TABLE 3.2-4: CONSTRUCTION EQUIPMENT AND WORKERS NEEDED

Construction Phase	Duration (days)	At Peak of Construction Phase Equipment		Workers
Excavation	150	Large Scrapers – 5 Large Cranes – 2 Large Backhoe – 1 Hydro-Vibro Drivers – 2 Small Cranes – 2 Small Loaders – 2 Motor Grader – 1 Medium Trucks – 2 Light Trucks – 4 Welding Machines – 2	Large Dozers – 2 Large Forklifts – 2 Drill Rigs - 2 Grout Pumps – 2 Small Backhoe –1 Water Trucks – 2 Dump Trucks - 4 Gang Trucks - 2 Compactor - 1	35 - 45
Construction & Installation	1,050	150 Ton Crane - 2 Rough Terrain Crane - 2 Forklift - 2	Concrete Pump - 1 Flat Rack Truck -1 Air Compressor - 3	35 - 60
Connection	430	Large Loaders – 2 Large Backhoe – 1 Medium Crane – 1 Medium Forklift – 1 Hydro-Vibro Drivers – 1 Small Backhoe –1 Dump Trucks – 4 Gang Trucks – 2 Welding Machines – 2	Large Cranes – 1 Medium Dozers – 2 Medium Loader - 1 Drill Rig - 1 Water Trucks – 2 Medium Trucks – 2 Light Trucks – 3 Compactors - 4	40 - 60

Source: Carollo Engineers, 2003

TABLE 3.2-5: OCSD HEADWORKS PROJECT CONSTRUCTION EMISSIONS (LBS/DAY)

Air Pollutant	Excavation, Grading & Soil Removal	Construction	Connection	Significance Criteria
CO	85.41	50.76	56.01	550
ROC	28.52	11.97	14.39	75
NO_x	493.04	178.51	212.09	100
PM_{10}	122.10	8.35	28.36	150

Source: ESA 2003, SCAQMD.
Air calculation worksheets are included in Appendix E.

As indicated in Table 3.2-5, NO_x emissions associated with the three major phases of construction would exceed SCAQMD significance thresholds. Mitigation measures identified in the PEIR would be applicable to the project. The additional mitigation measure provided below would assist in minimizing PM_{10} emissions during soil hauling activities. Nevertheless, due to the large number of heavy equipment required to construct the headworks facilities, construction emissions would exceed SCAQMD significance thresholds, and therefore would constitute a significant unavoidable impact to air quality. This would be a short-term impact.

Mitigation Measures

M-3.2-1: Soil removal contractors shall cover all trucks hauling soil, sand, and other loose materials, or maintain at least two feet of freeboard.

Significance after Mitigation

Significant and unavoidable.

Impact 3.2-2: Operation of the proposed project would emit criteria pollutants. Estimated daily average emissions would not exceed significance thresholds set by the SCAQMD. Implementation of the proposed project would not violate air quality standards.

Operational emissions would include stationary and mobile source emissions. Stationary sources would include emissions associated with power generation. The new facility would increase electricity use over existing conditions largely due to the power needed for the new odor control facilities. It is estimated that electricity consumption would increase by approximately 3.3 mega watts (MW) per hour, from 23.4 MW to 26.7 MW, as a result of the project. This constitutes a 14% increase over present conditions. The onsite cogeneration facilities would accommodate this increase during normal operating conditions and only require supplemental power from Southern California Edison during peak wet weather when demands are increased, which is the same scenario as current operating conditions. The change in operational procedures of the power generating equipment, and the new odor control facilities would require permits to operate from the SCAQMD. As part of the project, prior to construction, the District would obtain a revision to its Title V permit from the SCAQMD covering stationary sources.

Mobile sources of emissions associated with operation of the new headworks include chemical delivery trucks and grit and screenings haul trucks. It is estimated that the project would increase chemical deliveries by 416 trips per year (1 to 2 trips per day). It is further estimated that the new headworks would reduce grit and screenings haul trips from the facility by 180 trips per year. Assuming that each trip would average 35 miles one way, the project would increase annual vehicle miles traveled by 8,260 miles per year (32 miles per day). This would be considered a minor increase and would not cause a significant change in emissions from mobile emissions. Table 3.2-6 summarizes the increase in daily haul truck emissions associated with the proposed project. No mitigation would be required.

Mitigation Measures

No mitigation measures are required.

TABLE 3.2-6: OPERATIONAL EMISSIONS INCREASE FROM EXISTING EMISSIONS (LBS/DAY)

Air Pollutant	Mobile Sources	Significance Criteria
CO	0.89	550
ROC	0.20	55
NO_x	4.92	55
PM_{10}	0.21	150

Source: ESA 2003, SCAQMD.
Air calculation worksheets are included in Appendix E.

Significance after Mitigation

Less than significant.

Impact 3.2-3: The proposed project is not anticipated to result in objectionable odors affecting a substantial number of people.

As part of the project, a new headworks odor control facility would be constructed that would substantially improve the existing odor control equipment. This would be considered a beneficial impact of the project. The District has prepared an Odor Control Master Plan for the entire treatment plant that will implement new odor control technologies. The new headworks odor control facility is a key part of this new Master Plan.

During construction, the project could generate odors temporarily as the trunk lines and pump station wetwells are disconnected and reconnected with the new headworks. These activities would be temporary. Implementation of the following mitigation measures would ensure that construction would not pose a nuisance to neighboring residents.

Mitigation Measures

M-3.2-2: The District shall ensure that contractors immediately remove salvaged/demolished equipment from Plant No. 2 to minimize potential odors during the removal of existing facilities. Staging areas shall not be used to store salvaged/demolished equipment.

Significance after Mitigation

Less than significant.

3.3 GEOLOGY AND SOILS

This section evaluates whether the proposed project would impact local geological features or expose people or structures to adverse geological impacts. Potential geologic hazards include seismically induced groundshaking, fault rupture, liquefaction, landslides, and weak or unstable soil conditions.

3.3.1 SETTING

Regional

The site is located on the Orange County coastal plain, which is essentially a basin where rocks and alluvium were deposited and where differential subsidence and uplifting have continued to occur since the late Cretaceous period (135 million to 65 million years ago). The basin became a low relief surface through a history of differential sinking, uplifting, folding faulting, erosion, and deposition. Soils within the area are characteristic of the Southern California coastal plain, consisting of alluvial deposits and floodplain soils.

The geologic substructure is subject to considerable tectonic stress and numerous faults traverse the region. The Newport-Inglewood fault zone is the major structural feature of the coastal area. Folding and faulting along this zone have displaced all rocks older than the alluvial and littoral deposits of the Holocene period (the past 11,000 years), thereby creating a barrier to groundwater movement. The structural changes and subsequent erosion from the Santa Ana and San Gabriel Rivers have formed a series of coastal mesas.

Site

Treatment Plant No. 2 occupies a 110-acre triangular site in the southern corner of the City of Huntington Beach. It is bordered on the east by the SAR, on the northwest by Brookhurst Street, and on the southwest by Talbert Marsh. Huntington Beach State Park and PCH are located across the marsh. The site is located approximately 1,500 feet from the ocean. Within the plant site, existing treatment facilities occupy the southern two-thirds of the site, while the area to the northeast remains undeveloped.

The plant site, originally a peat bog, is underlain by silty sand and sandy soils. Past construction at the site has required extensive foundation work with cement "pillars" buried up to 15 feet for support under some structures. Sludge spreading areas, which occupy most of the open land at the site, have been distributed to a depth of four feet. Due to the site's close proximity to the ocean, groundwater is present at shallow depths.

In August 2002 and March 2003, Converse Consultants performed two geotechnical investigations to evaluate subsurface conditions and potential seismic hazards and provide engineering recommendations appropriate for site-specific conditions.[1] According to the geotechnical reports, the site is underlain by undocumented fill consisting of loose to medium dense silty sand, and soft to stiff silts and clays to depths of 20 feet below ground surface (bgs). From 20 to 60 feet bgs, alluvium consisting of medium dense to very dense sand and silty sands were encountered. A layer of interbedded stiff to hard silts and clays and

[1] Converse Consultants, *Final Geologic Hazards and Geotechnical Investigation Report Proposed Headworks Replacement P2-66,* August 15, 2002; and Converse Consultants, *Supplemental Geotechnical Investigation Report Proposed Headworks Replacement P2-66,* March 17, 2003.

dense sands were encountered between 60 to 80 feet bgs. Below 80 feet down to a depth of 85 to 99 feet, very dense sands, grading downward into the gravelly sands of the Talbert Aquifer in some locations, were encountered.

Seismology and Faults

Like much of Southern California, Treatment Plant No. 2 is located in a seismically active area that is subject to considerable tectonic stress. Figure 3.3-1 shows the location of regional faults. Treatment Plant No. 2 is located within the Newport-Inglewood Fault Zone. The fault zone consists of a series of short, discontinuous, northwest-trending right-lateral faults, relatively shallow anticlines, and subsidiary normal and reverse faults extending approximately 36 miles from the Santa Monica Mountains to offshore Newport Beach. A segment of the fault zone also extends from Newport Beach to about six miles southeast of San Onofre. Other major faults in the region include the Whittier Fault Zone and the Palos Verdes Fault.

The California Geological Society (CGS) has classified the Newport-Inglewood Fault Zone active[2] under the Alquist-Priolo Earthquake Fault Zoning Act.[3] Few specific geological studies have been conducted for the Newport-Inglewood Fault Zone, but historical records have shown potentially damaging earthquakes to occur every few years. The most damaging in the last 70 years was the 6.3 magnitude 1933 Long Beach quake. The Newport-Inglewood fault is capable of a maximum moment magnitude of 6.9.[4] The CGS has not established a fault hazard zone on the Newport-Inglewood Fault Zone in the area of Treatment Plant No. 2, as it has done along most of the onshore portion of the fault, because it could not find definitive evidence of active faulting within the 0.5-mile wide zone associated with the fault where it trends offshore.[5] This area near the plant is difficult to study for active faulting because historic flooding of the SAR has covered any traces of surface scarps that may have formed during previous fault movement and shallow groundwater impedes conventional fault investigation by trenching.

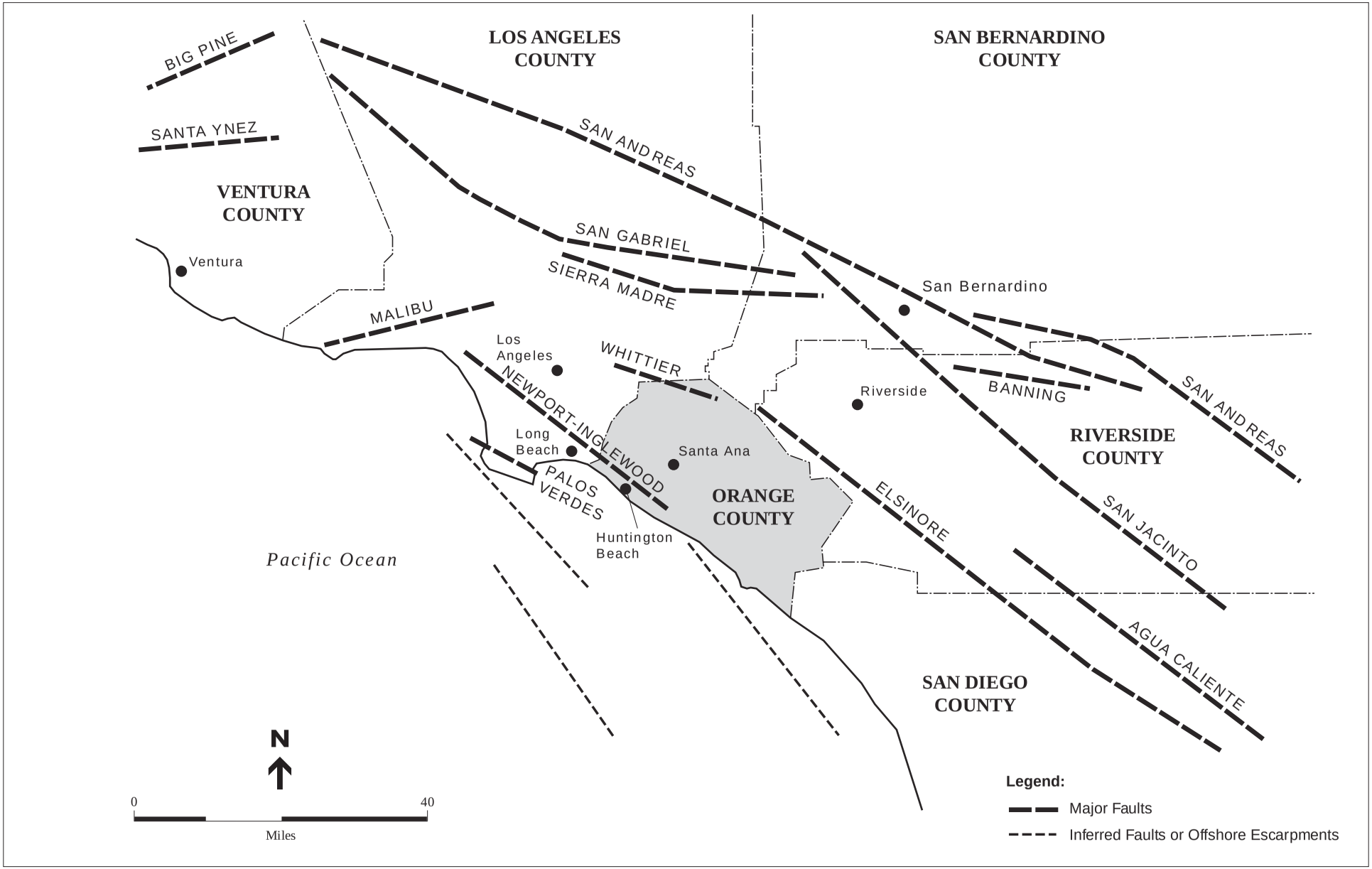
In 1994, Law/Crandall prepared a fault hazard study for the entire Treatment Plant No. 2 site. Multiple fault splays associated with the Newport-Inglewood Fault Zone were found to traverse the site. Each splay was assigned an activity level based on the most recent deformation associated with it. "High" activity splays are those associated with more recent displacement of Holocene-age materials, while "moderate" and "low" activity are associated with splays that offset Pleistocene or older sediments. Five high activity and one low activity fault were identified in the project vicinity. These fault splays are shown in Figure 3.3-2.

[2] An "active" fault is defined by CGS as one that has had surface displacement within the Holocene time (about the last 11,000 years).

[3] The purpose of this act is to prohibit the placement of most structures for human occupancy across traces of active faults and thereby mitigate the hazards of surface fault rupture.

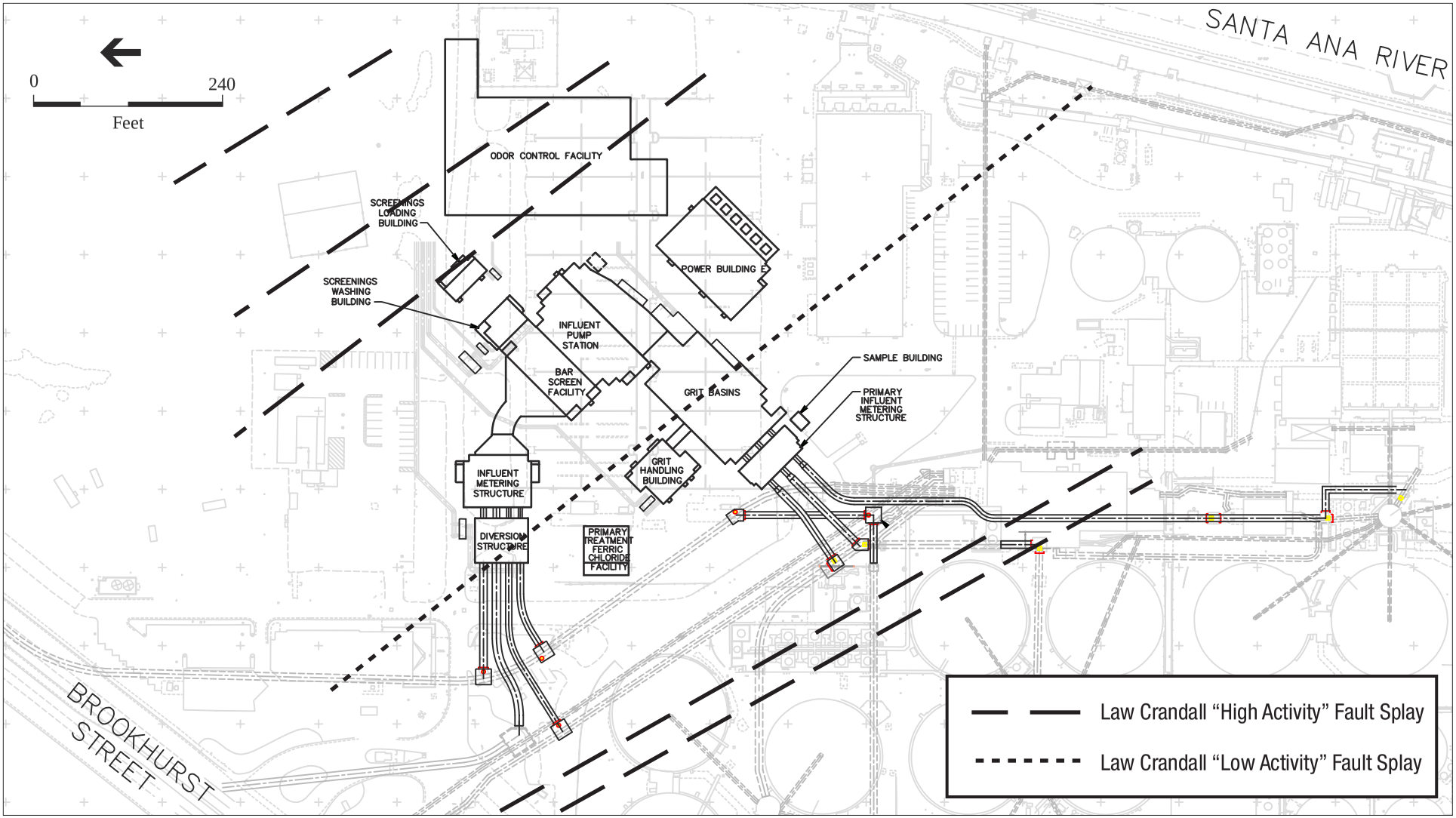
[4] The maximum moment magnitude is an estimate of the size of a characteristic earthquake capable of occurring on a particular fault. Moment magnitude is related to the physical size of a fault rupture and movement across a fault. Richter magnitude scale reflects the maximum amplitude of a particular type of seismic wave and can be generally higher than moment magnitude estimations.

[5] Converse Consultants, *Final Geologic Hazards and Geotechnical Investigation Report Proposed Headworks Replacement P2-66,* August 15, 2002.



SOURCE: Orange County Emergency Management Division

Figure 3.3-1
Regional Fault Zones



SOURCE: Orange County Sanitation District, May 2003
Converse Consultants, August 2002

Figure 3.3-2
Fault Splays Crossing Project Site

GEOLOGIC HAZARDS

Expansive soils

Expansive soils possess a "shrink-swell" behavior that occurs in fine-grained clay sediments from the process of wetting and drying, which may result in structural damage over a long period of time. The City of Huntington Beach General Plan indicates that the northern half of the Treatment Plant No. 2 site is located in an area of generally moderate to high soil expansion potential and the southern half of the site has a moderate potential for expansive soils.[6] The proposed project site is located on the portion of the site characterized as having moderate to high soil expansion potential. However, the geotechnical investigation for this project suggests that expansive soils will not pose a hazard for the proposed construction.

Settlement

Loose, soft soil material comprised of sand, silt, clay, and peat has the potential to settle after a building is placed on the surface. Settlement of the loose soils generally occurs slowly, but over time can damage structures. According to the City of Huntington Beach General Plan, the site location is not located in an area subject to settlement.[7] The geotechnical investigation for this project confirms the conclusion of the General Plan and settlement is not expected to be a problem for the proposed construction.

Subsidence

The extraction of water, mineral, or oil resources can result in subsidence from the removal of supporting layers in the geologic formation. Neighboring oil extraction activities could promote localized subsidence. The impacts of subsidence could include lowering of the land surfaces, increased potential for flooding, potential disturbance to buried pipeline and associated structures, and damage to structures designed with minimal tolerance for settlement. The project site is not located within an area that has been subject to subsidence.[8]

Landslides and Lateral Spreading

Soil type, climate, topography, slope geometry, and excavations can initiate slope failures and landslides. Shaking during an earthquake may lead to seismically induced landslides, especially in areas that have previously experienced landslides or slumps, in areas of steep slopes, or in saturated hillsides. Seismically induced lateral spreading involves lateral movement of earth materials due to ground shaking. It differs from slope failure in that complete ground failure involving large movement does not occur due to the relatively smaller gradient of the initial ground surface. Lateral spreading occurs as near-vertical cracks with predominantly horizontal movement of the soil mass involved.

[6] City of Huntington Beach General Plan, Environmental Hazards Element, December 12, 1995.

[7] *Ibid.*

[8] *Ibid.*

The CGS has prepared maps identifying Seismic Hazard Zones, which indicate areas prone to liquefaction and earthquake-induced landslides. According to CGS, there are no portions of the project site classified as earthquake-induced landslide hazard areas.[9]

Ground shaking

Shaking intensity can vary depending on the overall magnitude, distance to the fault, focus of earthquake energy, and type of geologic material underlying the area. Intensities generally are highest at the fault and decrease with distance from the fault. However, the composition of underlying soils in areas located relatively distant from faults can intensify ground shaking. Areas that are underlain by bedrock tend to experience less ground shaking than those underlain by unconsolidated sediments such as artificial fill.

Treatment Plant No. 2 is located near the active Newport-Inglewood Fault. Potentially damaging earthquakes have occurred every few years along this fault zone. In addition, there are several other active faults in the region, including the Whittier Fault Zone and the Palos Verdes Fault. Seismic activity on any of these faults could cause considerable ground shaking in the project area.

Ground shaking is commonly described in terms of peak ground acceleration as a fraction of the acceleration of gravity (g), or by using the Modified Mercalli Intensity Scale, a common intensity scale. The Modified Mercalli Intensity Scale is a more descriptive method involving 12 levels of intensity denoted by Roman numerals. Table 3.3-1 below provides intensity descriptions with the corresponding peak acceleration and velocity values used in CGS ShakeMaps. The degree of actual structural damage would not be uniform because not all buildings perform identically in an earthquake. The age, material, type, method of construction, size, and shape of a building all affect its performance.

TABLE 3.3-1: GROUND SHAKING INTENSITY DESCRIPTIONS

Instrumental Intensity[a]	Acceleration (% g)	Velocity (cm/s)	Perceived Shaking	Potential Damage
I	< 0.17	< 0.1	Not Felt	None
II – III	0.17 - 1.4	0.1 - 1.1	Weak	None
IV	1.4 - 3.9	1.1 - 3.4	Light	None
V	3.9 - 9.2	3.4 - 8.1	Moderate	Very light
VI	9.2 - 18	8.1 - 16	Strong	Light
VII	18 - 34	16 - 31	Very Strong	Moderate
VIII	34 - 65	31 - 60	Severe	Moderate to Heavy
IX	65 - 124	60 - 116	Violent	Heavy
X+	> 124	> 116	Extreme	Very Heavy

a. The "Instrumental Intensity" is the estimated Modified Mercalli Intensity based on instrumental ground motion recordings (peak acceleration and velocity) and observed intensity for eight significant California earthquakes (1971 San Fernando, 1979 Imperial Valley, 1986 North Palm Springs, 1987 Whittier, 1989 Loma Preita, 1991 Sierra Madre, 1992 Landers, and 1994 Northridge).

cm/s = centimeters per second.

Source: California Integrated Seismic Network, 2001.

[9] California Geological Survey website, accessed June 2, 2003, http://gmw.consrv.ca.gov/shmp/download/pdf/ozn_newb.pdf.

Surface fault rupture

Rupture of the surface during an earthquake is generally limited to the narrow strip of land immediately adjacent to the fault on which the earthquake is occurring. Surface fault rupture may occur suddenly during an earthquake or slowly in the form of fault creep and almost always follows pre-existing faults, which are zones of weakness. Not all earthquakes will result in surface rupture. No known CGS fault rupture zones exist within the project site.

Liquefaction ground failures

Liquefaction occurs when water-saturated sandy soil materials lose strength and become susceptible to failure during strong ground shaking in an earthquake. Liquefaction of sandy layers can also cause seismically induced settlement to occur. Liquefaction potential is greatest in areas with shallow groundwater and saturated soils. The CGS Seismic Hazard Zone Map for the area shows that the entire site is located within an area subject to liquefaction.[10] The City of Huntington Beach General Plan classifies the Treatment Plant No. 2 site as having high to very high liquefaction potential.[11]

APPLICABLE REGULATIONS

California Environmental Quality Act (CEQA)

CEQA defines a significant effect on the environment as a substantial, or potentially substantial, adverse change in the physical conditions within the area affected by the project. *CEQA Guidelines* lists several geology-related impacts that would normally be considered significant. These include exposing people or structures to major geologic (expansive soils, landslides) and seismic hazards (fault rupture, groundshaking, liquefaction); erosion or siltation; substantial changes in topography; adversely affecting unique geologic or topographic features; or inundation due to dam failure, seiche, or tsunami. For a project under CEQA review, potential adverse effects of a particular identifiable geologic or seismic hazard is analyzed to determine the overall impact to the environment. The conclusions drawn from the impact analysis provides the framework for identification and evaluation of feasible mitigation measures to reduce the intensity of the impact.

Alquist-Priolo Earthquake Fault Zones

The Alquist-Priolo Earthquake Fault Zoning Act of 1972 requires that special geologic studies be conducted to locate and assess any active fault traces in and around known active fault areas prior to development of structures for human occupancy. This state law was a direct result of the 1971 San Fernando Earthquake, which was associated with extensive surface fault ruptures that damaged numerous homes, commercial buildings, and other structures.

The Alquist-Priolo Act's main purpose is to prevent the construction of buildings used for human occupancy on the surface trace of active faults or within fifty feet of an active fault. The Act defines "a structure for human occupancy" as any structure expected to have a human occupancy rate of more than

[10] California Geological Survey website, accessed June 2, 2003, http://gmw.consrv.ca.gov/shmp/download/pdf/ozn_newb.pdf.

[11] City of Huntington Beach General Plan, Environmental Hazards Element, December 12, 1995.

2,000 person-hours per year. This Act only addresses the hazard of surface fault rupture and is not directed toward other earthquake hazards. The law requires the State Geologist to establish regulatory zones (Earthquake Fault Zones) around the surface traces of active faults and to issue appropriate maps. These maps (Alquist Priolo Maps) are distributed to all affected cities, counties and state agencies for their use in planning and controlling new or renewed construction. Local cities and counties must regulate certain development projects (i.e., land divisions and most structures for human occupancy) within the zones, which include withholding permits until geologic investigations demonstrate that development sites are not threatened by future surface displacement.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act of 1990 addresses non-surface fault rupture earthquake hazards, including liquefaction and seismically induced landslides. The purpose of the Act is to protect public safety from the effects of strong ground shaking, liquefaction, landslides, or other ground failure, and other hazards caused by earthquakes. This act requires the State Geologist to delineate various seismic hazard zones and requires cities, counties, and other local permitting agencies to regulate certain development projects with these zones. Seismic Hazard maps have been completed for much of the Southern California region.

California Building Code

The *California Building Code* (CBC) is certified in the California Code of Regulations (CCR), Title 24, Part 2, which is a portion of the California Building Standards Code. Title 24 is assigned to the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under state law, all building standards must be centralized in Title 24 or they are not enforceable. Published by the International Conference of Building Officials, the Uniform Building Code (UBC) is a widely adopted model building code in the United States. The CBC incorporates by reference the UBC with necessary California amendments. About one-third of the text within the CBC has been tailored for California earthquake conditions.

City of Huntington Beach General Plan and Environmental Hazards Element

Cities and county governments typically develop as part of the General Plans, safety and seismic elements that identify goals, objectives, and implementing actions to minimize the loss of life, property damage and disruption of goods and services from non-seismic geologic hazards and earthquakes. General Plans can provide policies and develop ordinances to ensure acceptable protection of people and structures from risks associated with these hazards. Ordinances can include those addressing unreinforced masonry construction, erosion, or grading.

3.3.2 IMPACTS AND MITIGATION

CRITERIA FOR DETERMINING SIGNIFICANCE

The proposed project may result in a significant impact if it would:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

  - Rupture of known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault. Refer to California Division of Mines and Geology Special Publication 42.

  - Strong seismic ground shaking.

  - Seismic-related ground failure, including liquefaction.

  - Landslides.

- Result in substantial soil erosion or the loss of topsoil;

- Be located on strata 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; or,

- Be located on expansive soil, as defined in Table 18-1-B of the UBC, creating substantial risks to life or property;

- Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.

Impact 3.3-1: The proposed project could expose people or structures to potential adverse effects due to rupture of a known earthquake fault, strong ground shaking, ground failure, including liquefaction and landslides due to seismic activity.

The proposed project site is situated in a seismically active region. The site is not located within an Alquist-Priolo Earthquake Surface Fault Rupture Zone. However several fault splays of the Newport-Inglewood fault are known to underlie the site, some of which have experienced displacement of Holocene sediments and therefore can be considered "active" by CGS criteria. A seismic event from one of these faults or other nearby or more distant faults could have the potential to damage structures on the site.

Converse Consultants analyzed potential geologic hazards from seismic activity and made the following conclusions:[12]

- *Surface Fault Rupture:* The site is not located in an Alquist-Priolo Act Surface Fault Rupture Hazard Zone identified by the CGS. Based on the geotechnical investigation, it does not appear that a significant active splay of the Newport-Inglewood fault is present beneath or immediately adjacent to the proposed headworks structures. The "high activity" fault splays identified by Law/Crandall in 1994 (see Figure 3.3-2) appear to be the closest location of possible surface fault

[12] Converse Consultants, *Final Geologic Hazards and Geotechnical Investigation Report Proposed Headworks Replacement P2-66,* August 15, 2002, and Converse Consultants, *Supplemental Geotechnical Investigation Report Proposed Headworks Replacement P2-66,* March 17, 2003.

rupture that might be associated with a future large earthquake. No additional "high activity" faulting was identified during Converse Consultants' 2002 geotechnical investigation. Neither vertical nor lateral offset of Holocene-age sediments, which would indicate an "active" fault splay, was present beneath the planned locations of the proposed critical structures. The Odor Control Facility and Screenings Loading Building, both of which are considered non-critical structures, would be constructed overlying or within 50 feet of "high activity" fault splays as shown in Figure 3.3-2. None of the new buildings to be constructed for the project are structures intended for human occupancy as defined in the Alquist-Priolo Earthquake Fault Zoning Act.[13] Therefore, it is not required that these structures be set back 50 feet from these "high activity" fault splays. The Odor Control Facility will house above-ground chemical storage tanks (16,000 gallons of sodium hypochlorite, 12,000 gallons of sodium hydroxide, and 8,000 gallons of hydrochloric acid). Tank design specifications include secondary containment with the capacity to hold the entire contents of the tank to provide protection from seismic hazards. See Chapter 3.4 Hazards and Hazardous Materials for further discussion on chemical storage and spill response. Some piping would have to cross at least one known "high activity" fault splay. Therefore, the geotechnical report recommends using pipes with flexible coupling to accommodate potential ground movement.

- *Ground Shaking:* Seismic activity could generate moderate to strong ground shaking at the site. A probabilistic seismic response analysis was performed for the Maximum Probable Earthquake (MPE) and Upper Bound Earthquake (UBE).[14] Peak horizontal acceleration was calculated at 0.5g for the MPE and 0.6g for the UBE.

- *Liquefaction Potential:* Subsurface soils within the upper 50 feet are predominantly dense to very dense sand and silty sand. Isolated layers of medium dense sands were encountered in fill material and 40 feet or more below ground surface. Most of the fill material will be removed for construction of the basements of below grade structures. Furthermore, the isolated liquefiable sandy soils are relatively deep below existing grade. Liquefaction potential was evaluated for ground motions corresponding to the MPE and UBE events, and only isolated sandy soils were found to be potentially liquefiable during a seismic event.

- *Landslides and Lateral Spreading:* The topography of the site and immediate surroundings is relatively flat. Consequently, the potential for seismically induced landslides and lateral spreading impacting the site is considered low.

- *Differential Settlement:* Differential could occur in the isolated medium dense sandy layers in the fill and below 40 feet. Settlement of approximately one inch or less is expected for the site.

The potential seismic hazards that exist at the site would require engineering and construction methods that are appropriate for the site-specific conditions. Mitigation measures for seismic impacts have been previously addressed in the 1999 PEIR in Measures 6.6-1b, 6.6-2a, and 6.6-2b (see Appendix A). Any new structures for the proposed project will be designed to meet the current CBC standards specific for the underlying geologic materials in order to ensure the safety of the structure and its occupants. The

[13] Section 3601, Paragraph (e) of the Alquist-Priolo Earthquake Fault Zoning Act defines a "structure for human occupancy" as "…any structure used or intended for supporting or sheltering any use or occupancy, which is expected to have a human occupancy rate of more than 2,000 person-hours per year."

[14] Converse Consultants, *Final Geologic Hazards and Geotechnical Investigation Report Proposed Headworks Replacement P2-66,* August 15, 2002. The MPE is defined as a seismic event with a 10% probability of exceedance in 50 years, which corresponds to a return period of 475 years. The UBE has a 10% probability of exceedance in 100 years and a return period of 950 years.

geotechnical investigation performed by Converse Consultants in 2002 examined subsurface conditions as discussed above and found the site suitable for the proposed project provided that recommendations made in the geotechnical reports are incorporated into the project.[15] As specified in the 1999 PEIR in Mitigation Measure 6.6-1a, geotechnical recommendations will be incorporated into project design and construction.

Mitigation Measures

See Measures **6.6-1b, 6.6-2a**, and **6.6-2b** in the 1999 PEIR found in Appendix A.

M-3.3-1: The District shall implement the recommendations made in the geotechnical report prepared by Converse Consultants, which includes, but is not limited to, the following:

- For construction near fault splays, additional excavation and backfill with non-cohesive material on the base and sides of structures may be required.
- To accommodate potential ground movement caused by a seismic event, pipes with flexible coupling should be considered.
- Removal and recompaction of the upper fill soils to minimize the potential for differential settlement to affect structures on grade.
- For critical structures, the use of mat foundation or reinforced perimeter footings with interior footings interconnected with grade beams for more rigidity to reduce the potential of seismically induced settlement or liquefaction.
- Structures with basements should be supported on mat foundations founded on native soils or compacted fill.
- Groundwater should be lowered by dewatering to at least five feet below the lowest excavation level. Existing structures should be protected during dewatering.
- Temporary construction slopes should be 1.5:1 or flatter for soils below groundwater level and 1:1 or flatter for soils above groundwater level. Surcharge loads should not be permitted within five feet or a distance equal to the depth of excavation, whichever is greater, unless the excavation is properly shored.
- Temporary shoring will be required where open cut excavations will not be feasible and space limitations would not allow for minimum excavation slopes or because of nearby structures.

Significance after Mitigation

Less than significant.

[15] Converse Consultants, *Final Geologic Hazards and Geotechnical Investigation Report Proposed Headworks Replacement P2-66,* August 15, 2002, and Converse Consultants, *Supplemental Geotechnical Investigation Report Proposed Headworks Replacement P2-66,* March 17, 2003.

Impact 3.3-2: Dewatering could create unstable soil conditions, creating risks to proposed and nearby existing structures.

The geotechnical investigations performed by Converse Consultants identified the need for dewatering where excavation depths are lower than groundwater levels. The geotechnical report recommended that groundwater be lowered at least five feet below the lowest excavation level to prevent loosening of the soils and heaving at the bottom of the excavation. The report also concluded that dewatering could promote land settlement in surrounding areas, which could cause damage to nearby existing structures on the plant site.

A hydrogeologic study was conducted by Converse Consultants in September 2003, which evaluated the permeability of the soils and dewatering characteristics of the site.[16] The hydrogeologic report evaluated aquifer characteristics and provided design criteria for the dewatering system so that engineering methods can be developed to protect the stability and integrity of the existing and proposed structures and avoid significant impacts to these structures. The District will implement the recommendations to minimize the risk of settlement from dewatering to ensure conformance with CBC standards. With incorporation of the design recommendations, no further mitigation would be necessary.

Mitigation Measures

No mitigation measures are required.

Significance after Mitigation

Less than significant.

[16] Converse Consultants, *Hydrogeologic/Dewatering Investigation, Proposed Headworks Replacement P2-66*, September 17, 2003.

3.4 HAZARDS AND HAZARDOUS MATERIALS

This section of the EIR presents the analysis of the potential for the proposed project to result in significant impacts from the use of hazardous materials.

3.4.1 SETTING

Hazardous substances include chemicals regulated by both the United States Department of Transportation's (DOT) "hazardous materials" regulations and the EPA "hazardous waste" regulations, including emergency response. Hazardous wastes require special handling and disposal because of their potential to damage public health and the environment. Hazardous materials are generally substances which, by their nature and reactivity, have the capacity of causing harm or a health hazard during normal exposure or an accidental release or mishap, and are characterized as being toxic, corrosive, flammable, reactive, an irritant, or strong sensitizer.

A "hazardous chemical" is defined by the Federal Occupational Safety and Health Administration (OSHA) as any chemical that is a physical hazard or a health hazard. EPA regulations define "hazardous waste" based on certain characteristics (ignitability, corrosivity, reactivity, and toxicity). In addition, EPA has determined that some specific wastes are hazardous regardless of concentration (referred to as "listed wastes").

Activities and operations that use or manage hazardous or potentially hazardous substances could create a hazardous situation if released into the environment. The degree of hazard will depend on the type of substance and quantity released.

The District currently stores and uses the following chemicals in the treatment process.

- **Ferric chloride** acts as a coagulant in advanced primary treatment. It is a noncombustible, corrosive liquid that is irritating to unprotected skin and mucous membranes. Inhalation risks are low due to its low vapor pressure. Ingestion may cause nausea and vomiting. It is stable under normal use and storage. Spills are neutralized with lime, soda ash, or sodium bicarbonate.

- **Sodium hypochlorite** solutions, used in place of gaseous chlorine as a disinfectant, are unstable and some chlorine vapor can be released in the event of a spill. However, chlorine vapor production is minimal in comparison to pressurized gaseous chlorine. Therefore, potential hazards are less than those associated with gaseous chlorine.

- **Sodium hydroxide,** also known as caustic soda, is a highly basic substance used in air scrubbers to neutralize hydrogen sulfide odors. It is considered the most hazardous chemical stored in large quantities at the site. It can cause severe burns to skin and clothing and can severely corrode equipment coming in contact with it. Although it poses a potential worker safety hazard it does not readily vaporize or pose a threat to off-site receptors.

- **Hydrochloric acid** of 10 to 15 percent solutions is used to clean equipment during routine maintenance. This concentration is capable of causing mild burns to skin, but is not considered an explosion or toxic cloud hazard to neighboring areas.

APPLICABLE REGULATIONS

Federal and State

Title III of the Superfund Amendment and Reauthorization Act of 1986 (42 U.S. Code 6901 et. seq.) is the Emergency Planning and Community Right-to-Know Act. Facilities are required to report the following four items on U.S. Environmental Protection Agency Form R (the Toxic Chemical Release Inventory Reporting Form): facility identification information; off-site locations to which toxic chemicals are transferred in wastes; chemical-specific information; and supplemental information. Form R requires a facility to list the hazardous substances that are handled on-site, and to account for the total aggregate releases of listed toxic chemicals for the calendar year.

Worker safety is regulated through OSHA as well as the State version, Cal/OSHA. Federal OSHA establishes in the Code of Federal Regulations Title 29 (CFR 29) 40 hours of training for hazardous materials operators. The training includes personal safety, hazardous materials storage and handling procedures, and emergency response procedures.

In California, Title 22 and Title 23 of the CCR address hazardous materials and wastes. Title 22 defines, categorizes, and lists hazardous materials and wastes. Title 23 addresses public health and safety issues related to hazardous materials and wastes and specifies disposal options.

The U.S. Department of Transportation regulates hazardous materials transportation. State agencies with primary responsibility for enforcing federal and state regulations and responding to hazardous materials emergencies are the California Highway Patrol and local Fire Departments.

The Hazardous Materials Release Response Plans and Inventory Law (California Health and Safety Code, Section 25500 *et. seq.*) governs hazardous materials handling, reporting requirements, and local agency surveillance programs. It requires businesses that store hazardous materials on-site prepare an inventory and submit it to local health and fire departments.

Local

The proposed headworks project would occur entirely within Orange County within the City of Huntington Beach. Therefore, the proposed project would be subject to the local plans and policies of the City and the County that cover hazards and hazardous materials. The General Plan for each jurisdiction contains goals, policies, and implementation measures that are designed to protect public health and safety from a variety of hazards.

3.4.2 IMPACTS AND MITIGATION

CRITERIA FOR DETERMINING SIGNIFICANCE

The criteria used to determine the significance of an impact are based on the initial study checklist in Appendix G of the State CEQA Guidelines.

The proposed project may result in a significant impact if it would:

- create a significant hazard to the public or environment through the routine transport, storage, use, or disposal of hazardous materials;
- create a significant hazard to the public through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- emit hazardous emissions or handles hazardous or acutely hazardous materials, substances, or waste be within ¼-mile of an existing or proposed school;
- be located on a site that is known to contain hazardous materials or is listed on a site compiled pursuant to Government Code Section 65962.5, and as a result could create a significant hazard to the public or the environment;
- result in a safety hazard for people residing or working in the project area for a project located within an airport land use plan, within two miles of a public airport or within the vicinity of a private airstrip;
- impair or interfere with the implementation of an adopted emergency response plan or emergency evacuation plan; or,
- expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

PROJECT IMPACTS

Impact 3.4-1: The proposed project would include the routine transport and storage of hazardous chemicals.

Implementation of the proposed project would require the transport, storage, and use of significant quantities of chemicals including ferric chloride, sodium hypochlorite, sodium hydroxide, and hydrochloric acid. All of these chemicals are currently used at the plant and their use was discussed in Section 6.9 of the 1999 PEIR.

The proposed project would involve the construction of two 21,000-gallon aboveground ferric chloride storage tanks located adjacent to the main facility. Figure 2-2 shows the proposed location for the storage tanks. The new system would use approximately 6,000 gallons of ferric chloride per day. Sodium

hypochlorite would be stored in a 16,000-gallon aboveground storage tank. The new system would use up to 2,200 gallons per day (gpd) of sodium hypochlorite. A 12,000 gallon aboveground storage tank would be installed for sodium hydroxide (average of 900 gpd) and an 8,000 gallon tank for hydrochloric acid. Table 3.4-1 summarizes the estimated volume of chemicals that would be used each week with implementation of the proposed project. Proposed chemical deliveries would increase by approximately eight trucks per week.

TABLE 3.4-1: CHEMICAL USE AND DELIVERIES FOR THE HEADWORKS

Chemical	Current Use (gpd)	Current Deliveries (truck trips/week)	Proposed Use (gpd)	Proposed Deliveries (truck trips/week)
Ferric chloride	6,400	18	6,000	17
Sodium hypochlorite	100 – 390	1	2,200	7
Sodium hydroxide	108	< 1	900	3
Hydrochloric acid	60	< 1	27	< 1
TOTAL		20		28

Note: Assumes delivery truck capacity of 2,500 gallons.

Source: OCSD.

The chemicals would be routinely delivered to the newly constructed storage facilities. All tanks would have secondary containment structures to capture full tank volume in the event of a spill. The District has implemented an Integrated Emergency Response Program (IERP) covering worker safety, spill prevention, emergency response, and hazardous materials management at the treatment plants. The IERP includes the Spill Prevention Containment and Countermeasure (SPCC) Plan required by the Santa Ana Regional Water Quality Control Board (SARWQCB) which includes structural specifications for storage tanks, visual monitoring schedules for aboveground storage tanks, underground storage tank tightness testing schedules, emergency response procedures, and reporting requirements. The IERP includes safety procedures for operations and maintenance workers; including worker safety training, hazard communications, personal protective equipment, site security, and departmental organization. Training in and implementation of the Incident Command System for managing crisis situations is also included in the IERP. The secondary containment and IERP procedures would provide adequate protection from potential chemical hazards. No mitigation is necessary.

Mitigation Measures

No mitigation measures are required.

Significance after Mitigation

Less than significant.

Impact 3.4-2: Contaminated soils could be encountered during underground storage tank removal or excavation for construction of the new structures.

The District currently maintains several underground storage tanks (USTs) on-site. The project calls for the removal of two 12,000-gallon capacity USTs, one used to store gasoline and the other used to store diesel fuel. It is possible that removal of the tanks or excavation for construction of some of the new structures could reveal soils contaminated from previously unknown spills or leaks. UST removal procedures are subject to Orange County Health Care Agency (the Certified Unified Program Agency) and SARWQCB requirements including notification and soil sampling. As the Certified Unified Program Agency for Orange County, the Health Care Agency is the local administrative agency that coordinates six programs regulating hazardous materials and hazardous wastes in Orange County and serves as a single point of contact for notification, permitting, and inspections. Implementation of the following mitigation measure would ensure that if contaminated soils were encountered, removal would be handled in accordance with applicable regulations

Mitigation Measures

M-3.4-1: Any contaminated soils encountered on the project site during tank removal, site clearance, or excavation shall be removed from the project site and disposed of off-site in accordance with applicable hazardous waste regulations. The District will notify the Orange County Health Care Agency of remedial actions.

Significance after Mitigation

Less than significant.

Impact 3.4-3: Structures to be demolished may contain lead paint and/or asbestos containing materials.

The older structures on the site to be demolished may contain lead-based paint and asbestos, which could pose a hazard to workers or the environment if not removed and disposed of in a safe manner in accordance with applicable regulations.

Mitigation Measures

M-3.4-2: Structures to be demolished will be investigated for the presence of lead paint or asbestos containing material and proper precautions will be taken for safe removal and disposal of these materials prior to demolition activities.

Significance after Mitigation

Less than significant.

Impact 3.4-4: Construction activities could disturb abandoned oil and gas wells and pose a potential fire or explosion hazard.

The project is located in area of known oil and gas resources. The West Newport Oil Company oilfield is located less than a mile to the east across the SAR. There are several plugged and abandoned wells located on the Treatment Plant No. 2 property. Oil and gas well location maps show that there is a plugged and abandoned dry well, No. 45-2281, near the proposed project site.[1] This well was drilled in 1945 to a depth of 2,281 feet. The Division of Oil, Gas, and Geothermal Resources (Division) recommends not building over or in close proximity to any oil or gas well because of potential fire or explosion hazards if the well has any oil or gas leakage. The Division provides construction site plan review services and will inspect and test the well once it is located. It is the responsibility of the District to locate the well, however the Division will provide a location of record to aid with well location. The well must be re-abandoned if there is any sign of leakage. The Division should be consulted to inspect the well if the construction footprint is within 10 feet of the well. The legal description indicates that the well is approximately 21 feet from the proposed location of the Trunkline Odor Control Facility and therefore, would not require inspection by the Division.[2] If the construction footprint were to be altered and come within 10 feet of the well or if a previously unknown well were to be uncovered during excavation, implementation of the following mitigation measure would reduce impacts to less than significant.

Mitigation Measures

M-3.4-3: The District shall comply with requirements of the Division of Oil, Gas, and Geothermal Resources Construction Site Plan Review process. The Division will be notified if any previously unknown wells are discovered during the construction process.

Significance after Mitigation

Less than significant.

[1] State of California Department of Conservation, Division of Oil, Gas, and Geothermal Resources, District 1 Well Location Map No. 136, August 17, 2002.

[2] Besett, Thomas, Carollo Engineers, personal communication, August 21, 2003.

3.5 HYDROLOGY AND WATER QUALITY

INTRODUCTION

This section assesses the potential impacts to surface water hydrology, surface water quality, groundwater hydrology, and groundwater quality resulting from the construction and operation of the proposed Headworks Replacement Project. This section also focuses on the proposed project's consistency with state, regional, and local water quality policies/regulations and applicable standards and discharge permit conditions.

3.5.1 SETTING

OCSD serves approximately 226,068 acres of the coastal plain of north and central Orange County. The regional environmental setting is described in detail in the PEIR. The project site is located at the OCSD Treatment Plant No. 2 in the City of Huntington Beach. The site is adjacent to the SAR about 1,500 feet from the ocean. The plant is located on an approximately 110-acre triangular parcel bounded by Brookhurst Street on the northwest, PCH on the southwest, and the SAR on the east.

Surface Water

Surface water in the region primarily consists of water flowing in the SAR and its tributaries, which drain the southern portion of the eastern San Gabriel Mountains and southern parts of the San Bernardino Mountains. The SAR flows are diverted to groundwater recharge spreading basins near Anaheim by the Orange County Water District (OCWD). Summer flows from the upper SAR rarely reach beyond the basins to Burris Pit located more than 20 miles upstream from the ocean. Only occasional winter storm flows reach the ocean.

The lower reach of the SAR channel runs adjacent to the site on the east. The SARWQCB Basin Plan has not established numeric water quality standards for this reach; only narrative objectives apply. Beneficial uses identified by the SARWQCB include non-contact water recreation, warm freshwater habitat, and wildlife habitat.

The 40-foot wide Talbert Marsh, maintained by the Huntington Beach Wetlands Conservancy, lies between the southwest border of Treatment Plant No. 2 and PCH. In addition, wetlands are being restored by the U.S. Fish and Wildlife Service directly across the SAR from Treatment Plant No. 2 to the east.

The closest water body on the EPA approved 2002 303(d) list is Huntington Beach State Beach, which is located across PCH and north approximately one mile. The beach is listed as impaired by Enterococci bacteria within 50 yards around the storm drain at Magnolia Street and the potential source is listed as unknown. Lower Newport Bay, the inlet to which is located approximately six miles south of the project site, is listed for metals and pesticides.

Groundwater

Much of the groundwater beneath the OCSD service area is recharged with diverted SAR water by OCWD. Treatment Plant No. 2 lies over the Santa Ana Pressure groundwater basin. According to the SAR Basin Plan, this basin has several designated beneficial uses: municipal and domestic, agricultural, industrial service, and industrial process supply. The basin is the primary source of local drinking water supplies. Heavy pumping in the past has caused seawater intrusion into the aquifer as much as five miles inland. To prevent further intrusion, OCWD operates a hydraulic barrier system consisting of 23 injection wells located four miles inland that deliver recycled water into the aquifer. Treatment Plant No. 2 is located between the coast and the barrier system.

Groundwater beneath Treatment Plant No. 2 is found at shallow depths due to its close proximity to the ocean. The depth to groundwater is tidally influenced and varies from season to season and from year to year. Consequently, dewatering operations have been necessary during past construction activities. The OCSD has established dewatering operation standards for contractors performing work within the boundaries of its treatment plants. Discharge from dewatering is governed by a National Pollutant Discharge Elimination System (NPDES) permit (No. CAG998001) issued by the SARWQCB. Water from dewatering activities is typically disposed of through the plant's treated effluent system and ultimately discharged through the ocean outfall.

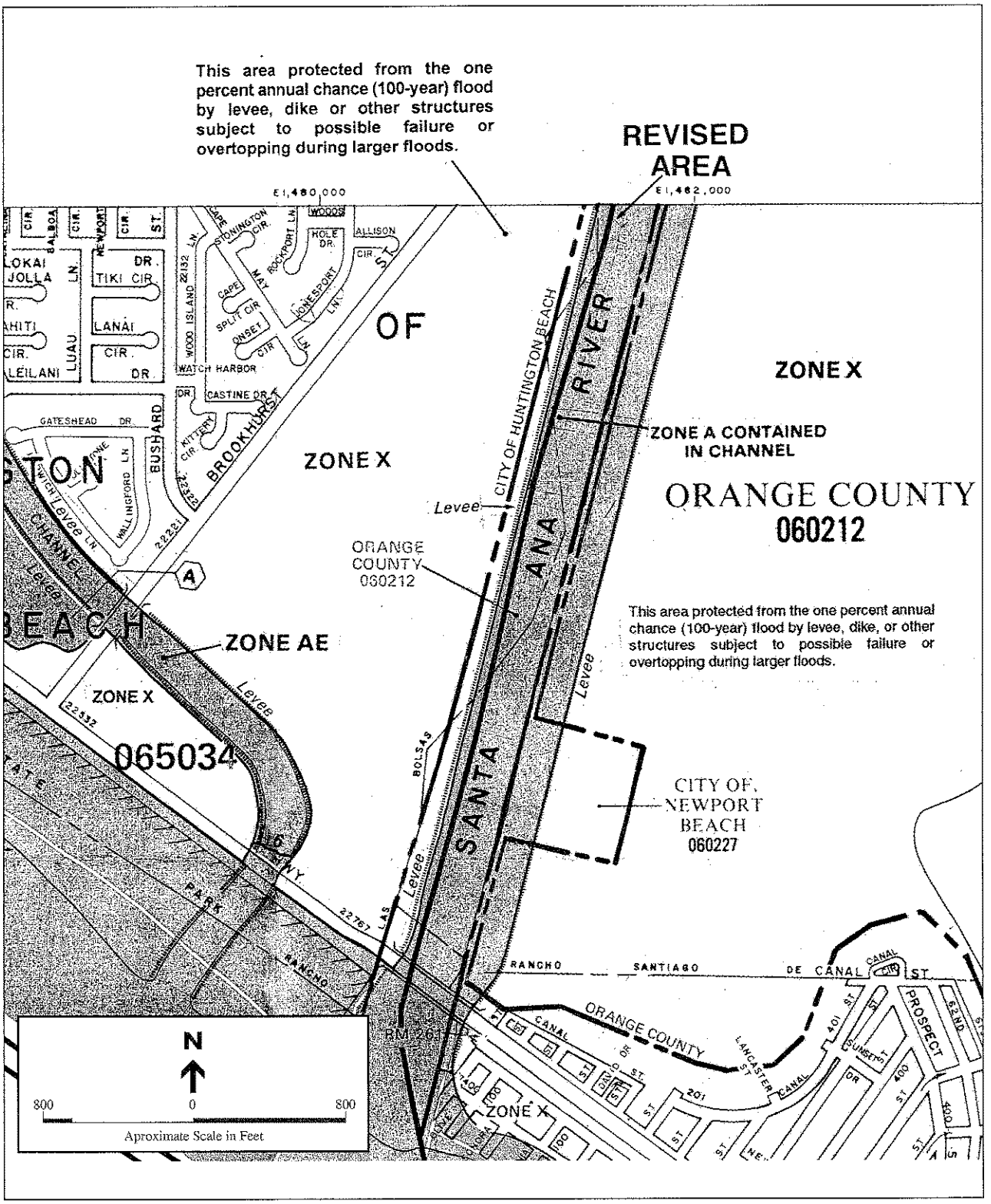
Flooding

A flood hazard may occur when land within a flood plain area is developed. Historically, Orange County has been vulnerable to flooding during peak rainfall events. Encompassing over 3,200 square miles, the SAR Basin is the largest watershed in Southern California. Since 1989, the U.S. Army Corps of Engineers (ACOE) has significantly reduced flood risks along the SAR by completing the construction of concrete-lined levees and flood control channels along much of the river and its tributaries.

With the newly constructed levees, Treatment Plant No. 2 is no longer within the 100-year floodplain. The treatment plant is protected from flooding by walls and levees which were constructed by the ACOE in 1995. The Flood Insurance Rate Map for the area where the Plant is located was recently revised by Federal Emergency Management Agency (FEMA) as Zone X, an area "protected from the one percent annual chance flood by levee, dike, or other structures subject to possible failure or overtopping during larger floods".[1] A portion of the revised FEMA map is shown in Figure 3.5-1.

Earthquakes can cause flooding due to tsunamis, seiches, or by causing dam failure. Tsunamis are a potential hazard at this site due to the close proximity of the coast and elevation of roughly eight feet above mean sea level. Orange County has not experienced a tsunami of magnitude greater than high storm tides, however the coastal area can be subject to potential tsunami damage when combined with high tides. The offshore islands provide some protection to the coastline from the impacts of tsunamis originating from distant seismic events. The project area is classified as a Moderate Tsunami Run-Up Area according to the City of Huntington Beach General Plan, Environmental Hazards Element.

[1] FEMA, Flood Insurance Rate Map Number 06059C0054F, February 13, 2001.



SOURCE: FEMA FIRM 06059C0054F

Figure 3.5-1
FEMA Flood Zone Map

Seiches are earthquake-induced waves in an enclosed or partially enclosed body of water, which may produce flooding in local areas. The project is not located near a body of water that could experience seiches. The nearest reservoir is Prado Dam, located near the city of Corona in Riverside County. The Dam was completed in 1941 by the ACOE to control flooding in the Lower SAR Basin. Flood Inundation Maps prepared by the ACOE show that Treatment Plant No. 2 is located within the Prado Dam Inundation Area.[2]

Drainage

The project site is located in an area of relatively flat topography. The Plant No. 2 drainage system is designed to collect and treat storm water within the treatment area. Storm water runoff associated with the treatment process area is currently captured, treated, and disposed through the ocean outfall.

APPLICABLE REGULATIONS AND EXISTING PERMITS

The EPA is the federal agency responsible for water quality management and administration of the federal Clean Water Act (CWA). The EPA has delegated most of the administration of the CWA in California to the SWRCB. The State Water Resources Control Board (SWRCB) was established through the California Porter-Cologne Water Quality Act of 1969 and is the primary State agency responsible for water quality management issues in California. Much of the responsibility for implementation of the SWRCB's policies is delegated to the nine Regional Water Quality Control Boards (RWQCBs). The project site is located in the SARWQCB.

Section 402 of the CWA established the NPDES to regulate discharges into "navigable waters" of the United States. The EPA authorized the SWRCB to issue NPDES permits in the State of California in 1974. The NPDES permit establishes discharge pollutant thresholds and operational `conditions for industrial facilities and wastewater treatment plants. Non-point source NPDES permits are also required for municipalities and unincorporated communities of populations greater than 100,000 to control urban stormwater runoff. These municipal permits require the preparation of Storm Water Management Plans (SWMPs) that reflect the environmental concerns of the local community.

A key part of the SWMP is the development of Best Management Practices (BMPs) to reduce pollutant loads. Certain businesses and projects within the jurisdictions of these municipalities are required to prepare Storm Water Pollution Prevention Plans (SWPPPs) which establish the appropriate BMPs to gain coverage under the municipal permit.

Currently, individual storm water NPDES permits are required for specific industrial activities and for construction sites greater than five acres. State-wide general storm water NPDES permits have been developed to expedite discharge applications. They include the State-wide industrial permit and the State-wide construction permit. A prospective applicant may apply for coverage under one of these permits through the preparation of a SWPPP. Phase II of the storm water permitting for construction activities will require coverage for construction sites between 1 and 5 acres and is scheduled to be implemented during the construction of this project.

[2] Ibid; and U.S. Army Corps of Engineers website, http://www.spl.usace.army.mil/resreg/htdocs/PrdoFIM/plate7.pdf, accessed June 6, 2002.

Section 303(d) of the CWA requires the SWRCB to list impaired water bodies in the State and determine total maximum daily loads (TMDLs) for pollutants or other stressors impacting water quality. The SAR is listed as an impaired water body although TMDLs have not yet been determined for any of the identified impaired reaches.

3.5.2 IMPACTS AND MITIGATION

CRITERIA FOR DETERMINING SIGNIFICANCE

The proposed project may have a significant impact on surface hydrology, water quality, and/or groundwater if it meets or exceeds the following thresholds:

- violate any water quality standards or waste discharge requirements;
- substantially deplete groundwater supplies or interfere substantially with groundwater recharge;
- substantially alter existing drainage patterns resulting in substantial erosion and/or flooding on- or off-site;
- create runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial sources of polluted runoff;
- substantially degrade overall water quality;
- place structures within a 100-year flood hazard zone that would impede or redirect flood flows;
- expose people or structures to significant risk of loss, injury or death involving flooding, including flooding from failure of a dam or levee; and,
- expose people or structures to significant risk of loss, injury or death involving inundation by seiche, tsunami, or mudflow.

PROJECT IMPACTS

Impact 3.5-1: The proposed project will temporarily modify the quality of effluent discharged to the ocean.

The new headworks would be connected to the incoming sewers and treatment plant in three phases during the final 14 months of construction. During each phase, one third of the primary clarifiers would be disconnected from the old headworks and reconnected to the new headworks. During this 14-month process, the treatment capacity at Plant No. 2 would be diminished by approximately one third (approximately 60 mgd), from 168 to 108 mgd.[3] Average daily flows to Plant No. 2 are anticipated to be 144 mgd in the year 2008, when the connection phase is scheduled to begin. As a result, during the

[3] This is based on the nine remaining basins being in service at 12 mgd capacity each. These capacities are identified in the 1999 Strategic Plan, Volume 4.

headworks connection period, inflow at Plant No. 2 would exceed the rated treatment capacity. This would effect overall effluent quality and would result in exceeding the OCSD NPDES discharge permit thresholds, which would be considered a significant impact of the project.

In order to avoid over loading the treatment plant while its capacity is diminished during construction, OCSD would divert approximately 58 mgd of Plant No. 2 flow to Plant No. 1 via the Ellis Avenue Pump Station. The diverted wastewater would originate in the Miller-Holder, Magnolia, and Bushard trunk sewers, which normally convey the wastewater to Plant No. 2. The ability to divert this 58 mgd flow to Plant No. 1 would be dependent on the completion of a proposed replacement to the Ellis Avenue Pump Station. This replacement is independent of the Headworks Replacement project and is being planned and evaluated under CEQA as a separate project. With diversion of 58 mgd to Plant No. 1, Plant No. 2 would accommodate an average daily flow within its treatment capacity. Table 3.5-1 summarizes the primary treatment capacity of each plant and the average daily flows with and without the proposed Ellis Avenue Pump Station diversion.

As shown in Table 3.5-1, the diversion of 58 mgd to Plant No. 1 would provide an adequate balance for average daily flow and peak daily flow. However, the peak wet weather flow estimates assume an additional diversion of up to 83 mgd from Plant No. 2 to Plant No. 1 during a severe storm. If a peak wet weather event (storms occurring within a five-year frequency) were to occur during the 14-month construction period, primary treatment capacities at Plant No. 2 could be exceeded even with the 58 mgd diversion from the planned Ellis Avenue Pump Station. To avoid exceeding treatment capacity at Plant No. 2 during these 2 to 4-hour peak wet weather events, the estimates in Table 3.5-1 assume that additional flows would be diverted during these peak wet weather events from Plant No. 2 to Plant No. 1. The additional peak wet weather flow diversion would be accomplished by conveying flows in the Santa Ana River Interceptor (SARI) line planned for Plant No. 2 to Plant No. 1 during the event. Under normal dry weather conditions, the SARI line is to convey approximately 50 mgd in 2008 consisting of municipal wastewater, groundwater desalter brine, and a small amount of highly treated wastewater (100,000 gallons per day) from the Stringfellow Superfund site cleanup process in Riverside County to Plant No. 2.

The SARI line waste stream is not acceptable source water for reclamation in the planned Groundwater Replenishment System (GWRS), which will be fed by secondary-treated wastewater produced at Plant No. 1. The first phase of the GWRS will be operational by 2007. This diversion of the SARI line waste stream from Plant No. 2 to Plant No. 1 during peak wet weather events would require that the GWRS suspend reclamation operations. If a peak wet weather event were to occur during the 14-month construction period, the OCWD would shut down all GWRS and Green Acres Project (GAP) processes. OCWD may have the option to continue to operate the microfiltration and disinfection processes of GWRS and discharge this effluent to the SAR until the peak event has passed and the SARI line has been rediverted to Plant No. 2. These disinfected microfiltration process discharges to the SAR are included in the permit application to the SARWQCB for the OCWD's NPDES permit for the GWRS facility.

OCSD analyzed the potential effect on the effluent quality from the temporary, 14-month modification by balancing the flow between the two treatment plants. Table 3.5-2 summarizes the estimated effluent quality for biological oxygen demand (BOD) and total suspended solids (TSS) levels in the year 2008 during the 14-month final phase of construction assuming that the Ellis Avenue Pump Station diverts

TABLE 3.5-1: TREATMENT CAPACITY AND ESTIMATED FLOWS AT 2008 DURING P2-66 CONNECTION PERIOD (MGD)

	Plant No. 1	Plant No. 2	Total
Treatment Plant Capacity [1]			
Average daily flow	211	108 [7]	319
Peak daily flow	267	136	403
Peak wet weather flow	422	238	660
Estimated Wastewater Flow [2]			
Without 58 mgd Ellis Diversion			
Average daily flow[3]	141	147	288
Peak daily flow[4]	175	186	361
Peak wet weather flow[5]	303	316	619
With 58 mgd Ellis Diversion			
Average daily flow	183	104	287
Peak daily flow	214	146	360
Peak wet weather flow[6]	403	216	619

Source: OCSD

(1) Based on available primary treatment capacity during 14 month connection period.
(2) Plant No. 1 flow includes 12 mgd of reverse osmosis brine from the Groundwater Replenishment System.
(3) Assumes Ellis pumps only what is needed for GWRS, approximately 15 mgd average daily flow (adf).
(4) Assumes Ellis pumps only what is needed for GWRS, approximately 18 mgd peak daily flow (pdf).
(5) Assumes Ellis pumps only what is needed for GWRS, approximately 41 mgd peak wet-weather flow (pwwf).
(6) Assumes diversion of the SARI line to Plant No. 1, at an estimated flow of 83 mgd. The SARI diversion would begin when a peak wet weather factor of 2.0 occurs. A total of 141 mgd will be diverted to Plant No. 1 from SARI and Ellis diversions. Also assumes GWRS is shutdown but 12 mgd of brine will occur for a few hours as system is drained
(7) Assumes five primary basins out of service, 60 mgd capacity reduction during 14-month construction period

58 mgd to Plant No. 1. Appendix F provides OCSD's operational plan through the year 2012. Appendix G includes the calculations to estimate effluent quality during this major tie-in period.

OCSD has recently consented to achieve full secondary treatment by the year 2012. In December 2002, OCSD applied for a new NPDES permit to recognize the shift in level of treatment. Since the construction of the necessary secondary treatment facilities would require approximately nine years, OCSD is currently negotiating an interim compliance strategy with the SARWQCB and the EPA. Based on preliminary discussions with SARWQCB and EPA, OCSD anticipates that the new NPDES permit effluent limitations will fall within a 30-day average range of between 95 and 105 mg/l for BOD and 55 to 70 mg/l for TSS during the interim compliance period. Table 3.5-2 includes these anticipated interim discharge threshold ranges.

OCSD's compliance is currently and will continue to be based on 24-hour composite sampling. A sample of OCSD's final effluent is collected every 3 million gallons, or approximately every 15 to 20 minutes. The 24-hour period is mixed together into a composite sample and tested for the compliance parameters like BOD and TSS. The thirty (30) consecutive days of composite sample results are then used to determine compliance with the NPDES permit.

TABLE 3.5-2: ESTIMATED OCEAN DISCHARGE EFFLUENT QUALITY[1], 2008

	BOD	TSS
Average Daily Flow (184 mgd)		
Without Diversion (mg/l)	84	39
With 58 mgd Diversion (mg/l)	95	44
Proposed Interim Ocean Discharge Limits (184 mgd)		
30-day average (mg/l)	95 – 105	55 – 70

Source: OCSD

(1) Effluent includes 12 mgd of brine from GWRS.

BOD = biochemical oxygen demand
TSS = total suspended solids
mg/l = milligrams per liter
MT = metric tons

Mitigation Measures

M-3.5-1: Prior to implementation of the connection phase of the new headworks, OCSD shall have in place the means of balancing influent between the two treatment plants to avoid exceeding effluent quality discharge limits.

M-3.5-2: OCSD shall include in its operating agreement with the Orange County Water District language stating that the SARI line may be diverted to Plant No. 1 during the 14-month headworks connection phase under a 2.0 or higher peaking factor during peak wet weather events. The agreement shall include procedures to be followed by OCSD and OCWD during peak wet weather events such that the GWRS will discontinue production of recycled water until the SARI line is removed from the source water of Reclamation Plant No. 1.

Significance after Mitigation

Less than significant.

Impact 3.5-2: The construction of the proposed project could result in erosion and receiving water quality impacts.

Construction of the proposed project could result in spills of chemicals such as fuel, oil, paints, and solvents, which could impact receiving waters if allowed to run off the site. Bare soils exposed during construction activities involving demolition, excavation, stockpiling, and grading could result in increased erosion and sedimentation to surface waters. The proposed project would require approximately 175,000 cy of soil to be excavated during construction. Approximately 100,000 cy of soil would be retained and used for backfill. In addition, approximately nine acres of the site will be graded and designed to generally match existing grades.

The existing site is fairly flat and little erosion is anticipated to occur from the project. The existing drainage system allows storm water that comes in to contact with process areas to be captured, treated, and ultimately discharged to the ocean. The headworks project is located within an area where storm water is collected and sent back through the treatment system. The Screenings Loading Building, Screenings Washing Building, the northern half of the Odor Control Facility, and part of the Influent Metering Structure are located in the currently undeveloped area where storm water is also captured and enters the treatment process. Mitigation Measures 6.7-1a, 6.7-1b, 6.7-1c, 6.7-1d, and 6.7-1e identified in the 1999 PEIR address potential storm water impacts. OCSD would ensure that construction contractors comply with the existing SWPPP for construction on the plant sites and implement BMPs for construction and operation of the proposed headworks project in accordance with the requirements of the SWMP and the Statewide NPDES General Permit for Construction Activities.

The project would involve excavation up to 45 feet deep for the Influent Metering Structure. The other facilities and piping would also require some excavation, but at a lesser depth. The proposed excavation would be deeper than local groundwater levels and would require dewatering during construction. A Notice of Intent for dewatering activities during construction would be submitted to the SARWQCB. Water from dewatering activities would be disposed of through the plant's treatment system and ultimately discharged through the ocean outfall after treatment. The dewatering would comply with the SARWQCB's existing General NPDES Permit (CAG998001) for de minimis discharges including construction dewatering.[4] Mitigation measures for dewatering activities are discussed in the PEIR in Measures 6.7-2a and 6.7-2b, which are attached in Appendix A.

Mitigation Measures

See Mitigation Measures 6.7-1a, 6.7-1b, 6.7-1c, 6.7-1d, 6.7-1e, 6.7-2a and 6.7-2b of the 1999 PEIR found in Appendix A.

Significance after Mitigation

Less than significant.

[4] NPDES permit No. CAG998001, Order No. R8-2003-0061, 2003.

Impact 3.5-3: The proposed project would be susceptible to potential flooding impacts.

Treatment Plant No. 2 is adjacent to the SAR and protected from flooding by walls and levees that were constructed by the ACOE in 1995. As shown in Figure 3.5-1, the area where the Plant is located was recently revised by FEMA as Zone X, an area "protected from the one percent annual chance flood by levee, dike, or other structures subject to possible failure or overtopping during larger floods."[5] The Plant is, however, located within the Prado Dam Inundation Area.[6] In addition, the City of Huntington Beach General Plan Environmental Hazards Element indicates that the Plant is located in a Moderate Tsunami Run-Up Area. The likelihood that the Prado Dam will fail or that a tsunami large enough to inundate the plant will occur is low. The proposed projects would not increase the risks of inundation by tsunami or dam failure.

Mitigation Measures

No mitigation measures are required.

Significance after Mitigation

Less than significant.

[5] FEMA, Flood Insurance Rate Map Number 06059C0054F, February 13, 2001.

[6] Ibid; and U.S. Army Corps of Engineers website, http://www.spl.usace.army.mil/resreg/htdocs/PrdoFIM/plate7.pdf, accessed June 6, 2002.

3.6 NOISE

This section addresses noise impacts associated with the proposed project. It analyzes both potential noise impacts caused by the construction and operation of the headworks facility on the surrounding noise environment. Background information on environmental acoustics, including definitions of terms commonly used in noise analysis, is provided below.

3.6.1 SETTING

INTRODUCTION TO SOUND ASSESSMENT

Sound is mechanical energy transmitted by pressure waves through a medium such as air. Noise can be defined as unwanted sound. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). In particular, the sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level. The decibel (dB) scale is used to quantify sound intensity. Because sound pressure can vary by over one trillion times within the range of human hearing, a logarithmic loudness scale is used to keep sound intensity numbers at a convenient and manageable level. Since the human ear is not equally sensitive to all frequencies within the entire spectrum, noise measurements are weighted more heavily within those frequencies of maximum human sensitivity in a process called "A-weighting," written as dBA.

A number of different types of metrics are used to characterize the time-varying nature of sound. These metrics include: the equivalent sound level (L_{eq}), the minimum and maximum sound levels (L_{min} and L_{max}), percentile-exceeded sound levels (L_{xx}), the day-night level (L_{dn}), and the community noise equivalent level (CNEL). The following are brief definitions of these metrics and other terminology used in this section:

- **Sound.** A vibratory disturbance created by a vibrating object, which, when transmitted by pressure waves through a medium such as air, is capable of being detected by a receiving mechanism, such as the human ear or a microphone.

- **Noise.** Sound that is loud, unpleasant, unexpected, or otherwise undesirable.

- **Decibel (dB).** A unitless measure of sound on a logarithmic scale, which indicates the squared ratio of sound pressure amplitude to a reference sound pressure amplitude. The reference pressure is 20 micro-pascals.

- **A-Weighted Decibel (dBA).** An overall frequency-weighted sound level in decibels which approximates the frequency response of the human ear.

- **Maximum Sound Level (L_{max}).** The maximum sound level measured during the measurement period.

- **Minimum Sound Level (L_{min}).** The minimum sound level measured during the measurement period.

- **Equivalent Sound Level (L_{eq}).** The equivalent steady state sound level, which in a stated period of time would contain the same acoustical energy.

- **Percentile-Exceeded Sound Level (L_{xx}).** The sound level exceeded x percent of a specific time period. For example, L_{10} is the sound level exceeded 10 percent of the time.

- **Day-Night Level (L_{dn}).** The energy average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the A-weighted sound levels occurring during the period from 10:00 PM to 7:00 AM to account for the increased sensitivity of some individuals to noise levels during nighttime hours.

- **Community Noise Equivalent Level (CNEL).** The energy average of the A-weighted sound levels occurring during a 24-hour period with 5 dB added to the A-weighted sound levels occurring during the period from 7:00 PM to 10:00 PM and 10 dB added to the A-weighted sound levels occurring during the period from 10:00 PM to 7:00 AM.

L_{dn} and CNEL values rarely differ by more than 1 dB. As a matter of practice, L_{dn} and CNEL values are considered to be equivalent and are treated as such in this assessment.

Effect of Noise on People

The effects of noise on people can be categorized as follows:

- subjective effects such as annoyance, nuisance, dissatisfaction;

- interference with activities such as speech, sleep, learning; and,

- physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience effects in the last category. There is no complete satisfactory way to measure the subjective effects of noise, or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists, and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so called "ambient noise" level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships occur:

- except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived;

- outside of the laboratory, a 3 dBA change is considered a just-perceivable difference;

- a change in level of at least 5 dBA is required before any noticeable change in human response would be expected; and,

- a 10 dBA change is subjectively heard as approximately a doubling in loudness, and can cause adverse response.

These relationships occur in part because of the logarithmic nature of sound and the decibel system. The human ear perceives sound in a non-linear fashion, hence the decibel scale was developed. Because the decibel scale is based on logarithms, two noise sources do not combine in a simple additive fashion, rather logarithmically. For example, if two identical noise sources produce noise levels of 50 dBA, the combined sound level would be 53 dBA, not 100 dBA.

Noise Attenuation

Stationary point sources of noise, including stationary mobile sources such as idling vehicles, attenuate (lessen) at a rate of 6 to 7.5 dBA per doubling of distance from the source, depending on environmental conditions (i.e., atmospheric conditions and noise barriers, either landscaped or manufactured, etc.). Widely distributed noise, such as a large industrial facility spread over many acres or a street with moving vehicles, would typically attenuate at a lower rate, approximately 4 to 6 dBA.

LOCAL SETTING

Existing Noise Environment

The proposed project is located in the southern portion of Orange County in the City of Huntington Beach. The noise environment in the project area is dominated by noise from automobile traffic on local roads, aircraft over flights, and petroleum extraction activities. Vehicle noise from Brookhurst Street and Pacific Coast Highway, which border the site, are the dominant noise sources in the area.

The PEIR identified construction noise as a potentially significant unavoidable impact of construction at Treatment Plant No. 2. The PEIR provided mitigation measures to minimize the impact, but concluded that construction may temporarily increase CNEL noise levels more than 5 dBA over ambient levels during construction activities and phases such as ground clearing, excavation, foundation, erection, and finishing.

Sensitive Receptors

Some land uses are considered more sensitive to ambient noise levels than others due to the amount of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities typically involved. Residences, motels, hotels, schools, libraries, churches, hospitals, nursing homes, auditoriums, and parks and other outdoor recreation areas generally are more sensitive to noise than are commercial and industrial land uses.

There are a number of existing sensitive receptors located in close proximity to the project site and along roadway providing access to and from the project site. Sensitive receptors in the vicinity of the project site include single family residences located within 600 feet northwest of the treatment plant property line across Brookhurst Street and approximately 1,800 feet southeast of the treatment plant across the SAR. Nearby outdoor recreational areas include Huntington State Beach approximately 1,500 southwest,

Talbert Regional Park approximately 2,000 feet northeast, and the Santa Ana River bikeway located along the eastern border of the treatment plant along the SAR.

APPLICABLE REGULATIONS

Construction Noise

The project is located within Orange County and is subject to the Orange County Municipal Code and noise ordinances incorporated therein. Section 4-6-7 (e) of the Orange County Municipal Code covers noise due to construction. It states that noise sources associated with construction, repair, remodeling, or grading of any real property are exempt from the noise ordinance, provided said activities do not take place between the hours of 8:00 p.m. and 7:00 a.m. on weekdays, including Saturday, or at any time on Sunday or a federal holiday.

In addition to Orange County regulations, the project would be required to abide by the City of Huntington Beach Noise Ordinances. The City of Huntington Beach Municipal Code Chapter 8.40 Section 8.40.090 (d) exempts construction activities from the Noise Ordinance between the hours of 8:00 p.m. and 7:00 a.m. on weekdays, including Saturday, or at any time on Sunday or a federal holiday.

Operational Noise

Orange County Municipal Code Section 4-6-5 and Huntington Beach Municipal Code Chapter 8.40 outlines guidelines for land use compatibility with respect to noise generating uses for planning purposes. A brief summary of the Noise Ordinance is presented below in Table 3.6-1.

TABLE 3.6-1: GUIDELINES FOR NOISE COMPATIBLE LAND USE

	Day-Night Average Exterior Sound Level (CNEL dBA)	
Designated Noise Zone Land Use	**Time Interval**	**Exterior Noise Level**
Residential properties	10:00 p.m. to 7:00 a.m. (nighttime) 7:00 a.m. to 10:00 p.m. (daytime)	50 dBA 55 dBA
Professional office and public institutional properties	Anytime	55 dBA
All commercial properties with the exception of professional office properties	Anytime	60 dBA
All industrial properties	Anytime	70 dBA

Source: Huntington Beach Municipal Code Section 8.40.050 Exterior Noise Standards

Orange County Noise Standards

The County's Noise Ordinance has set acceptable noise levels at residential properties (see Table 3.6-1). Section 4-6-5 (b) states the following:

> It shall be unlawful for any person at any location within the unincorporated area of the County to create any noise, or to allow the creation of any noise on property owned, leased, occupied, or otherwise controlled by such person, when the foregoing causes the noise level, when measured on any other residential property, either incorporated or unincorporated, to exceed:
>
> 1) The noise standard for a cumulative period of more than thirty minutes in any hour;
> 2) The noise standard plus 5 dBA for a cumulative period of more than fifteen minutes in any hour; or
> 3) The noise standard plus 10 dBA for a cumulative period of more than five minutes in any hour; or
> 4) The noise standard plus 15 dBA for a cumulative period of more than one minute in any hour; or
> 5) The noise standard plus 20 dBA for any period of time.

City of Huntington Beach Noise Code

The City of Huntington Beach Municipal Code section 8.40.060 states the following:

> it shall be unlawful for any person at any location within the incorporated area of the City to create any noise, or to allow the creation of any noise on property owned, leased, occupied, or otherwise controlled by such person, which causes the noise level when measured on any residential, public institutional, professional, commercial or industrial property either within or without the City, to exceed the applicable noise standards:
>
> 1) For a cumulative period of more than thirty minutes in any hour;
> 2) Plus 5 dBA for a cumulative period of more than fifteen minutes in any hour; or
> 3) Plus 10 dBA for a cumulative period of more than five minutes in any hour; or
> 4) Plus 15 dBA for a cumulative period of more than one minute in any hour; or
> 5) Plus 20 dBA for any period of time.

3.6.2 IMPACTS AND MITIGATION

CRITERIA FOR DETERMINING SIGNIFICANCE

The proposed project may result in a significant noise impact if it would:

- expose existing receptors to or generate noise levels resulting from the project in excess of health standards established by the County noise ordinance;

- expose future visitors to the proposed site to existing or projected noise levels in excess of established standards and thresholds (if existing noise levels currently exceed criteria, incremental changes in noise levels in excess of 3 dBA above existing noise would be considered significant);

- result in excessive noise levels when measured at a distance of 50 feet from the noise source during construction activity occurring within 500 feet of a school zone or other sensitive noise receptor; or,

- expose persons to or generate excessive groundborne vibration or groundborne noise levels.

PROJECT IMPACTS

Impact 3.6-1: Operations of the proposed headworks facility would generate noise.

Operational activities associated with the proposed project that could generate noise include pump noise and truck traffic associated with chemical delivery and grit and sludge removal. The proposed project would replace the existing headworks structure. As such, the proposed project would not add any new sources of noise. The PEIR established a fence-line noise standard for operational noise of 55 dBA between 7:00 AM and 10:00 PM and 50 dBA between 10:00 PM and 7:00 AM. Mitigation Measure 6.4-2 of the PEIR states that measures to meet this fence-line standard include:

> "locating noise sources away from sensitive receptors, installation of acoustical enclosures around noise sources, installation of critical application silencers and sequential mufflers for exhaust noise, installation of louvered vents, directing vent systems away from nearby residences, and constructing soundwalls at the property lines."

This standard would apply to the newly proposed project. The proposed mitigation measure listed below would ensure that project operations would not constitute a significant noise impact.

Mitigation Measures

M-3.6-1: All buildings will be designed to insulate noise of the machinery such that fence-line noise standards would not be exceeded.

Significance after Mitigation

Less than significant.

Impact 3.6-2: The proposed project would generate noise during construction.

The proposed project may result in an increase in noise levels during construction that could affect sensitive noise receptors. Construction activities associated with the proposed project could intermittently

generate high noise levels on, and adjacent to, the treatment plant site. Construction activities associated with the proposed project include demolition, grading and earthmoving activities, hauling materials, sheet piling for shoring excavations, and building structures. Construction noise levels at and near the project site would fluctuate depending on the particular type, number, and duration of uses of construction equipment. Construction-related material haul trips would raise ambient noise levels along haul routes. Existing residences and other nearby noise-sensitive uses that could be exposed to construction noise are the single-family residences located to the northwest of the construction site in Huntington Beach.

Table 3.6-2 summarizes typical noise levels during different construction stages. Table 3.6-3 shows typical noise levels produced by equipment commonly used in construction projects. As indicated, equipment involved in construction is expected to generate noise levels ranging from 76 dBA to 91 dBA at a distance of 50 feet. Noise produced by construction equipment would be reduced by natural attenuation at a rate of about 6 decibels per doubling of distance.

TABLE 3.6-2: TYPICAL CONSTRUCTION NOISE LEVELS FOR PUBLIC WORKS SITE

Construction Phase	Noise Level (dBA, Leq[a])
Ground Clearing	84
Excavation (includes sheet piling for shoring)	91
Foundations	87
Erection	81
Finishing	89

a = Average noise levels correspond to a distance of 50 feet from the noisiest piece of equipment associated with a given phase of construction and 200 feet from the rest of the equipment associated with that phase.

Source: Bolt, Baranek, and Newman, *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances*, 1971.

TABLE 3.6-3: NOISE LEVELS FROM CONSTRUCTION EQUIPMENT

Construction Equipment	Noise Level (dBA, Leq at 50 feet)
Dump Truck	88
Portable Air Compressor	81
Concrete Mixer (Truck)	85
Scraper	89
Jack Hammer	88
Dozer	87
Paver	89
Generator	76
Pneumatic Tools	85
Concrete Pump	82
Backhoe	85

Source: Cunniff, *Environmental Noise Pollution*, 1977 and Federal Transit Administration, 1995.

Attenuation would reduce the noise level to approximately 70 dBA at the closest sensitive receptor (residential area in Huntington Beach on Brookhurst Street) located approximately 600 feet to the northwest. Existing intervening structures and landscaping would help reduce noise levels.

The PEIR concluded that construction noise would constitute a significant unavoidable impact of the planned construction activities at each treatment plant. Although the Headworks Replacement Project was not specifically listed in the PEIR, general construction activities were identified and evaluated. Construction of the headworks may temporarily increase ambient noise levels by over 5 dBA. The Headworks Replacement Project would be subject to mitigation measures 6.4-1a, 6.4-1b, and 6.4-1e of the PEIR (see Appendix A) requiring muffling devices and notification of neighboring residential areas.

Construction activities are short term and would comply with the Orange County Municipal Code Section 4-6-7(e) and the City of Huntington Beach Municipal Code Chapter 8.40.090(d) which limits construction activities to 7:00 a.m. to 8:00 p.m. Monday through Saturday. Mitigation measures M-3.6-2 listed below would further reduce the noise impact on local sensitive receptors.

Mitigation Measures

M-3.6-2: During construction phases, the contractor shall ensure that all construction is performed in accordance with the City of Huntington Beach and Orange County noise standards.

Significance after Mitigation

Less than significant.

Impact 3.6-3: The proposed project could generate groundborne vibration.

Construction activities such as excavation and grading have the potential to generate groundborne vibration near the construction site. Vibration would be caused by heavy trucks, excavators, dozers, and interlocking sheet piling for shoring during excavation. The noise associated with installation of sheet piling is much less than that for driving bearing piles because installation is done by vibratory means as opposed to a diesel driven hammer. Installation of sheet piling by vibratory means would be the most substantial source of vibration during construction. The closest residential area is located approximately 600 feet northwest of the construction site. At this distance, vibrations would attenuate to below the threshold of human perception.[1] Due to the short-term nature of the groundborne vibration and distance to sensitive receptors, this would be considered a less than significant impact.

Mitigation Measures

No mitigation measures are required.

Significance after Mitigation

Less than significant.

[1] Amick, Hal and Gendreau, Michael, "Construction Vibrations and Their Impact on Vibration-Sensitive Facilities", 2000.

3.7 TRAFFIC

3.7.1 SETTING

Regional

The existing regional transportation facilities, travel modes, and traffic conditions in Orange County are discussed in detail in the PEIR. The setting described in the PEIR is generally still applicable to the current transportation conditions. Orange County is crossed by Interstates 5 and 405 and State Routes 22, 55, 57, 73, and 91, which are shown in Figure 2-1. A network of major (six lane divided, 120-foot right of way), primary (4 – 6 lane divided, 100-foot right of way), and secondary (4-lane divided or undivided, 8-foot right of way) highways traverse the County. The freeway system generally carries relatively high traffic volumes.

Treatment Plant No. 2

Treatment Plant No. 2 is bordered by Brookhurst Street on the northwest, PCH (also known as State Route 1) on the southwest, and the SAR on the east. Access to Treatment Plant No. 2 is provided by a main entrance on Brookhurst Street, between Banning Avenue and Bushard Street. Two service entrances are located north and south of the main entrance off Brookhurst Street.

Traffic flows are typically described in terms of their level of service (LOS). LOS is defined by a volume-to-capacity ratio ranging from A (v/c ratio 0.0 – 0.6) to F (v/c ratio over 1.0). Levels A through C are generally considered good operating conditions with only minor delays. LOS D is fair operating conditions with drivers occasionally having to wait through more than one signal at the intersection. The City of Huntington Beach's current policy considers LOS D to be acceptable at traffic-controlled intersections and LOS C acceptable for roadway segments.

Brookhurst Street is a major six-lane, north-south arterial with a median that extends from SR-1 in Huntington Beach to Fullerton in northern Orange County. Brookhurst Street carries an Average Daily Traffic (ADT)[1] of between 12,000 and 49,000 from PCH to Garfield Avenue in the City of Huntington Beach.[2] Along this segment, available traffic data indicates that the intersection with Hamilton Avenue operates at LOS C in the A.M. and P.M. peak hours and the intersection with Adams Avenue operates at LOS D during both the A.M. and P.M. peak hours.[3] From Garfield Avenue to I-405 in the City of Fountain Valley, Brookhurst Street carries an ADT of 44,000 to 47,000.[4] The intersections of Brookhurst Street and Ellis Avenue and Brookhurst Street and Talbert Avenue both operate at LOS C in the A.M. peak and LOS B and D respectively in the P.M. peak.[5]

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[1] ADT represents the total number of vehicles that pass a segment of roadway in one day.

[2] Orange County Transportation Authority, 2001 Traffic Flow map, July 1, 2002. http://www.octa.net/streets/volume/2001.pdf.

[3] Escutia, Jim. City of Huntington Beach, Department of Public Works. Telephone communication, June 24, 2003.

[4] Orange County Transportation Authority, 2001 Traffic Flow map, July 1, 2002. http://www.octa.net/streets/volume/2001.pdf.

[5] Eskander, Mike. City of Fountain Valley, Public Works Department. Personal communication, June 9, 2003.

SR-1, also known as PCH, is a four-lane regional highway that runs along the western coast of the state. From the SAR to Brookhurst Street, it carries an ADT of 45,000. From Brookhurst Street to Beach Boulevard, it carries an ADT of 40,000.[6] The intersection of PCH and Brookhurst Street operates at LOS B during the A.M. peak hours, and LOS A during the P.M. peak hours.[7] The intersection of PCH and Beach Boulevard operates at LOS A during the A.M. peak hours and LOS B during the P.M. peak.[8]

Existing traffic entering the plant consists of chemical delivery trucks; screenings, grit, and biosolid removal trucks; and the vehicles of employees, construction workers, and visitors. Detailed information regarding existing operations-related traffic is described in Chapter 6 of the PEIR.

APPLICABLE REGULATIONS

County

The Orange County General Plan includes a Transportation Element, last updated in February 2000, that identifies goals, policies, and implementation programs for planning, developing, and maintaining a surface transportation system in the unincorporated areas of Orange County. The Element contains three closely related components: Circulation Plan, Bikeways Plan, and Scenic Highways Plan.

City of Huntington Beach

The Circulation Element of the City of Huntington Beach General Plan evaluates the existing roadway system and identifies measures to accommodate existing future growth. The Circulation Element contains goals and policies to accommodate local and regional future growth.

3.7.2 IMPACTS AND MITIGATION

CRITERIA FOR DETERMINING SIGNIFICANCE

The CEQA Guidelines find impacts to traffic to be significant if the project were to cause any of the following conditions:

- Cause an increase in traffic which is substantial in relation to existing traffic load and capacity of the street system;
- Exceed a level of service standard established by the county congestion management agency for designated roads or highways;
- Substantially increase hazards due to design features (e.g., sharp curves) or incompatible use (e.g., farm equipment);

[6] Orange County Transportation Authority, 2001 Traffic Flow Map, July 1, 2002. http://www.octa.net/streets/volume/2001.pdf

[7] Brohard, Tom. City of Huntington Beach Department of Public Works. Personal communication, July 9, 2002.

[8] Escutia, Jim. City of Huntington Beach, Department of Public Works. Telephone communication, June 24, 2003.

- Result in inadequate emergency access;
- Result in inadequate parking capacity;
- Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks or lanes).

PROJECT IMPACTS

Impact 3.7-1: Periods of peak construction of the proposed project would add to traffic along local access streets.

No detours, lane closures, or road closures are anticipated as a result of construction activities. However, increased truck traffic would be generated during peak construction periods. Project construction would require hauling of soil excavated from the site, concrete delivery, delivery of construction materials and machinery, and worker commute. Estimates of traffic traveling to and from the site during each phase of construction are shown below in Table 3.7-1.

TABLE 3.7-1: ESTIMATED PEAK DAILY CONSTRUCTION TRAFFIC AT PLANT NO. 2

Construction Phase	Activity	Duration (days)	Estimated Peak Daily Trips*
Mobilization	Construction trailers to site	10	5
Demolition	Large construction machinery to/from site	30	40
	Worker commute (20 workers)		40
Dewatering	Large construction machinery to/from site	40	40
	Dewatering equipment to/from site		20
	Worker commute (15 workers)		30
Excavation	Large construction machinery to/from site	150	10
	Sheet piling to/from site		20
	Tie-back systems to/from site		10
	75,000 cubic yards of earth from site		150
	Worker commute (45 workers)		90
Construction & Installation	Large construction machinery to/from site	1,050	40
	Structural and reinforcing steel to site		40
	Concrete – 40,000 cubic yards to site		100
	Piping, electrical and miscellaneous material and equipment to site		40
	Worker commute (60 workers)		120
Connection	Large construction machinery to/from site	430	20
	Piping material to site		40
	Paving and landscaping material to site		40
	Worker commute (60 workers)		120
Commissioning	Construction trailers from site	100	5
	Worker commute (15 workers)		30

* One way trips

Source: Carollo Engineers, 2003

Project construction is estimated to last for approximately five years. During this time, traffic on local surrounding roads could be affected. The largest source of daily traffic would be from construction workers and dirt haul trucks. Much of the traffic would access the site heading south on Brookhurst Street from Interstate 405 Freeway. Some traffic may access Brookhurst Street from PCH to the south. Peak construction traffic would be expected during the construction of the new facilities when materials are delivered to the site. During these periods, construction traffic could add up to 340 haul truck trips and worker vehicle commutes per day to the local streets. This number would not be considered significant when compared to the ADT of 12,000 to 49,000 on Brookhurst Street. Neither Brookhurst Street or PCH currently operate under unacceptable levels in the vicinity of the treatment plant.

Brookhurst Street near Plant No. 2 operates at LOS A under existing conditions. However, the local freeway system throughout Orange County generally experiences heavy traffic and delays during peak commute hours. The construction project would add some vehicles to the peak hour commute. However, much of the construction-generated truck trips would be spread out throughout the construction workdays rather than concentrated during peak hour commutes. Therefore, impacts on peak-hour traffic would likely be limited. Construction-related traffic would cause a temporary and intermittent lessening of the capacities of project area streets because of the slower movements and larger turning radii of construction trucks compared to passenger vehicles. The PEIR includes a mitigation measure (PEIR Measure 6.2-1) that requires the District to prepare a detailed construction schedule, notify the Cities of Fountain Valley and Huntington Beach of construction projects, and schedule construction vehicles to minimize traffic on arterial highways. Implementation of this mitigation measure requires the preparation of a traffic control plan, which will be prepared in consultation with the City of Huntington Beach Transportation Division. No further mitigation would be necessary to ensure that temporary construction would not significantly affect traffic.

Mitigation Measures

No mitigation measures are required.

Significance After Mitigation

Less than significant.

Impact 3.7-2: Operation of the project would slightly increase routine delivery and solids haul truck trips.

After completion of the project, operations would only slightly increase truck trips from Treatment Plant No. 2. Chemical deliveries would increase from four trips to five or six deliveries per day. Grit and screenings removal trips would be reduced from approximately 490 trips per year to approximately 310 haul truck trips per year due to improved screenings compaction and larger storage/hauling containers. Operation of the new headworks facility would require about the same number of personnel as the existing headworks facility. Therefore, projected numbers of District personnel listed on page 3-32 of the PEIR would not change substantially and would not result in increased daily employee vehicle trips. Operations of the headworks would result in fewer daily trips to the treatment plant than required during

the years of its construction. The new headworks would not substantially increase traffic entering and leaving Treatment Plant No. 2.

Mitigation Measures

No mitigation measures are required.

Significance After Mitigation

Less than significant.

CHAPTER 4

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CHAPTER 5

ACRONYMS AND ABBREVIATIONS

ACOE	Army Corps of Engineers
ADT	Average Daily Traffic
AQMP	Air Quality Management Plan
bgs	Below Ground Surface
BMP	Best Management Practice
BOD	Biochemical Oxygen Demand
CAA	Clean Air Act
CARB	California Air Resources Board
CBC	California Building Code
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CGS	California Geological Survey
CNEL	Community Noise Equivalent Level
CO	Carbon Monoxide
CWA	Clean Water Act
cy	Cubic Yards
dB	Decibel
dBA	A-Weighted Decibel
DISTRICT	Orange County Sanitation District

DIVISION	Division of Oil, Gas, and Geothermal Resources
DOT	Department of Transportation
EIR	Environmental Impact Report
EPA	United States Environmental Protection Agency
FEMA	Federal Emergency Management Agency
g	Acceleration due to Force of Gravity
gpd	Gallons per Day
GWRS	Groundwater Replenishment System
IERP	Integrated Emergency Response Program
L_{dn}	Day-Night Sound
L_{eq}	Equivalent Sound Level
L_{max}	Maximum Sound Level
L_{min}	Minimum Sound Level
L_{xx}	Percentile Exceeded Sound Level
LOS	Level of Service
mgd	Million Gallons per Day
mg/l	Milligrams per Liter
MMRP	Mitigation Monitoring and Reporting Plan
MPE	Maximum Probable Earthquake
mph	Miles per Hour
MT	Metric Ton
NAAQS	National Ambient Air Quality Standards
NO	Nitric Oxide
NO_2	Nitrogen Dioxide

NO_x	Nitrogen Oxides
NOP	Notice of Preparation
NPDES	National Pollutant Discharge Elimination System
O_3	Ozone
OCSD	Orange County Sanitation District
OCWD	Orange County Water District
OSHA	Occupational Safety and Health Administration
Pb	Lead
PCH	Pacific Coast Highway
PEIR	Program Environmental Impact Report
PM_{10}	Particulate Matter
$PM_{2.5}$	Particulate Matter less than 2.5 Microns
ROC	Reactive Organic Compounds
RWQCB	Regional Water Quality Control Board
SAR	Santa Ana River
SARI	Santa Ana River Interceptor
SARWQCB	Santa Ana Regional Water Quality Control Board
SCAB	South Coast Air Basin
SCAQMD	Southern California Air Quality Management District
SEIR	Supplemental Environmental Impact Report
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SPCC	Spill Prevention Containment and Countermeasure
SWMP	Storm Water Management Plan

SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	Toxic Air Contaminants
TMDL	Total Maximum Daily Load
TSS	Total Suspended Solids
UBC	Uniform Building Code
UBE	Upper Bound Earthquake
UST	Underground Storage Tank