natural gas or oil wells are known to have existed on the Sepulveda/Rosecrans Rezoning Site. Based on available maps, the nearest wells associated with oil or natural gas production are located northeast of the Sepulveda/Rosecrans Rezoning Site and an oil reservoir was located south of the Sepulveda/Rosecrans Rezoning Site across Rosecrans Avenue. The approximate oil well locations are depicted in Figure IV.E-3.

One of the most common sources of human-related methane comes from natural gas and petroleum systems/production.²² Since the Sepulveda/Rosecrans Rezoning Site is located in close proximity to natural gas and petroleum production areas (e.g., Chevron), the potential exists for methane to be found on the Sepulveda/Rosecrans Rezoning Site.

²⁰ Ibid.

²¹ Ibid.

²² www.epa.gov/methane/, July 1, 2004.

Figure IV.E-3 Oil Well Location Map

Methane is explosive at concentrations between 5.3 and 14 percent. Above 14 percent, methane is flammable but not explosive. At the present time, the majority of the remaining active wells are located in the Smoky Hollow and the Refinery areas. Oil reserves occupy most of the southeastern quadrant of the City. Due to the former presence of oil and natural gas production wells near the Sepulveda/Rosecrans Rezoning Site it is possible that methane may be present in the soil.

Geologic-Seismic Hazards

Surface Fault Rupture

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. The purpose of the Act is to prevent construction of buildings used for human occupancy on the surface trace of faults.

The City of El Segundo does not contain any Alquist-Priolo Earthquake Fault Zones. Therefore the Sepulveda/Rosecrans Rezoning Site is not within an established Alquist-Priolo Earthquake Fault Zone for surface fault rupture hazards. The closest Alquist-Priolo Earthquake Fault Zone, established for the Inglewood fault, is located approximately 3.2 miles to the north-northeast. Based on the available geologic data, active or potentially active faults with the potential for surface fault rupture are not known to be located directly beneath or projecting toward the Sepulveda/Rosecrans Rezoning Site. Therefore, the potential for surface rupture due to fault plane displacement propagating to the surface at the Sepulveda/Rosecrans Rezoning Site during the design life of the buildings is considered low.

Seismicity

Earthquake Catalog Data

The seismicity of the region surrounding the Sepulveda/Rosecrans Rezoning Site was determined from research of a computer catalog of seismic data.²³ This database includes earthquake data compiled by the California Institute of Technology for 1932 to 2002. Data from 1812 to 1931 compiled by Richter and the U.S. National Oceanic Atmospheric Administration (NOAA) was also utilized. The search for earthquakes that occurred within 100 kilometers of the Sepulveda/Rosecrans Rezoning Site indicates that 400 earthquakes of Richter magnitude 4.0 and greater occurred between 1932 and 2002.

Historic Earthquakes

A number of earthquakes of moderate to major magnitude have occurred in the Southern California area within the last 69 years. A partial list of these earthquakes is included in the Table IV.E-1.

²³ Southern California Seismographic Network, 2002, "Southern California Earthquake Catalog," http://www.scecdc.scec.org/ftp/catalogs/SCSN/.

Earthquake		
Youngest)	Date of Earthquake	Magnitude
Long Beach	March 10, 1933	6.4
Tehachapi	July 21, 1952	7.5
San Fernando	February 9, 1971	6.6
Whittier Narrows	October 1, 1987	5.9
Sierra Madre	June 28, 1991	5.8
Landers	June 28, 1992	7.3
Big Bear	June 28, 1992	6.4
Northridge	January 17, 1994	6.7
Hector Mine	October 16, 1999	7.1

Table IV.E-1 List of Historic Earthquakes

Liquefaction

Liquefaction is the process in which loose granular soils below the groundwater table temporarily lose strength during strong ground shaking as a consequence of increased pore pressure and thereby, reduced effective stress. The vast majority of liquefaction hazards are associated with sandy soils and silty soils of low plasticity. Potentially liquefiable soils (based on composition) must be saturated or nearly saturated to be susceptible to liquefaction.

Significant factors that affect liquefaction include water level, soil type, particle size and gradation, relative density, confining pressure, intensity of shaking, and duration of shaking. Liquefaction potential has been found to be the greatest where the groundwater level is shallow and submerged loose, fine sands occur within a depth of about 50 feet or less. Liquefaction potential decreases with increasing grain size and clay and gravel content, but increases as the ground acceleration and duration of shaking increase.

According to the State of California Seismic Hazard Zones Map, Venice Quadrangle, the Sepulveda/Rosecrans Rezoning Site is not in an area of the City of El Segundo with a high liquefaction potential (Figure IV.E-4, Liquefaction Potential).

Numerous environmental investigations have been conducted on the Sepulveda/Rosecrans Rezoning Site where groundwater wells were installed. Groundwater was encountered during these previous environmental investigations at depths ranging from approximately 71 to 77 feet below the existing ground surface. In general, liquefaction potential is primarily dependant upon soil engineering properties, ground shaking and groundwater conditions beneath the site. Current guidelines for evaluation of liquefaction potential require groundwater to be within 50 feet of the ground surface in

Figure IV.E-4, Liquefaction Potential

order for liquefaction to occur or create adverse impacts to structures. Based on the summary of groundwater conditions, the potential for liquefaction beneath the Sepulveda/Rosecrans Rezoning Site is considered remote.²⁴

Slope Stability

The Sepulveda/Rosecrans Rezoning Site is relatively flat, with small hills and depression areas scattered throughout. On the Sepulveda/Rosecrans Rezoning Site, there are 5 unlined natural depressions. Unlined depressions 1, 2 and 3 are located on the Plaza El Segundo portion of the site. Unlined depressions 4 and 5 are located on the remaining portion of the Sepulveda/Rosecrans Rezoning Site and are bounded by ascending railroad embankments to the north and south and surrounded by chain link fencing at the base of the embankments on all sides. The railroad easements are positioned on elevated embankments that descend toward unlined depression areas at a gradient of approximately 2:1 (horizontal to vertical) or flatter. The surface elevations of the Sepulveda/Rosecrans Rezoning Site range from 90 feet to 150 feet above mean sea level (MSL).

According to the County of Los Angeles Seismic Safety Element (1990) and the City of El Segundo General Plan (1992), the Sepulveda/Rosecrans Rezoning Site is not within an area identified as having a potential for slope instability. Additionally, the site is not located within an area identified as having a potential for seismic slope instability. There are no known landslides near the Sepulveda/Rosecrans Rezoning Site, nor is the Sepulveda/Rosecrans Rezoning Site located in the path of any known or potential landslides.

Subsidence

Subsidence is the downward settling of surface materials caused by natural or artificial removal of underlying support. According to the City of El Segundo General Plan (1992), no subsidence associated with fluid withdrawal (groundwater or petroleum), peat oxidation, or hydrocompaction has occurred in the City of El Segundo. Therefore, the Sepulveda/Rosecrans Rezoning Site is not within an area of known subsidence associated with fluid withdrawal, peat oxidation, or hydrocompaction.

Expansive Soils

According to the City of El Segundo General Plan (1992), the City of El Segundo is not within an area of known expansive soils. Therefore, the Sepulveda/Rosecrans Rezoning Site is not within an area of known expansive soils.

²⁴ Summary of Liquefaction Potential, Proposed Commercial Development Area "A", Honeywell Property, 850 South Sepulveda Boulevard, El Segundo, California, prepared by Albus-Keefe & Associates, Inc. dated December 2003.

ENVIRONMENTAL IMPACTS

Threshold of Significance

In accordance with guidance provided in Appendix G of the State CEQA Guidelines, the proposed Sepulveda/Rosecrans Site Rezoning and Plaza El Segundo Development could have a potentially significant impact if it were to result in one or more of the following:

- a. Expose people or structures to potentially adverse effects, including the risk of loss, injury, or death involving:
 - i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Faulting Zone Map issued by the State Geologist for the area or based on other substantial evidence of a known fault;
 - ii. Strong seismic ground shaking;
 - iii. Seismic-related ground failure, including liquefaction; or
 - iv. Landslides.
- b. Result in substantial soil erosion or the loss of topsoil.
- c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on-or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse.
- d. Be located on expansive soil, as defined in the California Building Code (2001) creating substantial risks to life or property.

In addition, the proposed Sepulveda/Rosecrans Site Rezoning and Plaza El Segundo Development would have a significant impact if potentially hazardous levels of methane were identified on the Sepulveda/Rosecrans Rezoning Site.

Project Impacts

Sepulveda Rosecrans Site Rezoning

Surface Fault Rupture

No evidence of faulting was observed during the field investigation and no active faults cross the Sepulveda/Rosecrans Rezoning Site or are located in the immediate site vicinity. The City of El Segundo does not contain any Alquist-Priolo Earthquake Fault Zones. Therefore the Sepulveda/Rosecrans Rezoning Site is not located within an established Alquist-Priolo Earthquake Fault

Zone for surface fault rupture hazards. The closest Alquist-Priolo Earthquake Fault Zone, established for the Inglewood fault, is located approximately 3.2 miles to the north-northeast. Based on the available geologic data, active or potentially active faults with the potential for surface fault rupture are not known to be located directly beneath or projecting toward the Sepulveda/Rosecrans Rezoning Site. Therefore, development²⁵ of Sepulveda/Rosecrans Rezoning Site would not expose people to significant impacts related to surface fault rupture.

Seismicity and Ground Shaking

The Sepulveda/Rosecrans Rezoning Site is not located within an area identified by the California Division of Mines and Geology as having a potential for seismic slope instability (slope instability resulting from ground shaking). However, the Sepulveda/Rosecrans Rezoning Site is located within the Southern California region that is known for its seismic activity. Additionally, the location of the Sepulveda/Rosecrans Rezoning Site relative to known active or potentially active faults indicates that it could be subjected to significant ground shaking. The State of California Building Code with local amendments regulates the design of buildings to resist gravity forces, to minimize fire hazards and to resist forces generated by winds and major earthquakes. Construction of railroad facilities is subject to the requirements set forth by the State of California Building Code, with its local amendments, would ensure that potential seismic and ground shaking impacts associated with the development of the Sepulveda/Rosecrans Rezoning Site would be less than significant.

Liquefaction and Seismic Settlement

According to the State of California Seismic Hazards Map, the Sepulveda/Rosecrans Rezoning Site is not located in an area at risk for liquefaction. Based on the summary of groundwater conditions, the potential for liquefaction beneath the Sepulveda/Rosecrans Rezoning Site is considered remote.²⁶ Furthermore compliance with the State of California Building Code, with local amendments, which regulates the design of buildings and foundations, would further reduce liquefaction impacts on the Sepulveda/Rosecrans Rezoning Site. Therefore, development of the Sepulveda/Rosecrans Rezoning Site would not expose people to significant liquefaction impacts such as seismic settlement and differential compaction.

²⁵ For purposes of this analysis, "development" of the proposed Sepulveda/Rosecrans Rezoning Site would encompass construction and operation of any use permitted under the proposed C-4 zone, including commercial and related uses, industrial gas facilities, and RV storage, as well as roadway construction and railroad relocation. Continuation of the existing lumber distribution facility in its current location would not entail new construction and would not have any impacts within the scope of this analysis.

²⁶ Summary of Liquefaction Potential, Proposed Commercial Development Area "A", Honeywell Property, 850 South Sepulveda Boulevard, El Segundo, California, prepared by Albus-Keefe & Associates, Inc. dated December 2003.

Slope Stability

The Sepulveda/Rosecrans Rezoning Site is relatively level and the absence of nearby slopes precludes slope stability hazards. According to the County of Los Angeles Seismic Safety Element (1990) and the City of El Segundo General Plan (1992), the Sepulveda/Rosecrans Rezoning Site is not within an area identified as having a potential for slope instability. Additionally, the site is not located within an area identified as having a potential for seismic slope instability. There are no known landslides near the Sepulveda/Rosecrans Rezoning Site, nor is the Sepulveda/Rosecrans Rezoning Site located in the path of any known or potential landslides. Therefore, the development of Sepulveda/Rosecrans Rezoning Site would not result in or expose people to significant impacts related to slope stability.

Subsidence

According to the City of El Segundo General Plan (1992), no subsidence associated with fluid withdrawal, peat oxidation, or hydrocompaction has occurred in the City of El Segundo. Therefore, development of the Sepulveda/Rosecrans Rezoning Site would not result in or expose people to significant impacts related to subsidence.

Expansive Soils

According to the City of El Segundo General Plan (1992), the City of El Segundo is not within an area of known expansive soils. Therefore, the Sepulveda/Rosecrans Rezoning Site would not result in or expose people to significant impacts related to expansive soils.

The Proposed Circulation Element Update Draft EIR requires analysis of potential impacts related to expansive soils for later projects that would implement the proposed Circulation Element Update. The proposed connection of Park Place between Sepulveda Boulevard and Nash Street and connection of Park Place to Hughes Way via Allied Way through the Sepulveda/Rosecrans Rezoning Site would constitute a project that implements the Circulation Element Update policies. Based upon the analysis above, construction of this component of the proposed Circulation Element Update would not result in new effects related to expansive soils that were not examined in the Program EIR for the proposed Circulation Element Update.

Methane

The City of El Segundo is within an oil field and there are documented producing wells located near the Sepulveda/Rosecrans Rezoning Site. Due to the presence of oil and natural gas wells near the Sepulveda/Rosecrans Rezoning Site, there is a potential for methane to be present in the soil. Therefore, the potential exists for hazardous levels of methane to be present at the Sepulveda/Rosecrans Rezoning Site. Impacts associated with methane levels on the Sepulveda/Rosecrans Rezoning Site would be potentially significant, subject to the findings of project-specific subsequent environmental analysis described under Subsequent Environmental Documentation and Mitigation Measures, below.

Grading and Construction Considerations

Landform Alterations

According to the City of El Segundo General Plan (1992), there are no unique geologic features in the vicinity of the Sepulveda/Rosecrans Rezoning Site. Therefore, no unique geologic features would be modified or destroyed as a result of the development of the Sepulveda/Rosecrans Rezoning Site.

Foundations

Based on the results of previous geotechnical investigations, the fill soils on the Sepulveda/Rosecrans Rezoning Site consist primarily of poorly-graded sands and some silty sands. These materials are generally medium dense and damp to moist. The thickness of non-engineered fill is estimated to be less than three feet in the vicinity of CPT 2, 3, 4 and 7 and approximately 10 to 13 feet deep in the vicinity of CPT 1, 5, and 6. Debris is present within the fill located near CPT-5 and 6 at the depth of 7 to 12 feet and may include large particles of concrete or other resistant material.

Older dune sand is present underlying the artificial fill throughout the Sepulveda/Rosecrans Rezoning Site. This unit is generally characterized as poorly-graded sands and some silty sands with occasional finer-grained lenses up to 1 foot thick. These materials are generally medium dense to dense and moist.

Settlement can result from the weight of proposed fills and/or loads from foundations. Total settlement due to the weight of fills is estimated to be approximately 0.2 inches per foot of fill to 0.08 inches per foot of fill. Therefore, a fill of 20 feet is estimated to cause a total settlement of approximately 4 inches. Because the site soils are generally granular in nature, these settlements are anticipated to occur rapidly as the loads are applied. In addition, to these immediate settlements, fills and foundations will also undergo a long-term secondary settlement equal to 25 percent to 50 percent of the above values. This secondary settlement would begin shortly after loading and continue to occur over the following 50 years. This condition can be reduced by providing a compacted fill blanket (about 2 feet thick) below the footings to limit the total settlement to less than 1 inch.

Significant settlement is anticipated to occur where deeper fills are proposed over existing fill soils. However, such settlements are anticipated to occur over a relatively short period of time and therefore, can be readily accommodated by allowing a short delay in such areas before construction of overlying improvements. No significant settlement is anticipated in proposed fill areas that are underlain by older dune deposits.

The actual foundation design requirements will be determined during the design phase of the project. The proposed buildings shall be designed so that footings are supported in firm natural soils or properly compacted fill is extended into dense natural soils. The State of California Building Code, with local amendments, regulates the design of structures to resist gravity forces, to minimize fire hazards and to resist forces generated by winds and major earthquakes. Compliance with the State of California Building Code, with local amendments, would ensure that potential design impacts from the construction of the foundation of the buildings would less than significant.

Grading

It is anticipated that conventional earth-moving equipment will be used in excavating any existing fill soils on the site. The proposed ground surface modifications (i.e. cuts and fills) are not known at this time. However, any fill that is placed during grading, shall be placed in accordance with the El Segundo Grading Ordinance.

All vegetation, construction debris and deleterious materials would be removed from the site. Existing fill would be removed to a depth of 2 feet below the existing grade or 2 feet below the proposed footings, which ever is deeper. All existing fill soils would be removed and replaced as compacted fill within future commercial development areas or the structures can be supported by deep foundations bearing on competent older dune deposits.

All other proposed fill areas (where non-engineered fills are not present) would be scarified to a depth of 12 inches; moisture conditioned as necessary to achieve uniform moisture content slightly over optimum, and then re-compacted to at least 90 percent of the laboratory standard.

All removals shall be evaluated by the geotechnical consultant during grading to confirm the exposed conditions are as anticipated. Following removals, the exposed grade would be scarified to a depth of 6 inches, moisture conditioned as necessary to achieve uniform moisture content slightly over optimum, and then re-compacted to at least 90 percent of the laboratory standard. Grading is not anticipated to have a significant impact on the Sepulveda/Rosecrans Rezoning Site Development or the surrounding developments.

Removal of contaminated soils that may occur on the Sepulveda/Rosecrans Rezoning Site would be separate activity which will be accomplished prior to grading activities. For a discussion of soil contamination on the Sepulveda/Rosecrans site and its removal, see Section IV.G of this EIR.

Erosion

The Sepulveda/Rosecrans Rezoning Site was previously developed with a variety of industrial and commercial manufacturing uses. These facilities are in various stages of demolition and remediation. Vegetation consists of a medium growth of weeds, bushes, ice plant, and other forms of vegetation. Minor fill materials and debris were also observed on the surface of the Sepulveda/Rosecrans Rezoning Site. On the Sepulveda/Rosecrans Rezoning Site, there are 5 unlined natural depressions. Earth movement activities in and around the unlined depressions could result in an increase of impervious surfaces at the site and expose soils to potential wind-borne erosion. Therefore, the potential for erosion as a result of the development of the Sepulveda/Rosecrans Rezoning Site would be significant.

There is also potential for erosion to occur during the grading process during periods of heavy precipitation. The development of the Sepulveda/Rosecrans Rezoning Site would result in potentially significant impacts related to water-borne erosion. A discussion of hydrology and drainage and associated impacts related to water-borne erosion can be found in Section IV.F, Hydrology and Water Quality.

Plaza El Segundo

As discussed in the preceding sections, development within the Sepulveda/Rosecrans Rezoning Site, which includes the proposed Plaza El Segundo Development site, would not expose people or structures to potentially adverse effects or otherwise result in significant impacts with respect to: surface fault rupture; seismicity and ground shaking; liquefaction and seismic settlement; slope stability; subsidence; expansive soils; landform alteration; building foundations; or grading. Impacts of the proposed Plaza El Segundo Development would be less than significant with respect to these issues.

Methane

The City of El Segundo is within an oil field and there are documented producing wells located near Plaza El Segundo. Therefore, the potential exists for significant levels of methane to be present on the Plaza El Segundo site. The analysis provided below regarding methane conditions within the Plaza El Segundo Development site is in accordance with the mitigation measures for the Sepulveda/Rosecrans Site Rezoning that require site specific evaluation of potential methane impacts and no further analysis of this issue beyond that set forth in the following paragraphs would be required for the proposed Plaza El Segundo Development. The analysis demonstrates that conditions related to underground methane would not result in new effects related to methane that were not examined in the Program EIR for the proposed Sepulveda/Rosecrans Site Rezoning.

A methane study was conducted to determine the presence or absence of methane on the Plaza El Segundo site. Seventeen methane samples and one duplicate sample were collected from nine locations on the Plaza El Segundo site on January 5, 2004. These locations and the depths of the samples are identified in Table IV.E-2 and depicted on Figure IV.E-5. The methane sampling was conducted in accordance with the *Methane Soil Gas Sampling Work Plan*²⁷. Activities implemented as part of the Work Plan were based on the guidelines presented in the California Department of Toxic Substances Control and the Los Angeles Regional Water Quality Control Board (DTSC/LARWQCB) guidance document entitled "Advisory-Active Soil Gas Investigations".²⁸

²⁷ Methane Soil Gas Sampling Work Plan, Honeywell El Segundo Site, 850 South Sepulveda Boulevard, El Segundo, California, Honeywell, December 19 2003.

²⁸ Memorandum from Aaron D. Svitana to Dan Gillette regarding Honeywell International, Inc. El Segundo, CA Site – Methane Sampling Summary, February 6, 2004.

Sampling Location ID	Figure ID	Sample Interval (ft bgs)		
SDG-B13	1D	20 and 60		
SDG-L15-A4	6D	5		
SDG-I07	9D	20 and 60		
SDG-A07-D2	20D	20 and 60		
AS-MW-18	AS-MW-18	25 and 75		
SDG-F06-C	23D	20 and 60		
VEW-8	VEW-8	40 and 60		
VEW-14	VEW-14	40 and 60		
AS-MW-17	AS-MW-17	25 and 70		
ft bgs = feet below ground surface				
Source: Memorandum from Aaron D. Svitana to Dan Gillette regarding Honeywell International, Inc. El				
Segundo, CA Site – Methane Sampling Summary, February 6, 2004.				

Table IV.E-2Methane Gas Sampling Locations

The practical quantitation limit (PQL) for methane is 100 parts per million (ppm). As shown in Table IV.E-3, methane was detected above the PQL in a total three samples taken at two different locations. These locations were identified as SDG-F06-C and SDG-I07. The highest concentration dectected was 536 ppm. However, based on DTSC/LARWQCB guidance, additional sampling and further sampling are recommended only when the concentrations reach the 1,000 ppm threshold. As the table shows, none of the samples approach the 1,000 ppm threshold and therefore, no further sampling and analysis is required. Impacts associated with methane would be less than significant on the Plaza El Segundo site.²⁹

Erosion

Plaza El Segundo was previously developed with a variety of industrial and commercial manufacturing uses. These facilities are in various stages of demolition and remediation. Vegetation consists of a medium growth of weeds, bushes, ice plant, and other forms of vegetation. Minor fill materials and debris were also observed on the surface of the Sepulveda/Rosecrans Rezoning Site. On the Sepulveda/Rosecrans Rezoning Site, there are 5 unlined natural depressions. Unlined depressions 1, 2 and 3 are located on the Plaza El Segundo site. Unlined natural depressions could result in an increase of impervious surfaces at the site and expose soils to the effects of wind-borne erosion. Therefore, the potential for erosion at the site as a result of the development of Plaza El Segundo would be significant. There is also potential for erosion to occur during the grading process during periods of heavy precipitation. The development of Plaza El Segundo would result in potentially significant impacts related to erosion. A discussion of hydrology and drainage impacts and associated impacts related to water-borne erosion can be found in Section IV.F, Hydrology and Water Quality.

²⁹ Ibid.

Figure IV.E-5, Methane Sampling Locations for Plaza El Segundo

Sample ID	Location ID	Depth	Results	
SGD-B13-20'-METH	SBD-B13	20	< 100	
SGD-B13-60'-METH	SGD-B13	60	< 100	
SGD-A07-C2-20'-METH	SGD-A07-C2	20	< 100	
SGD-A07-C2-60'-METH	SGD-A07-C2	60	< 100	
SGD-F06-C-20'-METH	SGD-F06-C	20	485	
SGD-F06-C-20'-METH-DUP	SGD-F06-C	20	484	
SGD-F06-C-60'-METH	SGD-F06-C	60	< 100	
SGD-I07-20'-METH	SGD-I07	20	< 100	
SGD-I07-60'-METH	SGD-I07	60	536	
SGD-L15-A4-5'-METH	SGD-L15-A4	5	< 100	
AS-MW-18-70'-METH	AS-MW-18	70	< 100	
AS-MW-18-25'-METH	AS-MW-18	25	< 100	
AS-MW-17-70'-METH	AS-MW-17	70	< 100	
AS-MW-17-25'-METH	AS-MW-17	25	< 100	
VEW-14-60'-METH	VEW-14	60	< 100	
VEW-14-40'-METH	VEW-14	40	< 100	
VEW-8-40'-METH	VEW-8	40	< 100	
VEW-8-60'-METH	VEW-8	60	< 100	
Source: Memorandum from Aaron D. Svitana to Dan Gillette regarding Honeywell International, Inc. El Segundo,				
CA Site – Methane Sampling Summary, February 6, 2004				

Table IV.E-3 Methane Sampling Results

CUMULATIVE IMPACTS

Sepulveda Rosecrans Site Rezoning - 2012

Development of the proposed Sepulveda/Rosecrans Rezoning Site in conjunction with the related projects listed in Section III.B would result in further "infilling" of various land uses in the City of El Segundo. Geotechnical hazards are site-specific and there is little, if any, cumulative relationship between development of the proposed Sepulveda/Rosecrans Rezoning Site and the related projects. As such, construction of the related projects is not anticipated to combine with the proposed development of the Sepulveda/Rosecrans Rezoning Site to cumulatively expose people or structures to such geologic hazards as earthquakes, ground shaking, liquefaction, landslides and/or unstable soils, expansive soils, or result in substantial soil erosion or the loss of topsoil. Therefore, no cumulatively considerable geological impacts are anticipated from the development of the proposed Sepulveda/Rosecrans Rezoning Site and the related projects.

Plaza El Segundo - 2007

Development of Plaza El Segundo in conjunction with the related projects listed in Section III.B would result in further "infilling" of various land uses in the City of El Segundo. Geotechnical hazards are

site-specific and there is little, if any, cumulative relationship between development of Plaza El Segundo and the related projects. As such, construction of the related projects is not anticipated to combine with the Plaza El Segundo to cumulatively expose people or structures to such geologic hazards as earthquakes, ground shaking, liquefaction, landslides and/or unstable soils, expansive soils, or result in substantial soil erosion or the loss of topsoil. Therefore, no cumulatively considerable geological impacts are anticipated from the Plaza El Segundo Development and the related projects.

SUBSEQUENT ENVIRONMENTAL DOCUMENTATION

Sepulveda/Rosecrans Site Rezoning

Subsequent environmental documentations must be prepared for any proposed development on the Sepulveda/Rosecrans Rezoning Site to determine the presence or absence of methane. The subsequent environmental documentation must address the following:

E-1 A methane study must be conducted to determine the levels at which methane is or is not present in the area of any proposed development. If methane is determined to be present at or above levels which require action, then the report must include recommendations and mitigation measures which must be followed.

Plaza El Segundo

No subsequent environmental documentation is required for the Plaza El Segundo Development, as a methane report has already been prepared and it has been determined that methane is not present at levels which would require action. This report³⁰ meets the requirement for subsequent environmental documentation and mitigation measures established for methane.

MITIGATION MEASURES

Sepulveda/Rosecrans Rezoning Site

The following mitigation measures must be implemented to reduce potentially significant geotechnical impacts and must apply to any development on the Sepulveda/Rosecrans Rezoning Site.

E-1 A methane study must be conducted to determine the levels at which methane is or is not present in the area of any proposed development. If methane is determined to be present at or above levels which require action, then the report must include recommendations and mitigation measures which must be followed.

³⁰ Memorandum from Aaron D. Svitana to Dan Gillette regarding Honeywell International, Inc. El Segundo, CA Site – Methane Sampling Summary, February 6, 2004

E-2 All soil disturbance and travel on unpaved surfaces must be suspended if winds exceed 25 miles per hour.

Plaza El Segundo Development

The following mitigation measure must specifically apply to the proposed Plaza El Segundo Development.

E-3 All soil disturbance and travel on unpaved surfaces must be suspended if winds exceed 25 miles per hour.

LEVEL OF IMPACT AFTER MITIGATION

Sepulveda/Rosecrans Site Rezoning

With the exception of erosion and methane impacts, all geotechnical and seismic impacts would be less than significant. With implementation of the mitigation measures listed, erosion and methane impacts would be less than significant.

Plaza El Segundo

With the exception of erosion impacts, all geotechnical and seismic impacts would be less than significant. With the implementation of the mitigation measure provided impacts associated with soil erosion would be less than significant.