EXHIBIT D – CHEVRON EL SEGUNDO MARINE TERMINAL LEASE RENEWAL PROJECT

STATEMENT OF FINDINGS

INTRODUCTION

These Findings address the significant environmental impacts identified in the Final Environmental Impact Report (EIR) prepared for the Chevron El Segundo Marine Terminal Lease Renewal Project (Project). The Project involves Chevron Products Company (Applicant) entering into a new 30-year lease of tide and submerged state lands offshore of the city of El Segundo, Los Angeles County, for continued operations at the El Segundo Marine Terminal (Marine Terminal). The Marine Terminal has been in operation since 1911 when the adjacent Chevron El Segundo Refinery (Refinery) that it serves opened. The Refinery is not located on State lands and is not subject to a lease from the CSLC. The proposed Project would involve continuing current operations with a one percent increase in throughput and implementing future maintenance activities as needed at the Marine Terminal through the year 2040.

The California State Lands Commission (CSLC) is making these Findings pursuant to the California Environmental Quality Act (CEQA) Guidelines (California Code of Regulations [CCR], Title 14, section 15091(a)), which states in part:

> *No public agency shall approve or carry out a project for which an EIR has been certified which identifies one or more significant environmental effects of the project unless the public agency makes one or more written findings for each of those significant effects, accompanied by a brief explanation of the rationale of each finding.*

All significant environmental impacts of the proposed Project identified in the Final EIR are included herein. The significance of each impact is classified according to the following definitions.

Class	Definition	Findings Required
I	Significant adverse impact that remains significant after mitigation	**Yes**
II	Significant adverse impact that can be eliminated or reduced below an issue's significance criteria	**Yes**
III	Adverse impact that does not meet or exceed an issue's significance criteria	No
IV	Beneficial impact	No

The Findings are:

1) Organized by EIR issue area (System Safety and Reliability [SSR], Water and Sediment Quality [WSQ], Biological Resources [BIO], Air Quality [AQ], etc.);

2) Numbered in accordance with the impact and mitigation numbers identified in the Mitigation Monitoring Program in the Final EIR (see Section 7.0 of the Draft EIR, with revisions in Section 7.0 of the Final EIR) (Findings may not be numbered sequentially, since impacts that are less than significant before mitigation (Class III) or beneficial impacts (Class IV) do not require Findings); and

3) Followed by a discussion of the facts supporting the Findings.

Pursuant to CEQA Guidelines section 15091(a), a Finding has been made for each significant impact (i.e., Class I or II) as to one or more of the following, as appropriate:

(1) Changes or alterations have been required in, or incorporated into, the Project that avoid or substantially lessen the significant environmental effect as identified in the Final EIR.

(2) Such changes or alterations are within the responsibility and jurisdiction of another public agency and not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by such other agency.

(3) Specific economic, legal, social, technological or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the Final EIR.

Whenever Finding (2) occurs, the public agencies with jurisdiction are specified. These agencies, within their respective spheres of influence, have the ultimate responsibility to adopt, implement, and enforce the mitigation discussed within each type of impact that could result from Project implementation. However, the CSLC, as CEQA Lead Agency, has the responsibility to ensure that the required mitigation measures are effectively implemented (Public Resources Code [PRC] section 21081.6). Other specified state, federal, regional, and local agencies may include, but are not necessarily limited to, the following:

- California Department of Fish and Game (CDFG), including CDFG's Office of Spill Prevention and Response (OSPR);

- California Coastal Commission (CCC);
- California Department of Transportation (Caltrans);
- California Office of the State Fire Marshal (CSFM);
- California Regional Water Quality Control Board (RWQCB);
- National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA NMFS);
- U.S. Army Corps of Engineers (ACOE);
- U.S. Coast Guard (USCG);
- U.S. Fish and Wildlife Service (USFWS);
- South Coast Air Quality Management District (SCAQMD);
- City of El Segundo and other local districts or jurisdictions.

Whenever Finding (3) is made, the CSLC has determined that sufficient mitigation is not practicable to reduce the impact to a less than significant level and, even after implementation of all feasible mitigation measures, there will or could be an unavoidable significant adverse impact due to the Project. The Statement of Overriding Considerations, as required by CEQA Guidelines sections 15092 and 15093, applies to all such unavoidable impacts.

These Findings are based on the information contained in the Draft and Final EIRs for the Project, information provided by the Applicant, and information gathered through the public involvement process, all of which are contained in the Project EIR administrative record as noted below. Mitigation measures are briefly described in these Findings; more detail on each mitigation measure is included in Final EIR.

The location of the administrative record is in the Sacramento office of the California State Lands Commission, 100 Howe Avenue, Suite 100-South, Sacramento, CA 95825.

EIR FINDINGS

CEQA FINDING No. SSR-1

EIR Section 4.1, SYSTEM SAFETY AND RELIABILITY		Class
Impact No.:	**SSR-1: Potential for Fires and Explosions**	**I**
Finding(s):	(1) Changes or alterations have been required in, or incorporated into, the Project that avoid or substantially lessen the significant environmental effect as identified in the Final EIR. (3) Specific economic, legal, social, technological or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the Final EIR.	

FACTS SUPPORTING THE FINDING(S)

The potential for fires, explosions, releases of flammable or toxic materials, or other accidents that could cause injuries, fatalities, or spills would be primarily associated with the flammable vapors and other flammable materials transported as cargo by tankers visiting the Marine Terminal. All tankers greater than a given size, as required by Title 46, Code of Federal Regulations (CFR) section 32.53, use gas blanketing systems, which substantially reduce the risk of fire and explosions by eliminating the availability of flammable vapors within concentrations that could allow ignition. Vessels lacking this technology primarily present this risk. A potential increase in vessel traffic at the Marine Terminal would further increase the risks (by increasing the frequency) of fires and explosions. The thermal footprint would not change under the proposed Project since larger vessels are not anticipated to visit the Marine Terminal. This would be considered a significant impact.

Mitigation Measure (MM) SSR-1a (Inert Gas Systems and Fire Response) requires the Applicant to extend the use of inert gas to all vessels (tankers and barges), if CSLC staff deems it feasible, that carry non-grade E cargo, to reduce the possibility of fires and explosions. The inert gas systems shall be in accordance with 46 CFR 32.53. Response planning documents shall address response equipment and fire boats that would respond to a fire at the offshore location. These documents shall be completed and submitted to CSLC staff within one year of lease approval and reports submitted to CSLC staff when changes are required to the document. This mitigation measure also requires the Applicant to conduct biennial, or more frequently as needed, fire and response drills with the El Segundo Fire Department as part of its emergency response preparedness training.

MM SSR-1b (Lease Modifications) requires the Terminal lease to contain a clause allowing the CSLC to add or modify mitigation measures in the event that cost-effective technologies become available that would significantly improve protection from fires or explosions if such technologies could be readily implemented during the lease term, as defined by "best achievable technology" (PRC section 8750(d)). "Lessons learned" modifications should be made if a fire or explosion occurs during the lease term.

Applying an inert gas system to all vessels would substantially reduce the frequency of a fire or explosion that could lead to personnel or public injuries, fatalities, or a spill. Although the risks of fire and explosions would not be eliminated, inert gas systems would reduce the frequency of these types of events by a substantial margin. The Port of Los Angeles (POLA) implemented requirements against venting of all hydrocarbons because of previous incidents that involved explosions and fires from cargo and fuel vapors. The International Maritime Organization (IMO) requires an inert gas system on all new tankers and most existing tankers 20,000 deadweight (metric) tons (DWT) and heavier (approximately 150,000 barrels [bbl]) (IMO 2009). Federal requirements (46 CFR 32.53) mandate inert gas systems on certain crude and product tankers above a given size and age that carry non-Grade E cargos. Grade E cargos are combustible liquids with an open cup flash point of 150°F (65.5°C) or higher. Common Grade E cargoes include Number 6 fuel oil, asphalt, lubricating oil, animal and vegetable oils, and oily waste water. Even with these federal requirements, a number of vessels (tankers and barges) that visit the Marine Terminal do not use inert gas systems.

It is important for the CSLC to be able to impose additional requirements that could make the transfer of cargo between the onshore facility and a vessel safer during the lease term. Improvements in technology and equipment are likely to occur over time, and the CSLC needs to be able to require improved equipment, as it becomes available, to lessen the threat of fires, explosions, and leaks from these operations.

Summary. This impact remains potentially significant following application of all feasible mitigation.

CEQA FINDING No. SSR-2

EIR Section 4.1, SYSTEM SAFETY AND RELIABILITY		Class
Impact No.:	**SSR-2: Potential for Spills**	**I**
Finding(s):	(1) Changes or alterations have been required in, or incorporated into, the Project that avoid or substantially lessen the significant environmental effect as identified in the Final EIR.	

	(3) Specific economic, legal, social, technological or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the Final EIR.

FACTS SUPPORTING THE FINDING(S)

The worst-case vessel traffic analysis indicates a potential increase in vessel calls to the Marine Terminal by the year 2040. Spill risks are based on both the number of vessel calls (the spill frequency) and the worst-case spill size. The frequency of a spill could increase with an increase in vessel calls. However, since the vessel sizes would not increase, the worst-case spill size would be the same as the current baseline operations and the modeling analysis presented would be the same under the proposed Project as the current baseline operations. Although many of the spills at the Marine Terminal are small, continued vessel traffic would continue to present the potential for spills to the ocean. This would be a significant impact.

MM SSR-2a (Pipeline Vacuum System) requires the Applicant to ensure that the pipeline vacuum system is operational and able to function at all times when the Marine Terminal is not loading. This shall be conducted within one year of lease approval and reported to CSLC staff.

MM SSR-2b (Pipeline Testing System) requires the Applicant to ensure that the following activities accompany all vessel and barge loading and unloading operations, and that these measures are incorporated in the emergency response plans, terminal operations plans, and vessel transfer procedures, as applicable: 1) the pipeline and hoses shall be pressure tested three times during each cargo transfer (once before the vessel or barge is connected, once after the vessel or barge is connected, and once after the vessel or barge is disconnected from the pipeline) and each pipeline pressure-checked monthly; 2) If the pressure cannot be maintained once the pipeline is pressured, then the system shall be placed under a vacuum and divers shall be mobilized to investigate the possible leak; 3) A line boat and tug shall be at the berth during all transfer operations to visually monitor for leaks; 4) A boat at the berth shall be equipped with at least 600 feet of boom for rapid response to a spill. Periodic drills shall be performed to demonstrate the ability to deploy and maneuver boom to the satisfaction of the CSLC staff and OSPR.

MM SSR-2c (Testing of Leak Detection Equipment) requires the Applicant, within one year of lease issuance and annually thereafter, to test the leak detection systems (including the vacuum system and systems to detect leaks while loading) by using bypass valves or other equivalent methods to verify the function of these systems, to ensure that the system is using the most recent technology, and to make adjustments as needed. Test reports shall be submitted to CSLC staff annually and shall include a discussion as to whether the system is using the most recent technology.

MM SSR-2d (Pipeline Leak Detection) requires that the Applicant, within one year of lease approval, to ensure that a leak detection system is in place during all transfer operations that can detect a leak of two percent of the flow rate within five minutes. This could involve the installation of flow meters at both the shipping and receiving ends of the loading pipelines that use a means of conducting automatic and continuous flow balancing, a pressure-type system, or other equivalent methods. Any deviations shall activate an alarm system at both the shipping and receiving locations.

MM SSR-2e (Double Hulled Vessels) requires that during the 30-year lease term, all vessels that call at the Marine Terminal shall be double hulled.

MM SSR-2f (Pipeline Inspections) requires that in addition to periodic inspections and surveys, within one year of lease approval, the Applicant shall implement smart-pig inspections, cathodic inspections of the entire pipelines, bathymetric surveys and visual inspections (either remote-operated-vehicle or camera-equipped diver to ensure a record of the inspection) of all Marine Terminal pipelines. The entire pipeline route and berths shall be visually inspected and bathymetric surveys conducted at least every three years or after major winter storms. At a minimum, visual surveys shall inspect unsupported free spans and vortex shedding, anchors and mooring lines, and other anomalies. Cathodic protection testing should be conducted per National Association of Corrosion Engineers SP0169. Close-interval cathodic protection testing should be conducted every three to five years to ensure that the cathodic protection system is operating correctly throughout the entire length of all the pipelines (onshore and offshore). Smart-pigging shall be conducted every three years or to the satisfaction of CSLC staff. Written results of each inspection in the form of a report shall be submitted to CSLC staff and pipelines repaired as necessary.

MM SSR-2g (Bow Tube and Thruster Leaks) requires that during the 30-year lease term the Applicant shall implement techniques to detect bow tube and thruster leaks for all vessels.

MM SSR-2h (Motor Operated Valve System) requires that during the 30-year lease term the Applicant shall ensure that the motor operated valve control system is reliable through testing and maintenance procedures, as indicated in past process hazards reports, and the results of testing shall be submitted to CSLC staff annually.

MM SSR-2i (Automatic Identification System Shipboard Equipment) requires that during the 30-year lease term all vessels calling at the Marine Terminal shall be equipped with shipboard automatic identification system equipment.

MM SSR-2j (Berm and Drainage at Onshore Marine Terminal) requires the Applicant to install drain/sump protection in the form of sealable coverings, valves, drainage procedures or other methods to prevent flow of spilled oil through the drains/sumps at the onshore areas of the Marine Terminal to the environment. The drain/sump protection would prevent a spill of material at the loading pumps or other Marine Terminal equipment from entering the drains/sumps and thereafter affecting the ocean. All areas of the onshore Marine Terminal shall be protected by berms that can contain a worst-case discharge from the pumps or pipelines, including potential drain-down from Refinery tankage. Onshore pipelines shall be protected from vehicle impacts. These protections shall occur within one year of lease approval and a report shall be submitted to CSLC staff including drain/sump descriptions and measures taken and a survey of the onshore areas with spill capture volumes.

MM SSR-2k (Pipeline Maintenance) requires that within one year of lease approval the Applicant shall ensure that the recommendations from all previous Hazards and Operability (HAZOP) studies and the cathodic protection system reports are implemented. HAZOP studies shall be updated as required by the U.S. Environmental Protection Agency (EPA) or Occupational Safety and Health Administration (OSHA) and reports submitted to CSLC staff.

The vacuum leak detection system is used when the Marine Terminal pipelines are not loading or unloading materials. The system operates by applying a slight vacuum on the pipelines when they are not in use. If a leak develops in the pipeline while the vacuum is applied, the system would not be able to maintain a vacuum and an alarm would sound. According to the 2005 Process Hazards Analysis (PHA), the vacuum leak detection system required some troubleshooting and was not operational. Ensuring that the system is continuously operational would ensure quick detection of leaks and a response to minimize the size of a leak and the extent of potential damage.

Conducting pressure tests on the pipeline before and after each transfer operation would help to ensure that the integrity of the pipeline is intact before each transfer.

Chevron indicates that they currently do this; however, since it does not appear to be a requirement, it is identified as a mitigation measure.

Pre-booming vessels during on/off-loading operations at the Marine Terminal was considered and ruled out as it is not practical for a number of reasons. While a ship is in the moorings, eight mooring lines run from the ship to eight mooring buoys to hold the ship in place. The buoys are in a circular pattern around the ship; each approximately 500 feet from the ship. It is not possible to encircle the ship while it is tied up in the moorings since the mooring lines from the buoys to ship would interfere with the boom boat. A boom boat cannot run under the mooring lines to deploy the boom. The Applicant would need to deploy the boom outside the buoys to pre-boom and encircle the ship, which would require a circle of boom whose length (circumference) would be approximately 4,700 feet.

In addition to the long length of boom, pre-booming outside the mooring lines would create additional problems. Wind, seas, swell and current would prevent the boom from remaining in place around the buoys. Moreover, if the swell and/or wind increased, the boom could jump over the buoys, entangling the boom and mooring lines and rendering the boom useless. Oil containment boom is also not designed to rub up against mooring buoys, which would be inevitable even in calm weather. Booming outside the mooring lines would damage the boom and it would be ineffective in containing spilled oil.

Weather, wind seas, swell and current are constantly changing and impact every ship that comes into the mooring differently. In the event of a spill, response operations need flexibility, and the option to move resources to adjust to these changing conditions. Mooring at the Marine Terminal is completely different from mooring inside a harbor at a facility where pre-booming makes sense from a spill response viewpoint and is required.

However, a boat equipped with a boom at the berth location, instead of in Marina Del Rey or King Harbor, would allow quicker booming and response times. The boom could be on one of the tugs or line boats that would provide visual inspections during transfer operations. Six-hundred feet of boom, the minimum required by 14 CCR 844 and OSPR, would enable effective response to small spills. For larger spills, booms are available on response vessels in Marina Del Rey and King Harbor, at the Chevron Refinery, and at the POLA/Port of Long Beach (POLB).

The pressure point analysis (PPA) system described by Chevron in its Application operates by monitoring pressures at different points in the pipeline systems. The current PPA system was installed several years ago and has, as recently reported by

Chevron, been ineffective due to variations in flows associated with normal transfer operations. More refined techniques or installing additional pressure sensors, or different types of pressure sensors, and flow information might increase system response and improve effectiveness. The system should be thoroughly redesigned with new equipment, such as flow meters or other equivalent devices installed, to ensure that a leak during transfer operations could be detected at a given level of accuracy. Ensuring that the system is as efficient as possible would ensure quick detection of leaks and a response to minimize the size of a leak and the extent of potential damage.

Periodic testing of leak detection systems help to ensure they function as necessary. This should involve testing actual components with a leak simulation by opening bypass systems to reduce the flow or pressure at various points in the system, for example. Operating leak detection systems would ensure quick detection of leaks and a response to minimize the size of a leak and the extent of potential damage.

Numerous onshore and offshore pipeline systems use supervisory control and data acquisition (SCADA) flow balancing to ensure that small leaks are detectable. By continuously monitoring flows into and out of a system and comparing total flows, this balancing system ensures that no loss occurs. The Marine Terminal currently conducts this type of comparison; however, the Terminal only periodically uses manual tank measuring devices during the transfer process. The current system could provide the required accuracy (the CSLC's Marine Oil Terminal Engineering and Maintenance Standards [MOTEMS] specifies a two percent accuracy over five minutes), but may need to be upgraded for more continuous or frequent monitoring. Continuously ensuring all materials leaving a vessel are actually received at the onshore tank farm would guarantee quick detection of leaks and a response to minimize the size of any leak and the extent of potential damage. In addition, when vessel loading times extend into nighttime or the area is foggy with reduced visibility, a leak detection system that does not rely on visual inspection could reduce the response time to a leak.

Current regulations require replacement or conversion to double-hulled configuration of large tankers by 2010 and smaller tanker barges barge by 2015. Data from the U.S. Department of Transportation (USDOT) indicate that more than 80 percent of crude and product tankers that call at U.S. ports were double hulled in 2007. Chevron indicates that more than 90 percent of vessels that call at the Marine Terminal are double hulled. Double-hulled vessels have a lower frequency of spills because of the added protection of the double hull provides in a grounding, collision, allision, or bottom puncture. Data from the Federal Emergency Management Agency (FEMA) indicate that larger spills occur five times less frequently for double-hulled vessels than for single-hulled vessels (FEMA 1989). Studies conducted to assess the effectiveness of the Oil Pollution Act of 1990 indicate that "in the event of an accident involving a collision or grounding, an effectively designed double-hull tanker will significantly reduce the expected outflow of oil compared to that from a single-hull vessel" (including barges) (Marine Board 1998a). As a note, the study did not find this to be true of double-hulled vessels with single-tank-across cargo tank configurations.

The USCG Programmatic Regulatory Assessment evaluated the effectiveness of double hull requirements (USCG 2001). Overall, the assessment found that double-hull requirements will reduce the number of spills for tankers and barges by 13 percent and 16 percent and the volume of oil spilled by 21 percent and 22 percent in the future, respectively.

Requiring all tankers, including larger vessels and smaller barges, to convert to double hulls before required by regulations would reduce the risk of an oil spill.

Smart-pig technology involves passing a device through a pipeline. The device, the smart pig, is equipped with sensors that detect corrosion, dents, cracks, and other potential defects in a pipeline. Smart pigs enable early detection of situations that could lead to a pipeline spill. Smart pigs currently inspect some Marine Terminal pipelines. The Berth 3B main pipeline was most recently inspected in September 2005. Smart pigs cannot inspect the 14-inch (35.6-centimeter [cm]) pipeline to Berth 4 because bends in the pipeline prevent the pig's passage; the pipeline would need to be modified to be inspected by smart pigs. Regularly smart-pigging all the pipelines would reduce the frequency of spills from pipeline defects.

The 2005 PHA determined that there currently is not a method to detect leaks from vessel bow tubes and thrusters. Implementing a method, through booming or other detection technique, would reduce the frequency of spills from bow tubes and thrusters.

Vessels carrying Alaska crude oil from Alaska are equipped with required Automatic Identification System (AIS). This equipment automatically relays a vessel's position and traveling information to the Vessel Traffic and Information Service (VTIS). This enables the VTIS to use AIS instead of radar, which can be less accurate in some conditions, including inclement weather. Requiring all vessels that call at the Marine Terminal to carry AIS equipment would reduce the frequency of vessel collisions, allisions, and groundings by ensuring the VTIS has accurate information on vessel positions at all times.

A spill at the onshore area of the Marine Terminal could drain to the ocean through existing area drains/sumps or directly over the ground surface to the beach area. Ensuring that all drains/sumps are protected in the event of a spill and that any spill from pipelines or equipment would be contained within berms would decrease the frequency of uncontained spills at the onshore Marine Terminal location.

The 2008 cathodic protection surveys on the Marine Terminal recommendations are listed in the mitigation measure (Farwest 2008). However, the offshore pipelines have not been assessed for cathodic protection. Implementing the recommendations and surveying the offshore pipelines would reduce the frequency of pipeline spills and enhance the preventative maintenance of the pipeline and terminal systems.

Since numerous reporting requirements are associated with the maintenance and testing mitigation measures, a reporting program shall be developed and submitted to CSLC staff that includes one-time and annual status reporting.

Summary. This impact remains potentially significant following application of all feasible mitigation.

CEQA FINDING No. SSR-3

EIR Section 4.1, SYSTEM SAFETY AND RELIABILITY		Class
Impact No.:	**SSR-3: Disturbance of Potentially Contaminated Seafloor Sediments**	**II**
Finding(s):	(1) Changes or alterations have been required in, or incorporated into, the Project that avoid or substantially lessen the significant environmental effect as identified in the Final EIR.	

FACTS SUPPORTING THE FINDING(S)

The proposed Project could require pipeline maintenance, or, for replacement and smart-pigging of the Berth 4 pipelines, would require maintenance in the near-term, which in turn could disrupt sea floor sediment in Santa Monica Bay. Sediment with concentrations of metal or organics exceeding regulatory values for hazardous waste (established in CCR Title 22) may be disturbed and suspended during rearrangement of the sea floor pipelines or replacement of these pipelines, and then redeposited at other locations. If these sediments contain toxic levels of contamination, suspending and redepositing these contaminants could result in significant adverse impacts.

MM SSR-3 (Sampling Program for Sediments Within the Proposed Project) requires that 60 days prior to the start of any major planned offshore construction (ongoing during construction, as applicable, but excluding routine inspection, maintenance, and repair) that would disturb sediments, the nature of potential contamination within these sediments shall be defined. Samples should be collected and analyzed, and results summarized in a report to CSLC staff. This report should include, at a minimum, recommendations to minimize disruption of any identified contaminated sediments, including removal if necessary. Sediments disturbed during construction that were found to be contaminated shall be appropriately managed prior to conducting any offshore activities.

By incorporating site-specific sediment analysis from the areas that could be impacted by pipeline maintenance or replacement over the life of the Project, impacts from future activity can be reduced.

Summary. With the mitigation described above, the impact is reduced to a less than significant level.

CEQA FINDING No. WSQ-1

EIR Section 4.2, WATER AND SEDIMENT QUALITY		Class
Impact No.:	**WSQ-1: Oil Spills**	**I**
Finding(s):	(1) Changes or alterations have been required in, or incorporated into, the Project that avoid or substantially lessen the significant environmental effect as identified in the Final EIR. (3) Specific economic, legal, social, technological or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the Final EIR.	

FACTS SUPPORTING THE FINDING(S)

Spills of petroleum products during loading and unloading operations at the Marine Terminal, or from a tanker vessel in transit to shipping lanes, would pollute water with toxic substances and violate aesthetic water-quality objectives for the preservation of beneficial uses.

Potential increases in the number of vessel calls at the Marine Terminal over the Project life proportionally increase the probability of an accidental oil spill during transfer operations at the Terminal and during vessel transit to and from shipping lanes. Depending on the size of the spill, and weather conditions at the time of the spill, a spill of crude oil or refined petroleum products would adversely affect marine water quality, and possibly sediment quality over wide areas. The magnitude and extent of spill effects were estimated from oil-spill modeling of incidents that could potentially occur at the Marine Terminal or in transit to the Terminal. The spill scenarios included a range of spill sizes, oil types, weather conditions, flow directions, release rates, and spill sources.

Regarding spill dynamics, the severity of sediment and water-quality impacts depends on the properties and volume of the material spilled, the prevailing weather conditions, and the speed and efficacy of the spill-response and cleanup effort. Oil properties affecting water quality include the material's density, viscosity, vapor pressure, maximum water content, and aromatic content. Modeling evaluated the fate of three petroleum products. Napo crude is the most dense and viscous and has a much lower vapor pressure and aromatic content than Arabian light crude. Because of its lower evaporation rate and higher emulsifier content, it would remain on the sea surface longer than the lighter crude. On the other end of the scale, volatile compounds constitute more than 60 percent of refined products, such as diesel fuel exported from the Terminal. Spill modeling incorporated these differences in oil properties, and differences in the modeling results reflect their differing effect on the fate of the oil in the marine environment.

In addition, the fate of the spilled oil and its effect on marine water quality is a function of the physical processes that prevail during and after the spill. These processes change over time after the initial release, as do the associated water-quality impacts. Again, modeling accounts for these changing processes, which include transport by winds and currents, gravitational spreading, deposition, and weathering. Spreading of oil on the sea surface dominates during the first six to ten hours following an oil spill, while evaporation and other weathering processes remove the majority of the most volatile compounds within the first 24 hours. Depending on the type of oil, up to half of the spill volume can be lost to evaporation or dissolution during the first 48 hours. Products such as light diesel oil, kerosene, and gasoline can evaporate completely within the first 24 hours of a spill. Because of these differential removal processes, heavier oil constituents have a longer residence time and tend to induce more lasting water-quality impacts.

Spill modeling predicts potential water-quality impacts to the water column by estimating the spatial extent of dissolved polycyclic aromatic hydrocarbons (PAH) concentrations exceeding 1 part per billion (ppb). The 1-ppb threshold for evaluating water-quality impacts from dissolved-aromatic concentrations is based on a conservative biological-effects level for sublethal exposure to PAH over durations likely to be encountered during a spill (Appendix C.2.4.3, Toxicity Thresholds of Concern). The water-quality numerical objective for PAH in the Ocean Plan is 0.0088 ppb averaged over 30 days

(SWRCB 2005a). In terms of PAH dose, this is equivalent to an exposure level of 6 ppb-hour, wherein adverse biological effects are expected from either an acute exposure to a PAH concentration of 6 ppb for one hour, or an exposure to the sublethal concentrations of 1 ppb for a period longer than six hours.

Seafloor sediment quality can be impacted by hydrocarbon contamination when sinking and sedimentation removes oil constituents from the water column. Sinking and sedimentation of oil results from sorption on sinking detrital particulates, ingestion of hydrocarbons by zooplankton, and weathering-induced increases in the specific gravity of oil droplets. However, major impacts to seafloor sediments from an oil spill are likely to occur only during periods of high turbidity, for example, during an infrequent major stormwater-runoff event. Sedimentation of oil becomes significant when ambient suspended-sediment concentrations exceed 100 milligrams per liter (mg/L). Average annual transmissivity near the Marine Terminal exceeds 65 percent, which represents a suspended-solids concentration of only 3.6 mg/L. Consequently, the vast majority of spills that could occur at or in transit to the Terminal are not likely to significantly impact subtidal sediment quality over widespread areas. Projected worst-case sediment fates are high, with as much as 35.9 percent of the spilled hydrocarbon mass settling on sediments. However, the most heavily impacted sediments lie within the extensive intertidal zone, where the shallow water depth and intense near-shore mixing promote deposition and entrainment of oil on and within shoreline sediments.

In contrast to shoreline impacts, most marine oil spills do not severely degrade open-ocean water quality except during, and for a few weeks after, the spill. As previously described, most of the components of crude oil are insoluble in seawater and, because the spill floats on the sea surface, impacts to the water column and seafloor are limited. In addition, the most toxic aromatic hydrocarbons, benzene and toluene, evaporate quickly as the spill weathers in the marine environment. Thus, mortality of marine organisms arising from the physical effects of smothering and coating is of greatest concern from weathered oil on the open ocean, not chemical toxicity.

Regarding floating oil, Oil Spill Modeling predicts the fate and effects of oil spilled at and in transit to the Marine Terminal for a variety of potential spill scenarios. Worst-case impacts to the sea surface from an oil slick, and to the water column from dissolved aromatics, are evaluated separately, as are the fates of three different types of petroleum products: diesel, Arabian light crude, and Napo heavy crude.

The worst-case diesel spill of 11,000 bbl at the Marine Terminal would generate a visible surface slick with a greater than 50 percent probability of extending shoreward from the Terminal between Marina del Rey and King Harbor. The diesel-oil slick also has a tangible probability, greater than 10 percent, of spreading offshore toward the west and impinging on the mainland coast of the Santa Barbara Channel or Northern Channel Islands, depending on the season. Much of the surface waters within the northern Southern California Bight (SCB) have at least a small likelihood of encountering surface slicks from the modeled spill.

Visible surface slicks generated by a crude oil spill during offloading at the Terminal would spread over a geographic footprint similar to that of a diesel spill, but with reduced encounter probabilities. This is the case even though the maximum crude volume released in the model was 10 percent larger than the maximum diesel spill. Because of its reduced gravitational spreading on the sea surface compared to diesel, a crude-oil spill during winter or spring has little tangible probability of producing a slick that extends much beyond the confines of Santa Monica Bay.

Modeling of surface slicks demonstrates that regardless of spill-origin (pipeline or tanker vessel), the type of oil spilled, or the meteorological and oceanographic conditions that prevail at the time of the spill, large-volume spills would produce widespread sheens with a high likelihood of being observed along the coastline of southern Santa Monica Bay. Without effective cleanup within two days, there is also a tangible risk that the slicks would spread well beyond the Bay and adversely affect water quality as far away as the Santa Barbara Channel. The slicks transported along this northwesterly trajectory pose a risk of impinging on the largest mainland Area of Special Biological Significance (ASBS Number 24), which extends from Pt. Dume to the eastern entrance of the Santa Barbara Channel.

With respect to dissolved hydrocarbons, in contrast to the physical, chemical, and aesthetic water-quality impacts associated with floating oil, impacts associated with hydrocarbon dissolution are limited to chemical contamination within the water column. Nevertheless, as with floating oil, the concentration and extent of dissolved-hydrocarbon contamination are a function of the type of oil spilled, the sea state, and the transport and mixing of the oil by meteorological and oceanographic processes that prevail at the time of the spill. Because most other aromatic hydrocarbons evaporate at the sea surface, PAH is the dissolved hydrocarbon contaminant of greatest concern within the water column, and, as discussed previously, a water-quality concentration of 1 ppb represents a conservative threshold for biological effects for exposure durations that are possible with large spills.

In contrast to water-quality impacts from floating oil, perceptible dissolution of PAH within the water column tends to be temporary, localized, and restricted to a specific combination of spill conditions. The maximum diesel spill from a pipeline at the Marine Terminal would introduce dissolved aromatic concentrations that exceed the 1 ppb threshold less than half the time (41 percent) for a range of weather and oceanographic conditions.

During the worst-case scenario for PAH exposure to the water column from a diesel spill originating in a Terminal pipeline, concentrations of dissolved aromatics greater than 1 ppb were predicted to occur in the nearshore zone, inshore, and downcoast of the of the spill origin. Dissolved aromatic doses as high as 60 ppb-hour were projected to occur within a highly localized area during this release scenario. Doses exceeding 6 ppb-hour, the equivalent of the Ocean Plan's numerical objective, were projected to cover a nearshore area of 4.2 square miles (10.9 kilometers $[km]^2$).

Regardless of the low impact probabilities for any given coastal region, a large release of diesel would probably result in water-column PAH levels somewhere that exceed many of the criteria listed as significance criteria. In contrast, a crude-oil spill of similar volume would result in much smaller PAH exposures to the water column. Dispersion and dissolution of PAH into the water column is initially limited by crude oil's higher viscosity and later by its tendency to emulsify, which further limits PAH loading to the water column because of the associated increase in viscosity and buoyancy of the surface slick. As a result, spills of Arabian light crude would induce PAH concentrations exceeding 1 ppb only half as often as diesel spills, and none of the modeled Napo heavy crude spills generated significant dissolved PAH concentrations within the water column.

Nevertheless, modeling of PAH dissolution into the water column demonstrates that large-volume diesel spills near the coast have a high likelihood of significantly impacting nearshore water masses, both along the coastline of southern Santa Monica Bay and near the rocky shoreline of the Palos Verdes Peninsula. This is true regardless of spill origin (pipeline or tanker vessel) or the meteorological and oceanographic conditions that prevail at the time of the spill. Without effective cleanup within a week, there is also a tangible risk that coastal waters within the western Santa Barbara Channel would experience deleterious PAH doses, including areas within the Channel Islands National

Marine Sanctuary (CINMS) and ASBS Number 24. Diesel spills farther offshore during transit to the shipping lanes, and spills of crude oil, particularly heavy crude, are less likely to generate excessive doses of PAH contaminants within the water column.

Implementing **MMs SSR-2a through SSR-2k** would reduce the frequency and impacts of spills by decreasing detection times and increasing response capabilities. This process shall occur within one year of lease approval and reports submitted to CSLC staff annually thereafter.

Implementing these mitigation measures would reduce the likelihood and volume of an accidental oil spill, along with its attendant impacts to marine water and sediment quality. Ensuring that vacuum-leak-detection systems are operational **(MM SSR-2a)**, that pipeline testing accompanies all vessel and barge loading/unloading operations and that a barge with sufficient boom is onsite **(MM SSR-2b)** will provide for more reliable detection of smaller pipeline leaks and a faster response time at the Marine Terminal in the event of an accident that results in a spill. Similarly, more accurate and frequent pipeline flow measurements **(MM SSR-2d)** could substantially reduce response time to a pipeline leak during cargo transfer, especially one that is not apparent on the sea surface during periods of limited visibility. Conducting and reporting of external visual and internal smart-pig inspections, along with increased attention to cathodic protection systems, would ensure that the pipelines are reliable **(MMs SSR-2f and SSR-2k).** Although a leak from a pipeline within the onshore portion of the Marine Terminal is unlikely to reach the shoreline and impact marine water quality, constructing berms **(MM SSR-2j)** and implementing a reliable motor-operated-valve control system **(MM SSR-2h)** would reduce the frequency and volume of potential onshore spills, thereby reducing the likelihood that the spill would reach the surfzone or impact sediments.

Spills from tanker vessels could be reduced by accelerating the use of double-hulled vessels **(MM SSR-2e)** and by implementing methods to detect leaks from bow tubes and thrusters **(MM SSR-2g)**. The likelihood of spills from a tanker vessel collision or allision in transit to the Marine Terminal would be reduced if it all vessels were equipped with Automatic Identification System shipboard equipment that transmits the vessel's exact position to the Los Angeles-Long Beach VTIS for monitoring **(MM SSR-2i)**.

Marine water-quality impacts associated with the increased risk of accidental oil spills are categorized as significant (Class I) because the proposed mitigation measures would not be completely effective in reducing the significant risk of a spill, nor would they adequately eliminate the significant effect of a large spill on marine resources. A spill of more than a few barrels would violate many of the water-quality standards and have a deleterious effect on the marine environment and biota. Such a spill would generate visible surface sheens, significantly reduce the penetration of natural light, reduce dissolved oxygen, degrade indigenous biota, and result in hydrocarbon contamination within the water column and marine sediments. The duration and area of the impact would be largely dictated by the size and location of the spill and various physical conditions of the sea at the time of the spill. Impacts would last from days to weeks and extend for tens of miles.

Regarding spill response, mitigation of water-quality impacts from a major marine oil spill is largely a function of the efficacy of the spill response measures. The effectiveness of spill cleanup measures is dependent on the response time, availability, and type of equipment, size of the spill, as well as the weather and sea state during the spill. Only some of these aspects are within the control of the spill-response team.

In addition, some oil-spill countermeasures, such as the use of dispersants, have water-quality impacts of their own, including the introduction of chemical contaminants and increased PAH dose within the water column. Because there are limitations to thorough containment and cleanup of an offshore oil spill, potentially significant impacts to water quality remain, regardless of the capacity and responsiveness of the spill-cleanup infrastructure.

Legal requirements for spill-contingency planning, and the additional mitigation measures identified above, serve to ameliorate the likelihood and severity of spills associated with the Project. However, no feasible mitigation would eliminate significant impacts to water quality from most additional accidental oil spills that could occur because of a potential increase in vessel calls at the Marine Terminal. Reasonable worst-case spill volumes would generate widespread slicks and localized toxic PAH doses to the water column well in excess of the applicable significance criteria. Spill containment, recovery, and other countermeasures may not be timely enough or comprehensive enough to reduce potential water-quality impacts below the significance thresholds. Under certain conditions, contamination could spread into sensitive coastal regions, including the CINMS and its associated reserves, ASBS Number 24 west of Point Dume, and the five critical coastal areas that lie along the central and northern reaches of the Santa Monica Bay coastline. Thus, the potential increase in oil spills that could occur as a result of the proposed Project would generate significant and unavoidable impacts to marine water quality. Impacts to water quality from an oil spill would remain significant until oil has been eliminated from the water surface. Significant water-quality impacts from toxic concentrations of dissolved aromatic compounds would last until PAH compounds dissipate from the water column, which is projected to occur over periods of several hours to a day.

Summary. This impact remains potentially significant following application of all feasible mitigation.

CEQA FINDING No. WSQ-2

EIR Section 4.2, WATER AND SEDIMENT QUALITY		Class
Impact No.:	**WSQ-2: Disturbance of Seafloor Sediments**	**II**
Finding(s):	(1) Changes or alterations have been required in, or incorporated into, the Project that avoid or substantially lessen the significant environmental effect as identified in the Final EIR.	

FACTS SUPPORTING THE FINDING(S)

Turbidity and contaminant concentrations within the water column could increase from seafloor sediments that are resuspended by propeller wash or the maintenance and replacement of mooring equipment and pipelines. More than 90 percent of the surficial sediments within Santa Monica Bay contain contaminants deposited by point-source discharges over the last century. These legacy pollutants are largely dichlorodiphenyl-trichloroethane (DDT) and polychlorinated biphenyls (PCBs), although metals, other pesticides, and hydrocarbons also have low water-solubility that causes them to adhere to particulate matter and eventually settle to the bottom of the Bay.

The Project's offshore activities could disrupt the Bay's sediments, thereby dispersing contaminants within the water column and increasing their bioavailability. Even if the resuspended sediments are not contaminated, they could temporarily increase water-column turbidity and reduce the penetration of ambient light, resulting in a possible exception to the Ocean Plan's narrative objective for water clarity. However, National Pollutant Discharge Elimination Permit (NPDES) monitoring of seafloor sediments below much of the Marine Terminal indicates that the sediments are largely uncontaminated compared to other areas of the Bay, and that their physical properties would result in only temporary and localized turbidity increases.

Much of the seafloor shoreward of the Terminal Berths is regularly monitored as part of the requirements in the NPDES discharge permit issued to the Refinery. Results from this long-term monitoring program demonstrate that sediments at benthic-monitoring Station RW16, which is closest to the berths, have contaminant concentrations below levels of biological or regulatory concern. A decade-long sediment-chemistry record shows that trace-metal concentrations at this site were generally below mean concentrations found within sediments throughout the SCB and well below sediment-quality guidelines that would characterize the sediments as toxic to marine organisms. Similarly, no detectable concentrations of synthetic organic contaminants, including DDT, PCB, and PAH congeners, were found within recent sediment samples collected at any of the benthic-monitoring stations.

Nevertheless, an elevated mercury concentration was measured at Station RW6, inshore of the Terminal berths, in 2007. If nothing else, the occurrence of this anomalous measurement suggests that sediment contaminant concentrations can vary significantly over time within the confines of the Marine Terminal. This, coupled with the fact that contaminant concentrations in sediments beneath the Terminal berths have not been measured, suggests that additional sediment sampling and analysis is warranted as part of the proposed Project (see **MM SSR-3**) or when curved sections of the Berth 4 pipeline are replaced to allow the passage of smart pigs (**MM SSR-2f**). With the exception of pipeline repair, replacement, or repositioning, offshore sediment-disturbing activities associated with the Project are most likely to occur beneath the Terminal berths, for example, from relocating the mooring anchors or pipeline end-manifolds.

Investigation of sediment contaminant concentrations beneath the Terminal berths is also reasonable because the seafloor has experienced substantial scour from tanker propeller wash, especially beneath Berth 4. The Terminal Operations Manual restricts use of tanker-vessel propellers while moored, except for turning by jacking gear. The Mooring Master gives clearance to turn the propeller for departure after the transfer hose is disengaged and returned to sea. Nevertheless, during mooring and unmooring, propeller wash has excavated approximately 0.5 million cubic yards (388,277.4 meter $[m]^3$) of sediment from the seafloor near the berths.

Sediment resuspension during mooring and unmooring operations could impact water quality in two ways: by increasing turbidity and by mobilizing any contaminants that reside within sediments into the water column. Sediment quality could also be affected if the suspended sediments were re-deposited in an area with less contamination. However, it is unclear whether the Project would result in additional erosion beyond what has already occurred. Although an increase in vessel calls might be expected, the additional vessels are likely to be smaller and less prone to erode seafloor sediments with propeller wash. Reduced scour from smaller tankers explains the existing difference in erosional footprints beneath the two berths. Berth 3 accommodates smaller vessels, between 8,000 and 123,000 DWT, whereas the vessels that call on

Berth 4 are generally larger, from 35,000 to 188,000 DWT. Largely because of a much deeper scour depth, the volume of excavated sediment beneath Berth 4 is six times greater than Berth 3.

Although increased seafloor scour may not result from the Project, it could induce scour in a different location, where sediment contamination also differs. Relocation of the scour pits could arise because of differences in the position of a shorter vessel's propellers relative to the berths or if moorings are relocated. Perceptible changes in the seafloor beneath the berths already occur, as is apparent from the differences observed in high-resolution bathymetry documented by period surveys (Fugro 2004, 2007).

While mobilization of contaminated sediments, either from propeller scour or from pipeline and mooring maintenance, represents a potentially significant water-quality impact, impacts from increases in turbidity are likely to be less significant. Turbidity increases from the Project activities will be localized and temporary. Because seafloor sediments within the Marine Terminal consist of well-sorted sands, nearly all suspended particulates would settle out of the water column in less than 1.5 hours. During that time, suspended particulates could be transported up to 1.5 miles by the daily peak tidal flow. However, any initial turbidity increase would become imperceptible long before the last sediment particle settles on the seafloor. This is especially true because the transport is likely to parallel the shoreline, where ambient seawater clarity is naturally lower and far more variable than in the center of Santa Monica Bay.

MM SSR-3 (Sampling Program for Sediments Within the Proposed Project) requires sampling and chemical analysis of surficial sediments likely to be disturbed by Project activities and, if contamination is found, limiting their disturbance.

MM WSQ-2 (Sediment Sampling Within Scour Areas) requires the Applicant to chemically analyze sediment samples collected from within the propeller-wash scour areas beneath Berths 3 and 4; if contaminant concentrations exceed biological effects thresholds, the Applicant shall remediate the contamination or move the Berth to uncontaminated areas. The field sampling and analysis program shall be performed at least once for the existing berth locations and written reports shall be submitted to CSLC staff in accordance with **MM SSR-3** 60 days prior to the start of any construction and shall be ongoing during construction (as applicable). Additional sediment sampling, analysis, and reporting shall be conducted within projected scour areas whenever the berths are relocated more than 500 feet (152 m) from their present locations.

Site-specific sediment analysis and limiting the disturbance of contaminated sediments will reduce or eliminate mobilization of the contaminants into the water column. Identifying areas that could potentially contain contaminated sediments, determining the levels of contamination within those sediments, and avoiding their disturbance or removal altogether would prevent the Project's activities from spreading those contaminants, leaving little or no impact from legacy contaminants. Degradation of water quality could still arise from increased turbidity, but those impacts would be temporary and localized, and affect coastal water clarity to a much smaller degree than naturally occurring turbidity plumes that arise from wave-induced resuspension, phytoplanktonic blooms, and stormwater outflow. By applying mitigation to prevent the spread of legacy contamination within sediments, the Project's impacts resulting from seafloor disturbance can be reduced to a level of insignificance.

Summary. With the mitigation described above, the impact is reduced to a less than significant level.

CEQA FINDING No. BIO-1

EIR Section 4.3, BIOLOGICAL RESOURCES		Class
Impact No.:	**BIO-1: Oil Spill Impacts to Marine Biological Resources**	**I**
Finding(s):	(1) Changes or alterations have been required in, or incorporated into, the Project that avoid or substantially lessen the significant environmental effect as identified in the Final EIR. (3) Specific economic, legal, social, technological or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the Final EIR.	

FACTS SUPPORTING THE FINDING(S)

An accidental discharge of petroleum hydrocarbons into marine waters would adversely affect biological resources, including increased exposure risks and impacts to biota and habitats from both the spill, and cleanup and remediation activities. Oil spills to the marine environment have the potential to significantly impact many components of the ecosystems within Santa Monica Bay and the SCB, in part because they can spread rapidly over great distances, and are difficult to detect and cleanup.

The extent to which an oil spill can inflict long-term damage on biological communities depends on a variety of factors including the size and location of the spill, and chemical composition of the material involved, as well as ambient environmental conditions like weather and sea state. Small leaks or spills that could be contained offshore and remediated quickly would likely have minor or negligible impacts on biological resources. In contrast, large spills, such as pipeline or vessel ruptures, would substantially increase the potential for long-term impacts on biological resources. Impacts to biological resources would be particularly significant if spills were to enter estuaries, or contact shorelines where wetland habitat or critical habitat for sensitive species occurs.

Aquatic biota are primarily exposed to dissolved hydrocarbons from oil, although microdroplets of oil dispersed in the water may also affect organisms. The toxicity of oil depends on exposure; solutions of soluble aromatic compounds in crude oil (i.e., 1- to 3-ring aromatics) are generally toxic to marine organisms at concentrations of 0.005 to 100 parts per million (ppm), depending on the mixture of compounds in the source oil and dissolved into the water. Sensitivity to oil hydrocarbons varies by species and life history stages (French McCay 2002).

Oil represents a physical as well as a chemical hazard to benthic organisms, with impacts occurring through both physical smothering and hydrocarbon toxicity. Sessile species, such as barnacles, may be smothered while mobile animals, such as amphipods, may be immobilized and glued to the substrate or trapped in surface slicks in tidepools. In addition the potential severity of oil spill impacts to benthic organisms also varies according to the degree of weathering of the oil. Fresh, unweathered oil contains higher amounts of the more-toxic aromatic hydrocarbons that may be readily accumulated by benthic organisms. Hence, the potential impacts of spilled oil to benthic communities are considered to be significant.

The likelihood of benthic sediments within the subtidal zone becoming contaminated is dependent upon wave/tidal action. If wave/tidal action is substantial, then contaminated sediments, including planktonic fecal pellets, are less likely to settle out. However, in estuaries or the semi-enclosed Ballona Lagoon with limited wave/tidal action, it is more likely that contaminated sediments will accumulate and persist. Generally, impacts would be expected to be greatest in shallow waters (2 to 20 m), as exposure in deeper waters has been found to be minimal (e.g., the *North Cape* spill, French McCay 2003).

The severity and duration of impacts to the intertidal biota are, to a large part, functions of the biological and geomorphologic characteristic of the shoreline habitat. For example, Hancock hypothesized (1977) that organisms in the upper intertidal areas where the oil dries rapidly are more apt to be affected by physical effects of oil, such as smothering, whereas organisms in the lower intertidal are more exposed to the chemical toxic effects of the liquid petroleum and degradation compounds. For example, following the 1969 Santa Barbara oil spill, breeding rates in lower intertidal organisms *Pollicipes polymerus* (gooseneck barnacle) and *Mytilus californianus* (a mussel) were reduced, while reproductive rates in upper intertidal barnacles *Chthamalus fissus* and *Balanus glandula* (white acorn barnacle) were unaffected (Straughan 1971, Foster et al. 1971, Anderson et al. 1993).

Shoreline types in the immediate Project area consist primarily of exposed medium to coarse-grained sand beaches with limited areas of rocky intertidal habitat. Wave-cut platforms occur along the coast from Point Dume to Malibu Point and in the southern portion of the Santa Monica Bay between Flat Rock and Point Fermin. Because wave-cut platforms often have tide pool areas that are exposed during low tides, this habitat also contains plants and animals common to exposed wave-cut cliff tide pools (CDFG OSPR 1993). The exposed rocky intertidal is characterized by strong waves that restrict the growth of plants.

Similarly, wave-cut cliffs or seawalls are found along the shoreline from Point Dume to Malibu Point and from King Harbor to Point Fermin. This type of habitat provides substrate for the complex intertidal and shallow subtidal algal and invertebrate communities that include abalone, limpets, mussels, and snails. Exposed beach piers are considered to have a low sensitivity to oiling, although biota would be damaged or killed under heavy accumulations of oil (CDFG OSPR 1993). Both these habitats have high wave action that generally reduces the possibility of oil stranding and aids in its removal by natural processes.

The subtidal benthos of nearshore areas in the Santa Monica Bay is dominated by small infaunal invertebrates, particularly polychaete worms and crustaceans. An oil spill that results in high concentrations of dissolved hydrocarbons in the water and/or the incorporation of oil into the sediments would likely result in a species composition shift to invasive and opportunistic benthic fauna. It is likely that an oil spill would selectively impact more sensitive benthic species, such as filter feeding amphipods. This was, in fact, observed in the 2003 *North Cape* spill (French McCay 2003). An oil spill within Santa Monica Bay nearshore and coastal wetlands, which would occur under most of the prevailing conditions evaluated, would have significant impacts (Class I) to the soft-bottom subtidal benthos.

Laboratory studies, field enclosure studies, and field studies conducted during oil spills have shown that oil spills have measurable effects upon marine phytoplankton and zooplankton. Impacts to phytoplankton include mortality, reduced growth, and reduced photosynthesis, but will vary with respect to species present in the water column, the time of the year, and the chemical composition of the oil spilled. Oil spill impacts to plankton in semi-enclosed systems, including estuaries and wetlands would be expected to be significant.

The majority of fish data regarding oil effects have been obtained in the laboratory. Field data generally consist of reports on fish kills and some measurements of sublethal effects. Field data regarding effects other than massive fish kills are extremely difficult to obtain because of the difficulty in quantitatively sampling fish populations. In laboratory studies, typical responses to toxic hydrocarbon concentrations include a brief period of increased activity, followed by reduced activity, twitching, narcosis, and eventual death (NRC 1985). Sublethal effects include histological (tissue and cell) damage, altered physiological and metabolic patterns, decreased growth and reproduction, and vulnerability to disease (NRC 1985). Among fishes, benthic species are more sensitive than pelagic species, and intertidal species are the most tolerant (Rice et al. 1979). In general, early life stages of fishes, such as embryos and larvae, are more sensitive to petroleum hydrocarbons than later life stages.

Adult fish, due to their mobility, may be able to avoid or minimize exposure to spilled oil. However, there is no conclusive evidence that fish will avoid spilled oil (NRC 1985). Experiments with herring and cod larvae show that neither species actively avoided experimental surface slicks but instead reentered them (Wells 1982). Egg and larval stages would also not be able to avoid exposure to spilled oil. Because fish species can be economically important and because long-term loss can result from an oil spill, impacts to fish are considered to be significant.

Oil spills pose a significant threat to marine birds. Due to the migratory nature of many bird species, the severity of oil spill impacts on marine birds would depend on the time of the year, the species present, and their numbers. According to Holmes and Cronshaw (1977), these factors accounted for the relatively low number of marine birds (3,600) that were killed during the 1969 Santa Barbara oil spill.

Impacts to marine birds from a large oil spill in the vicinity of the Project area are considered significant. Specifically, for the modeled Marine Terminal oil spill scenarios (Appendix C), spills to the California mainland could result in significant impacts to marine birds, because conditions are such that the oil sweeps along the shore in shallow waters where nearshore species such as gulls, loons, grebes, and scoters are abundant. Because of the widespread distribution of waterfowl, an oil spill from October through about April would probably contact some portion of the population. Santa Monica Bay nearshore areas and coastal wetlands are used as critical feeding ground by several thousand waterfowl from late fall through spring. Substantial mortality of wintering waterfowl or loss of essential habitat would likely result from oil spills and would be a significant impact.

Marine mammals that could be impacted by an oil spill include cetaceans (whales and dolphins), pinnipeds (seals), and fissipeds (sea otters). Animals that are unable to avoid contact with oil could be impacted by fouling, inhalation, or ingestion that could result in sublethal or lethal effects.

It is unlikely that oil spills would substantially threaten cetaceans (NRC 1985). However, a massive oil spill could result in fouling of the baleen, toxicity from ingestion, respiratory difficulties, and irritation of membranes that contact oil. Although some observations suggest that cetaceans would avoid surfacing in oil slicks by staying submerged longer, other observations suggest that some cetaceans may not avoid oil-covered waters (NRC 1985). Oil does not tend to cling to cetacean skin as it does to the pelage (hair) of other marine mammal species. Should an oil spill occur in the Project area, the species that would most likely be impacted, depending on the time of year, are the gray, blue, humpback, and fin whales. Blue, humpback, and fin whales are presently listed as endangered species.

Although seals apparently have the ability to detect and avoid oil slicks, Cowell (1979) reported that breeding seals swam through oil to reach rookery beaches during the breeding season. Geraci and Smith (1977) reported that surface contact with oil has a much greater impact on seals than absorption of the petroleum. In controlled experiments, seals that were exposed to floating oil developed reversible eye damage (in the wild, “reversible” eye damage could significantly affect an animal’s ability to function). The Project area is in a foraging area for pinnipeds (e.g., California sea lions). Oil-spill trajectory analyses indicate that oil released from a spill in the Project area will almost certainly come ashore, exposing adults and subadults to potentially long-term lethal and sublethal effects.

Sea otters, a threatened species, have steadily increased in numbers in the area from Purisima Point to Point Conception and have extended their range eastward. A breeding colony now also resides in the Purisima Point region. An oil spill, should one occur, has the potential to impact a high number of sea otters. After sea otters’ exposure to oil, death usually results from either an increase in metabolic rate, hypothermia, or inhalation of volatile vapors (Geraci and Williams 1990).

In summary, the marine mammal species that occur in the Project area exhibit varying degrees of vulnerability to oil spills. Impacts can be caused either by oil contact or by ingestion. There is evidence that cetacean species may avoid contact with oil at sea; however, pinniped species and sea otters could potentially suffer lethal and long-term sublethal effects resulting in significant impacts. Onshore cleanup activities, depending on location, could disrupt pinniped haul-out and rookery areas and could also result in significant impacts, particularly if a spill should reach the Channel Islands. As a result, impacts to marine mammals are considered to be significant.

Oil spills can adversely affect marine turtles by toxic external contact, toxic ingestion or blockage of the digestive tract, disruption of salt gland function, asphyxiation, and displacement from preferred habitats (Vargo et al. 1986, Lutz and Lutcavage 1989). Turtles may become entrapped by tar and oil slicks and rendered immobile (Witham 1978, Plotkin and Amos 1988). Small juvenile turtles are particularly vulnerable to contacting or ingesting oil because the currents that concentrate oil spills also form the debris mats in which they are found (Carr 1980, Collard and Ogren 1990). Contact with oil may not cause direct or immediate death, but cumulative sublethal effects, such as salt gland disruption or liver impairment, could impair a marine turtle’s ability to function effectively in the marine environment (Vargo et al. 1986, Lutz and Lutcavage 1989).

Although marine turtles are not commonly encountered in the area of the proposed Project, oil spill impacts to marine turtles are considered to be adverse and potentially significant (Class II) because of their threatened and endangered status.

Areas of Special Biological Significance (ASBS) are areas that have been recognized as biologically important and given a level of protection indicating that damage causing or contributinging to a measurable change in function in these areas represents a significant impact. Impacts that result in the oiling of the nearshore and shoreline habitat in these areas have the potential to change the functionality of these areas. In addition, other sensitive areas are known to occur throughout the SCB. Many, but not all, are included with the ASBS program or may be protected by State or local regulations. These areas may include specialized communities or habitat that supports the presence of marine mammals, birds, or endangered species. Impacts to ASBS and other sensitive habitats from spills at the Marine Terminal are likely to be significant.

Nine ASBS, one within northern Santa Monica Bay, and eight located along nearshore habitats of San Miguel, Santa Rosa, Santa Cruz, Anacapa, Santa Barbara and San Nicolas Islands have a potential of incurring significant impacts from an oil spill at or in transit to/from the Marine Terminal. This impact within the ASBS would be significant. Similar impacts were determined for the worst case diesel spill scenario for the islands, as well as impacts to areas in the southern Santa Monica Bay where kelp beds occur. For the worst case diesel spill scenario for the water column, the islands are not impacted; however, much of the coastline of southern Santa Monica Bay is estimated to be covered with oil that exceeds 100 g/m^2, the model shows impacts to the shoreline. These impacts would be potentially significant. Worst case spill impacts to the marine environment from both light crude and heavy crude spills show that impacts to the ASBS in these scenarios would be significant.

Mitigation measures contained in the site Marine Terminal Operations Manual (MTO), the Spill Prevention, Control and Countermeasure (SPCC) Plan, and the Oil Spill Contingency Response Plan (OSCRP) (Chevron 2003) and the Area Contingency Plan (ACP) reduce the potential significant impacts on biological resources from a Marine Terminal operations oil spill by applying five levels of mitigation: (1) prevention; (2) containment; (3) avoidance of sensitive resources; (4) cleanup and rehabilitation of oiled areas; and (5) restoration and/or compensation for damaged resources and habitat. **MM BIO-1a (Update Oil Spill Contingency Plan to Reflect Project Changes)** addresses how the Applicant will be prepared to respond to all potential oil spills and spill scenarios that could be generated by the proposed Project, thereby minimizing potential adverse impacts. Timely detection and response to oil spills greatly affect the extent and severity of the environmental impacts of oil spills.

Similarly, **MM SSR-2** provides improved oil spill detection, response, and containment measures. With implementation of that measure, the risk to the marine biological resources may be further reduced.

MM BIO-1b (Vessels that Call on Marine Terminal Shall Implement Their Own Oil Spill Response Plan) addresses the need for operators of the individual vessels using the Marine Terminal to incorporate oil spill response measures to help reduce the extent and severity of the environmental impacts in the event of an oil spill during transit to and from the Marine Terminal.

Although complete containment and cleanup of a large oil spill at sea is nearly impossible, mitigation of biological impacts from such a spill is largely a function of the efficacy of the spill-response measures and ambient conditions. The effectiveness of containment and spill cleanup measures is dependent on the response time, availability and type of equipment, type of oil spilled, volume of the spill, and the weather and sea state (e.g., swells, wind waves, chop) during the spill. Only some of these aspects are within the control of the spill-response team.

In addition, many oil spill response and cleanup measures, such as the use of dispersants or the pressure washing of shorelines, have impacts of their own. For example, pressure washing of intertidal areas following the Exxon Valdez spill resulted in alterations to the grainsize distribution within these sediments, which influenced the recovery of the intertidal benthic community. Similarly, the use of dispersants, although they may help to break up a spill, may result in their own toxicity impacts to biota.

With respect to wind-wave conditions, the containment effectiveness of booms begins to decrease at a significant wave height of two feet (0.6 m). Above two feet (0.6 m), booms and skimmers are rendered ineffective; however, it is likely that in that sea state, a slick would be dispersed and mixed into the water column. For long-period swell conditions, booms and skimmers can retain effectiveness in wave heights greater than two feet (0.6 m). High winds can cause some type of booms to lie over, allowing oil to splash and flow over the boom. High winds can also affect the deployment or shape of the deployment and, thus, the containment effectiveness of the boom.

Because there are limitations to thorough containment and cleanup of an offshore oil spill, significant impacts (Class I) remain for benthic organisms, intertidal communities, marine mammals, marine turtles, and marine and shore birds.

Summary. This impact remains potentially significant following application of all feasible mitigation.

CEQA FINDING No. BIO-2

EIR Section 4.3, BIOLOGICAL RESOURCES		Class
Impact No.:	BIO-2: Oil Spill Impacts to Commercial and Recreational Fishing	**I**
Finding(s):	(1) Changes or alterations have been required in, or incorporated into, the Project that avoid or substantially lessen the significant environmental effect as identified in the Final EIR. (3) Specific economic, legal, social, technological or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the Final EIR.	

FACTS SUPPORTING THE FINDING(S)

Accidental discharge of petroleum hydrocarbons into marine waters would adversely affect commercial and recreational fishing.

A wide variety of fish and shellfish species are commercially harvested in the Project area. As described in Impact BIO-1, biota residing in the intertidal and shallow subtidal habitat are particularly vulnerable to oil spills. For example, mass mortalities of invertebrates, such as sea urchins, abalone, and lobsters, were reported following the *Tampico* spill in Baja California (North et al. 1964).

The degree of oiling and the oil spill impacts depend on several factors, such as the location of the spill, volume and type of oil, amount of weathering, evaporation, dispersion of oil into the water column or shoreline, and amount of oil that is contained and cleaned immediately after a spill. Although large spills (e.g., greater than 2,000 bbl [318 m^3]) are rare, the Santa Barbara oil spill of 1969 was estimated at 80,900 bbl (12,862 m^3) (MMS 2001). The spill from the rupture of the Torch Pedernales pipeline was estimated at 163 to 1,242+ bbl (26 to 197+ m^3) (Santa Barbara County 2001b). While the probability for oil contacting and fouling the shoreline or shallow subtidal areas where commercial or recreational species are harvested is low, it can occur nevertheless. Additionally, although contaminated shorelines may be cleaned, in some instances, depending on substrate type, oil may persist in sediments for several years.

Oil spill impacts to commercial and recreational fisheries in the intertidal environment or shallow subtidal areas may be long lasting and can result in loss of areas for most, if not all, of a harvesting season. Hence, impacts to commercial or recreational fishing in intertidal or shallow subtidal areas from a major spill are considered to be significant.

Adult fish, due to their mobility, may be able to avoid or minimize exposure to spilled oil. However, there is no conclusive evidence that fish will avoid spilled oil (NRC 1985). Egg and larval stages would also not be able to avoid exposure to spilled oil. Because losses to commercial and recreational fish resources and losses due to closure of fishing areas for most or all of a fishing season can occur, impacts to commercial and recreational fishing from oil spills are considered to be significant. Fish harvested from contaminated areas may also be reduced in value, and fishing gear can be damaged due to oil fouling, causing additional significant impacts.

In addition to **MMs BIO-1a and BIO-1b**, implementing **MMs SSR-2a through SSR-2k** would reduce the likelihood and consequences of a potential oil spill on fisheries. These latter measures would provide improved oil spill prevention, detection and response capabilities. With implementation of these measures, the risk to the marine environment and impacts to commercial and recreational fishing may be reduced, but not eliminated.

Summary. This impact remains potentially significant following application of all feasible mitigation.

CEQA FINDING No. BIO-3

EIR Section 4.3, BIOLOGICAL RESOURCES		Class
Impact No.:	**BIO-3: Vessel Traffic and Marine Construction Impacts to Biological Resources**	**II**
Finding(s):	(1) Changes or alterations have been required in, or incorporated into, the Project that avoid or substantially lessen the significant environmental effect as identified in the Final EIR.	

FACTS SUPPORTING THE FINDING(S)

Noise from vessel traffic can mask reception capabilities and startle or injure marine species, while entanglement or collisions with vessels can injure or kill protected species.

Over the proposed Project lifetime, vessel calls to the Marine Terminal could potentially increase above current operating conditions. Although this increase would occur gradually over the length of the 30-year lease, the potential increase over baseline conditions would result in approximately 487 vessel calls per year to the Marine Terminal by the end of the lease period. Traffic increases would heighten the probability of vessel collisions with marine animals and result in an overall increase in background marine noise levels. If impacts to marine mammals or turtles occur from increases in vessel traffic, they would be significant because several marine mammal species and all four of the marine turtles known to inhabit the region are protected under the Endangered Species Act, while all marine mammal species are granted additional protection under the Marine Mammal Protection Act of 1972 (Class I). Repair and replacement of pipelines to the Marine Terminal could also impact foraging whales.

Noise produced by vessel traffic, such as tankers traveling to and from the Marine Terminal, represents one of the most pervasive forms of human-made noise in the ocean (McCauley 1994, Richardson et al. 1995) and, in areas of high shipping density, produces a nondescript low frequency noise (< 500 Hz). Vessel sound levels and frequency characteristics are roughly related to ship size and speed, wherein the dominant sound source is propeller cavitation.

In general, pinnipeds and odontocetes tend to be tolerant of vessels. The level of avoidance of baleen whales to vessels appears to be related to the speed and direction of approaching vessels (Richardson et al. 1995). Whales seem most responsive when the sound level is increasing or when a noise source first starts up, such as during a brief playback experiment or when migrating whales are swimming toward a noise source. The limited available data suggest that stationary industrial activities producing continuous noise result in less dramatic reactions by cetaceans than do moving sound sources, particularly ships. Some cetaceans may partially habituate to continuous noise.

Gray whales have been observed to change course at a distance of 650 to 1,000 feet (200 to 300 m) in order to move around a vessel in their paths. On the other hand, some gray whales have not been observed to react until a ship is within 50 to 100 feet (15 to 30 m). Humpback whales have been observed to avoid vessels and change behavior when a boat approached within a half mile.

Dolphin and whale species exposed to close physical approaches as well as noise from different vessels may alter motor behaviors (Janik and Thompson 1996, Nowacek et al. 2001, Williams et al. 2002, Hastie et al. 2003) as well as vocalization characteristics (Lesage et al. 1999, Au and Green 2000, Van Parijs and Corkeron 2001, Buckstaff 2004, Foote et al. 2004). These changes in behavior have both direct energetic costs and potential effects on foraging, navigation, and reproductive activities. Vessel traffic noise may elicit a startle reaction from marine turtles and produce temporary sublethal stress (NRC 1990).

Fishes could be also be impacted by routine activities such as ship traffic noise. It is believed that the sounds produced by large vessels could frighten fish schools or cause them to change their migration routes. Studies suggest that the noises produced by fishing and by underwater construction cause avoidance behaviors in fish (EPA 1980). However, the temporary nature of this activity at the Marine Terminal is not expected to significantly impact fishes.

Due to the proximity of various species migration routes to the nearshore marine traffic lanes, collisions between vessels and whales occur frequently off the California coast. The proposed increases in vessel traffic associated with the proposed Project would heighten the probability for collisions between vessels and protected marine species (e.g., marine mammals and turtles). Vessel speed has been implicated as a key factor in the frequency and severity of vessel strikes to large whales (Silber et al. 2009). As a result, vessel speed restrictions and advisories have become widely employed as means to reduce the likelihood and severity of whale ship strikes in U.S. waters.

During the fall of 2007 five confirmed blue whale fatalities occurred within the SCB within a two month period. At least two of these fatalities were attributed to ship strikes: a 15-foot (4.6-m) long bruise was found on the side of a juvenile whale that washed up in Ventura County in September 2007 after initially being sighted from a plane near San Miguel Island; and a second whale thought to have been hit by a freighter was found floating in Long Beach Harbor a week earlier (LA Times 2007). NOAA designated this spate of fatalities as an “unusual mortality event.” Four additional fatalities have occurred to fin and blue whales in the region as a result of ship strikes since then. The most recent event, in April 2009, involved a 60-foot (18.3-m) fin whale that was struck and impaled upon the bow of a container ship en route from Santa Barbara to San Pedro. Since collisions between vessels and federally protected marine mammal species, can result in severe injury or death, collisions are considered to be a significant, but mitigable impact.

In addition to the larger cetacean species, Santa Monica Bay and the nearby waters are also inhabited year-round by three relatively abundant dolphin species (bottlenose dolphins, short-beaked common dolphins, and long-beaked common dolphins) and two species of pinniped (California sea lions and harbor seals) (Bearzi et al. 2008). Although no collision injuries from large vessels have been reported to these smaller, fast-swimming marine mammal species, in many cases it would be unlikely that such collisions would be substantial enough to be noticed by large vessels in transit when they do occur.

Very little information describing pinniped responses to vessels is available. Johnson et al. (1989) reported that northern fur seals can be wary and show an avoidance reaction to vessels at distances of up to one mile (1.6 km), while Wickens (1994) reported that fur seals are often attracted to fishing vessels to feed. Sea lions in the water often tolerate close and frequent approaches by vessels, especially around fishing vessels.

Sea lions hauled-out on land are more responsive and react when vessels approach within 328 to 656 feet (100 to 200 m) (Peterson and Bartholomew 1967). Also, harbor seals often move into the water in response to vessels. Even small boats that approach within 328 feet (100 m) displace harbor seals from haul-out areas, and less severe disturbance can cause alert reactions without departure (Bowles and Stewart 1980, Allen et al. 1984, Osborn 1985).

Riedman (1983) reported that, while sea otters often allow close approaches by small boats, they tend to avoid high activity areas. He also noted that some rafting sea otters exhibit mild interest in vessels at distances of approximately 600 feet (183 m) and are not alarmed. Garshelis and Garshelis (1984) reported that sea otters in Alaska tend to avoid areas with frequent vessel traffic. Udevitz et al. (1995) reported that sea otters tend to move away from an approaching vessel.

Bartol & Musick (2003) suggest that sound and light are the primary cues used by marine turtles to detect an approaching vessel. As stated previously, noises from vessel traffic may elicit a startle reaction from marine turtles and produce a temporary sublethal stress (NRC 1990). Further, the cumulative risk of collision for an individual turtle in a foraging area that receives vessel traffic is high, since the risk of collision persists over decades.

Although marine turtles are uncommon in the immediate Project area, with the projected increase in vessel traffic over the lifetime of the Project the possibility that protected marine turtles could be harmed or killed by collisions with Project-related vessels remains, particularly during El Niño events when marine turtles (primarily loggerheads and green turtles) evince a heightened presence within the SCB.

Replacement of the pipelines to the two Marine Terminal berths could occur over the lifetime of the proposed Project. Although entanglements by whales have not been reported offshore California, the potential for marine mammals, especially whales, to become entangled in these subsea lines, both during and after installation, is a cause for concern.

Gray whale feeding behavior provides for the potential to come into contact with a bottom cable. Hence, during feeding on benthic infauna, entanglements with cable are possible, should cables or pipelines be exposed or buried to insufficient depths. However, entanglement impacts to other marine mammals, such as pinnipeds and fissipeds, are not expected to occur.

Although entanglement with a single cable is unlikely, an unburied cable, or one that is suspended high off the seafloor would increase the likelihood of a collision and possible entanglement. A collision with a suspended or unburied cable is also possible during active feeding frenzies or other instances requiring quick maneuvers.

In order to avoid causing disturbance, injury or death to protected marine species (e.g., endangered and threatened species and marine mammals), **MM BIO-3a (Marine**

Mammal and Turtle Contingency Plan) requires the Applicant to ensure that a contingency plan is developed and implemented for all vessel operations using the Marine Terminal (including tankers, line boats, and launches) that focuses on recognition and avoidance procedures when marine mammals and turtles are encountered within 12 nautical miles (nm) of the California shoreline. The plan shall be submitted within one year of lease approval and reports shall be submitted to CSLC staff annually thereafter. Minimum components of the plan include:

Avoidance of marine mammals and turtles can be facilitated through training and education of vessel operators to recognize, understand, and minimize conflict with marine species. Implementation of the marine mammal/turtle observer requirement and the proposed speed limitation would substantially reduce the potential for adverse impacts to marine mammals and turtles.

Implementation of **MM BIO-3a** would substantially reduce the potential for adverse impacts to marine mammals and turtles below baseline conditions.

Summary. With the mitigation described above, the impact is reduced to a less than significant level.

CEQA FINDING No. BIO-4

EIR Section 4.3, BIOLOGICAL RESOURCES		Class
Impact No.:	**BIO-4: Vessel Traffic and Marine Construction Impacts to Commercial Recreational Fishing**	**II**
Finding(s):	(1) Changes or alterations have been required in, or incorporated into, the Project that avoid or substantially lessen the significant environmental effect as identified in the Final EIR. (2) Such changes or alterations are within the responsibility and jurisdiction of the U.S. Coast Guard and not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by such other agency.	

FACTS SUPPORTING THE FINDING(S)

Vessel traffic to and from the Marine Terminal could cause loss or damage to commercial fishing gear in the Project area. Fishing preclusion zones during offshore construction activities could limit fishing activities.

With the potential increase in the number of vessel calls to the Marine Terminal, the likelihood of impacts to commercial fishing gear could increase over baseline conditions. Vessel traffic crosses nearshore fishing areas en route to the Marine Terminal. As tankers and barges traverse the shipping channel, fisherman cannot access the area and, thus, temporarily lose a small portion (one square mile [2.6 km^2]) of their fishing area. Additionally, if vessels hit or become entangled in fishing gear, damage to the gear could occur.

Recreational fisheries in the vicinity of the Marine Terminal occur at, but are not limited to, the Channel Islands from San Miguel to San Clemente, piers from Los Angeles/Long Beach Harbor to Santa Barbara, nearshore kelp beds, and sheltered beaches that are popular for surf fishing. Ocean outfalls also are popular recreational fishery locations because some sport fishes are attracted to the warm, nutrient-laden effluent.

Vessel collisions or entanglements where fishing gear could be damaged or lost could also occur during repair and construction activities. Within the Marine Terminal exclusion zone, maintenance of the pipelines may occur over a few weeks during the lease term, while replacement of the pipelines to the two Marine Terminal berths could happen during the Project lifetime.

To reduce vessel traffic conflicts en route between marine terminals and at the terminals themselves, various protocols have been developed. First, under the Ports and Waterways Safety Act (PWSA) (33 U.S.C. 1223(c)), the Commandant of the USCG may designate necessary fairways and traffic separation schemes (TSS) to provide safe access routes for vessels proceeding to and from U.S. ports. The PWSA provides for the paramount right of navigation over all other uses that within designated fairways and TSS, and allows the USCG to adjust the location or limits of designated fairways or TSS. TSS have been established within the Santa Barbara and San Pedro Channels.

Vessel traffic approaching and departing the Marine Terminal is highly monitored. VTIS services use radar, radio, and visual inputs to gather real time vessel traffic information and broadcast traffic advisories and summaries to assist mariners.

Additionally, USCG rules (46 CFR 15) mandate pilots with Federal licenses on all vessels that call at offshore marine oil terminals in California. The effect of this rule is that tankers arriving early at the Marine Terminal anchor several miles offshore in Federal waters and wait for the opening of a berth since they must have licensed pilots when they are within three miles of the shore in Santa Monica Bay.

Beginning in 2006, Chevron also began the practice of requiring a tug boat to be present when any vessel is approaching, mooring at, or departing the Marine Terminal.

The purpose of the tug is to assist vessels while they are in the vicinity of the terminal and to increase responsiveness in case of an accident.

Because vessels visiting the Marine Terminal will use designated vessel traffic corridors where applicable, and the fact that the PSWA provides a legal standard for determining right of way in the event of a collision, this impact is considered potentially significant, but mitigable.

Similarly, any restrictions on fishing due to construction activities, such as for replacement of the pipelines to the berths, are likely to be localized and temporary. Pipeline replacements are expected to take approximately one to two months. However, the replacement of the pipelines to the berths does not currently indicate whether these lines will be buried or lie above the seafloor substrate. Unburied cable or pipelines have the potential to snag fishing gear in the Project area.

MM BIO-4 (Use Designated Marine Traffic Corridors) requires support and tankering vessels to use designated traffic corridors where possible during the 30-year lease term. This mitigation measure would minimize potential disputes over vessel right of way. With implementation of this measure, the risk to the marine environment and impacts to commercial and recreational fishing would be potentially significant.

Summary. With the mitigation described above, the impact is reduced to a less than significant level.

CEQA FINDING No. BIO-5

EIR Section 4.3, BIOLOGICAL RESOURCES		<u>Class</u>
Impact No.:	**BIO-5: Oil Spill Impacts to Onshore Biological Resources**	**I**
Finding(s):	(1) Changes or alterations have been required in, or incorporated into, the Project that avoid or substantially lessen the significant environmental effect as identified in the Final EIR. (2) Such changes or alterations are within the responsibility and jurisdiction of the U.S. Coast Guard and not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by such other agency. (3) Specific economic, legal, social, technological or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the Final EIR.	

FACTS SUPPORTING THE FINDING(S)

Accidental discharge of petroleum hydrocarbons into the environment could adversely affect onshore biological resources. Under the various scenarios evaluated, shorelines extending from Santa Barbara south to Long Beach, including portions of the Channel Islands, could potentially be impacted by spilled oil. The effects of spilled oil on onshore biological resources would depend on such factors as the physical and chemical properties of the oil, specific environmental conditions at the time of the spill, and the species present.

The loss or injury of Federal or State listed wildlife species and the loss or degradation of upland, wetland, aquatic habitats, or sensitive biological habitat, including stream and river mouth; salt, freshwater, or brackish marsh; coastal lagoons and estuaries; breeding habitat designated as critical for the western snowy plover; or the injury to plants and terrestrial and aquatic wildlife through direct toxicity, smothering, and entrapment, as well as through resultant cleanup efforts, would result in a potentially significant adverse impact that remains significant even after mitigation.

For any of the sensitive wildlife species, the level of impact would depend on the size and location of the spill, the amount of habitat affected, and the number of individuals and species affected, environmental conditions at the time, containment and cleanup measures taken, and length of time for habitat and species recovery.

Certain types of biological communities would be more severely affected by an oil spill than others. For example, oil spill impacts would be particularly significant if spills were to enter estuaries or wetland habitats (e.g., Ballona Wetlands and Malibu Creek), or occur along shorelines where critical habitat for sensitive species was designated. Vegetated marshes and coastal estuaries are two of the habitats occurring in the Project area that would be particularly sensitive to an oil spill because much of the biological activity is concentrated near the soil or water surface where oil would be stranded.

Salt marshes and coastal estuaries within the Santa Monica Bay area, as well as the species that use them, would suffer significant impacts if contacted by oil from a spill associated with the Marine Terminal. Although an oil spill may consist of a single occurrence, coastal marshes and estuaries can be subjected to repetitive applications of oil due to tidal oscillations and marsh/estuarine circulation. Marsh substrates can retain and concentrate oil through such repetitive contact. This may be intensified by marsh sediment porosity and interstitial absorption. The slow, chronic discharge of buried oil which contains toxic conformations and reaction products that are leached into the surface substrate causes continuous stress on plant regeneration and prevents ecosystem regeneration.

An oil spill would impact vegetation both directly and indirectly. Direct effects include smothering of plants that would reduce the availability of water, nutrients, and oxygen to the plant root system; this would potentially result in reduced growth or death of individual plants. Vegetation recovery would potentially be slow in areas of oiled soils because of lingering toxicity or altered soil characteristics.

Impacts on resident biota could be short- to long-term, depending on the amount of oil spilled, environmental conditions at the time, containment and cleanup measures taken, and length of time for habitat recovery. Direct impacts on wildlife from oil spills include physical contact with oil, ingestion of oil, and loss of food, critical nesting and foraging habitats. Organisms can be affected physically through smothering, interference with movement, coating of external surfaces with black coloration (leading to increased solar heat gain), and fouling of insulating body coverings (birds and mammals). Toxicity can occur via absorption through the body surface (skin, gills, etc.) or ingestion. Biological oxidation (through metabolism) can produce products more toxic than the original compounds. Sub-lethal effects include reduced reproductive success, narcosis, interference with movement, and disruption of chemosensory functions.

Spills or disturbances resulting from cleanup efforts within the sandy beach and foredune habitats have the potential to substantially affect a wide variety of wildlife. Aquatic invertebrates and reptiles, amphibians and birds would be the most vulnerable to oil spills. In particular, Santa Monica Bay is a critical feeding area along the Pacific flyway used by up to one million shorebirds, including sandpipers, plovers, killdeer, oystercatchers, stilts, avocets and willets (Baird 1993). Shorebirds are generally most abundant in winter with 21 species seasonally occurring in the SCB. Most shorebirds feed in shallow waters and flats of bays and estuaries, while some prefer to feed along sandy beaches and rocky shores. Although shorebirds are able to avoid oiling to some extent by retreating from exposed habitat, both bay and open coast feeding habitats will potentially be impacted by an oil spill at the Marine Terminal.

Sensitive species, such as the globose dune beetle, sandy beach tiger beetle, western snowy plover, and least tern would also likely be affected if a spill or cleanup activities were to contact the shoreline near the Marine Terminal. The federally threatened western snowy plover uses beaches in the vicinity of the Marine Terminal and adjacent beaches to the west as both wintering and nesting sites. Designated critical habitat for the western snowy plover includes portions of the beach directly adjacent to the Marine Terminal. Effects of an oil spill in this area during the breeding season would potentially increase mortality of nesting plovers, chicks and fledglings, depending on the time of the spill. A spill that contacts the shoreline would also contaminate or increase mortality of invertebrates that are forage material for the plover and other shoreline-dependent species, therefore resulting in indirect impacts on individuals and/or breeding success.

The endangered California least tern currently uses the upper beach at Venice Beach for nesting, and may potentially use other nearby beaches, such as Dockweiler in the future. Substantial mortality of wintering shorebirds or loss of essential habitat would likely result from oil spills associated with the proposed Project. Cleanup activities could disturb the tern colony during the nesting season from April to July, as well as displace overwintering snowy plovers. These impacts would be considered potentially significant and unavoidable.

Cleanup impacts could be more substantial than the effects of the spilled oil. Spill response and cleanup actions, including but not limited to application of dispersants, pressure washing of intertidal areas, and manual removal of oil from beaches and estuaries could directly result in toxicity or fouling to biota, overland crushing of individual organisms, vegetation removal, and habitat degradation. Clearing or grading could be required to remove and dispose of oiled vegetation and soils, resulting in additional impacts to vegetation and seedbanks and loss of forage and nesting habitat. Additionally, soil disturbance could facilitate invasion by weeds. Cleanup activities that result in vegetation removal or excavation would require restoration of native habitat after the spill cleanup is complete. The level of impact would depend on the spill size, amount of habitat affected, and number of individuals and species types affected.

Chevron currently maintains an Emergency Action Plan that addresses response actions to be completed in the event of a “significant event.” In addition, Chevron maintains an Oil Spill Contingency Plan (OSCP) to address spills that could potentially occur from the Marine Terminal and existing pipelines.

MM BIO-5 (Update the Oil Spill Contingency Plan to Protect Sensitive Resources) requires the OSCP to be revised and updated to address protection of sensitive biological resources and revegetation of any areas disturbed during an oil spill from the proposed pipeline or cleanup activities. The OSCP shall be submitted within one year of lease approval and reports submitted to CSLC staff annually thereafter.

MM BIO-5 would provide greater specificity to the OSCP by: identifying which species require avoidance; describing how to remove spilled material from particularly sensitive wildlife habitats and affected animals; detailing how to develop and implement habitat restoration plans needed to effectively restore native plant and animal communities to pre-spill conditions; and providing monitoring effectiveness criteria. These measures would help reduce potential oil spill-induced impacts on biological resources including sensitive species and habitats such as the nearby Ballona Wetlands.

An oil spill that would potentially result in impacts on populations of Federal- or State-listed wildlife species, such as the western snowy plover and California least tern, cannot be reduced below the significance criteria. Although **MM BIO-5** proposes to reduce impacts on plant communities and common wildlife species, and could reduce impacts on Federal- and State-listed species and other sensitive wildlife species and their habitats, it cannot entirely eliminate the risk of substantial impacts to these and other biological resources. Revegetating with native species in areas where vegetation is removed or otherwise impacted by a spill or cleanup activities would potentially reduce significant impacts on native vegetation and wildlife habitats to below the significance criteria. However, large spills that result in impacts to designated (or proposed) critical habitat, wetland and aquatic habitats, and biota, including Federal- and State-listed species would remain significant even after mitigation.

Summary. This impact remains potentially significant following application of all feasible mitigation.

CEQA FINDING No. AQ-1

EIR Section 4.4, AIR QUALITY		Class
Impact No.:	**AQ-1: Exceedance of Incremental Health Risk Threshold During Project Operations**	**II**
Finding(s):	(1) Changes or alterations have been required in, or incorporated into, the Project that avoid or substantially lessen the significant environmental effect as identified in the Final EIR. (2) Such changes or alterations are within the responsibility and jurisdiction of the South Coast Air Quality Management District and not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by such other agency.	

FACTS SUPPORTING THE FINDING(S)

Operational diesel particulate matter (DPM) emissions from additional marine tankers could exceed the SCAQMD significance threshold for incremental cancer or chronic risk.

Impact Discussion

Recent studies have shown that for projects involving ocean-going vessels, the toxic air contaminant of primary concern is DPM and the health effects scenario of primary concern is individual lifetime cancer risk (California Air Resources Board [CARB] 2006, POLA 2008b). Because cancer risk estimates are based on long-term exposure periods of up to 70 years for residential receptors, a project's long-term emissions, rather than peak daily emissions, are used to calculate cancer risk. A project's long-term emissions are also used to calculate chronic hazard indices.

By contrast, the acute hazard index is based on peak one-hour emissions. Peak one-hour impacts would be the same as the current operations as the peak hour and peak day would not change for future operations.

Although maximum daily or hourly emissions would not increase at the Marine Terminal, annual emissions may increase, as additional tankers would deliver the additional crude oil and partially refined product and carry away additional product.

The maximum annual average onshore DPM concentration from transit, maneuvering, hoteling and anchorage emissions was estimated using the Industrial Source Complex (ISC) model for an increase in tanker operations. The proposed Project additional tankers per year expected in 2040 yields an onshore maximum cancer risk of 39.6, which would be a significant impact under the SCAQMD threshold criteria (greater than 10 cancer cases per million or a health hazard index of 1.0) as this would be an increase above the baseline cancer risk for an individual receptor of more than 10 in a million. The cancer burden would be an estimated 10.8 under the future operations.

To determine the non-cancer, chronic health impacts associated with the proposed Project DPM emissions, the final year of the lease was analyzed. Modeling results indicate a maximum incremental chronic hazard index for DPM of 0.02, which is below the SCAQMD significance threshold of 1.0 (SCAQMD 2006). Modeling of n-hexane chronic emissions also indicates that the n-hexane HI would be less than .001. This would be a less than significant impact.

MM AQ-1 (Low Sulfur Fuels in Marine Main and Auxiliary Engines and Speed Limits) requires that from the beginning through the end of the new 30-year lease term, all main and auxiliary engines on crude oil marine tankers calling at the Marine Terminal shall use marine diesel oil (MDO) or marine gas oil with a maximum of 0.1 percent sulfur by weight. If MDO or marine gas oil with maximum 0.1 percent sulfur by weight content is not available then tankers shall use MDO or marine gas oil with maximum 0.2% sulfur by weight content. This measure shall apply while the tankers are in waters of the South Coast Air Basin (SCAB) as defined in SCAQMD Rule 1142, including while hoteling or transferring product at the Marine Terminal. In addition, all marine tankers calling at the Marine Terminal shall reduce speed to 12 knots within waters of the SCAB as defined in AQMD Rule 1142.

As stated, **MM AQ-1** would reduce DPM emissions from marine tanker auxiliary engines during transit, hoteling, and product transfer at the Marine Terminal. This measure would apply to all tankers calling at the Marine Terminal, not just the potential additional tankers associated with the proposed Project. San Pedro Bay Ports Clean Air Action Plan measures OGV-3 and OGV-4 specify using lower sulfur fuel; the measures require using lower sulfur distillate fuels in the auxiliary engines of ocean going vessels within 20 nm (37.0 km) of Point Fermin and while at berth (POLA and POLB 2006).

Recent regulations (CARB Ocean-Going Vessel Auxiliary Diesel Engine Regulation, 13 CCR 2299.1 and 17 CCR 93118) required ship auxiliary engines operating in California Regulated Waters (within 24 nm) to use MDO with a maximum of 0.5 percent sulfur by weight or use marine gas oil, effective January 1, 2007. Starting on January 1, 2010, auxiliary engines operating in California waters must meet a second set of emission limits.

Maintaining a speed of 12 knots within the SCAB reduces emissions since the emissions per unit of distance decrease as the vessel goes slower. The speed of 12 knots balances the needs for reduced emissions with the need to move cargo. The 12-knot speed is also recommended in the San Pedro Bay Ports Clean Air Action Plan measure OGV-1, Vessel Speed Reduction.

Engines using fuel with a sulfur content of 0.1 percent would reduce nitrogen oxide (NOx) emissions by 10 percent (over 2.5 percent fuel oil), DPM emissions by 65 percent, and sulfur oxide (SOx) emissions by 96 percent (SBPB 2006). A reduction in DPM emissions of 65 percent would reduce the Maximum Individual Cancer Risk (MICR) to 13.8 cases per million, and would reduce the cancer burden to an estimated 2.9, which would be less than the cancer MICR and burden associated with the current, baseline operations. Maximum individual incremental cancer risk levels at each receptor would actually decrease under the mitigated proposed Project compared to the baseline levels. This would, therefore, be less than significant with mitigation.

Summary. With the mitigation described above, the impact is reduced to a less than significant level.

CEQA FINDING No. AQ-2

EIR Section 4.4, AIR QUALITY		Class
Impact No.:	**AQ-2: Emissions of Greenhouse Gases within the SCAB Could Exceed SCAQMD Thresholds**	**I**
Finding(s):	(1) Changes or alterations have been required in, or incorporated into, the Project that avoid or substantially lessen the significant environmental effect as identified in the Final EIR. (2) Such changes or alterations are within the responsibility and jurisdiction of the South Coast Air Quality Management District and not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by such other agency. (3) Specific economic, legal, social, technological or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the Final EIR.	

FACTS SUPPORTING THE FINDING(S)

Operational greenhouse gas (GHG) emissions from additional marine tanker calls could exceed the SCAQMD threshold of 10,000 metric tons per year equivalent, as defined by the SCAQMD for stationary sources. Although the Marine Terminal is not a stationary source and would, therefore, not be subject to the GHG threshold requirements, the SCAQMD threshold for a stationary source has been applied. The GHG emissions from future Marine Terminal operations within the SCAB would be more than the SCAQMD threshold and would, therefore, be potentially significant.

Approximately 34 percent of the GHG emissions occur from vessels while hoteling, 44 percent occur while vessel is in transit while in the SCAB and the remaining occurs due to tugs and shore-side electrical use for pumps and equipment.

MM AQ-2 (Greenhouse Gas Monitoring and Reduction Strategies) requires the Applicant to implement a program to quantify and report to CSLC staff GHG emissions associated with Marine Terminal operations with the SCAB and within California. If these emissions exceed the GHG emissions estimates associated with the baseline operations, then a GHG emission reduction program shall be implemented to reduce emissions to less than the baseline GHG emissions. The program could include measures such as; using green electrical power to run onshore equipment; requiring tugs to use biodiesel; using shore power systems, using shore-side pumping systems instead of vessel-powered pumps, further reducing vessel speed while in the SCAB, or other measures, including offsite GHG reduction programs in the community.

Both the use of green power and biodiesel in tugs would reduce GHG emissions since renewable energy sources and biodiesel emit fewer, if any, lifecycle GHG emissions. The reduction of vessel speeds produces fewer emissions on a per mile basis due to the power law relationship between vessel speed and fuel use (Psaraftis 2009).

A combination of these measures could reduce the GHG emissions to below the 10,000 tons/year SCAQMD threshold for stationary sources. However, the ability to implement some of these measures is uncertain; therefore, the impacts would still be potentially significant under the proposed Project scenario.

Summary. This impact remains potentially significant following application of all feasible mitigation.

CEQA FINDING No. AES-1

EIR Section 4.5, AESTHETICS		Class
Impact No.:	**AES-1: Oil Spills and Resultant Cleanup Operations Affect Visual Quality**	**I**
Finding(s):	(1) Changes or alterations have been required in, or incorporated into, the Project that avoid or substantially lessen the significant environmental effect as identified in the Final EIR. (3) Specific economic, legal, social, technological or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the Final EIR.	

FACTS SUPPORTING THE FINDING(S)

Oil spills would substantially degrade the character of the site and would result in changes in the expectations of viewers.

In general, the potential impacts resulting from an accidental spill would degrade the visual quality of the water and the shoreline in contact with the spilled materials. The degree of impact is influenced by factors that include, but are not limited to, location, spill size, type of material spilled, prevailing wind and current environmental conditions, vulnerability and sensitivity of the shoreline, and response capability.

Accidents at the Marine Terminal during mooring, loading, and unloading pose the greatest risk of a spill. While vessels are in transit, the risk of a spill decreases; however, the size of a spill while in transit could be significantly greater. The areas most susceptible to oiling are highlighted in the consequence modeling. This oil spill modeling indicates the impacts of several possible oil spill scenarios. In general, any oil spill at the Marine Terminal would result in the migration of material predominantly eastward, as the winds blow predominantly eastward. The area affected would primarily be along the east areas of the Santa Monica Bay directly eastward of the Marine Terminal. However, depending on the wind direction and currents, impacts could potentially extend along the coastline from Long Beach to Santa Barbara.

Spills originating at or near the Marine Terminal and in shipping channels in the Santa Monica Bay have the potential to impact viewpoints of the El Segundo area and the shoreline from Dockweiler State Beach Park to Malibu, including Marina Del Rey, Venice Beach, Santa Monica, and other Los Angeles city and County beaches, to the north; Manhattan Beach, Hermosa Beach, Redondo Beach, the Palos Verdes Peninsula area, and Los Angeles Harbor to the south; and the Channel Islands to the west. The visual impact of oil spills depends on several factors including the duration and extent of shoreline and water surface oiling as well as current local conditions.

Larger oil spills (275,000 bbl and larger) could cause widespread shoreline and surface water oiling. Visually, oiling conditions could range from light oiling (appears as a surface sheen) to heavy oiling (includes lumps of floating tar). For equally sized spills under similar wind conditions, spills of heavier crudes would remain on the surface longer and have greater visual impacts than spills of lighter crudes or diesel products.

Oil on the water would change the color and, in heavier oiling, textural appearance of the water surface. The potential presence of oil on shoreline surfaces could cover surfaces with a brownish to black layer of slick or gooey material. The impact could last for extended periods of time, from hours to weeks, depending on the level of physical impact and cleanup ability. The briefest significant adverse impacts would generally be anticipated where light oiling dispersed rapidly, such as a diesel spill. In the event of medium to heavy oiling over a wide-spread area, cleanup efforts and residual effects of oiling may be observed for more than three months for onshore clean-up, and significant adverse impacts would result. The labor and equipment, including barges and other vessels, involved in the cleanup itself would also contribute to visual impacts.

During oil spill accidents, viewer sensitivity to an area tends to increase. As the public becomes aware of an oil spill, sensitivity levels increase. Unless a spill is contained immediately by booming and cleanup, the visual effects of even a relatively small spill of 500 bbl would be significant. Such an oil spill would cause a significant impact, which would remain significant after implementation of the identified mitigation measures.

Mitigation Measures for oil spill impacts include **MMs SSR-1a, SSR-1b, SSR-2a through SSR-2k, BIO-1a, and BIO-1b**, as they relate to preventing and minimizing a spill and spill-related aesthetic impacts. These measures would minimize oil spills and maximize cleanup efforts, reducing the impact to the visual environment. While oil spills would eventually be remediated, during the short-term duration of cleanup activities, impacts would remain significant after mitigation measures have been implemented.

Summary. This impact remains potentially significant following application of all feasible mitigation.

CEQA FINDING No. GEO-1

EIR Section 4.6, GEOLOGICAL RESOURCES		Class
Impact No.:	**GEO-1: Rupture of Facilities from Earthquake Motion**	**I**
Finding(s):	(1) Changes or alterations have been required in, or incorporated into, the Project that avoid or substantially lessen the significant environmental effect as identified in the Final EIR. (3) Specific economic, legal, social, technological or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the Final EIR.	

FACTS SUPPORTING THE FINDING(S)

Oil spills from pipeline and other facility ruptures could occur as a result of earthquake motion. Earthquake-related hazards, such as seismicity and faulting, cannot be avoided in the southern California region. Based on the 2007 Working Group on California Earthquake Probabilities data, there is 99.7 percent probability that southern California will experience a Magnitude 6.7 or greater earthquake during the next 30 years. An earthquake of this magnitude on one of the known faults previously discussed may cause extensive damage to the Marine Terminal. A moderate to great earthquake along one of the faults in the Project vicinity would result in strong to intense ground motions at the site, including high ground accelerations beyond design specifications for facilities. Ruptures of pipelines and other components of the facility could occur and result in spilled petroleum products. Further, the underwater pipelines are unburied on the sea floor in water depths of greater than 12 feet (3.6 m) in compliance with U.S. Bureau of Ocean Energy Management, Regulation, and Enforcement (BOEMRE) West Coast guidelines and requirements for areas subject to seismic activity.

Seismic hazards associated with major or great earthquakes in southern California are an unavoidable aspect of living in the region. A moderate to great earthquake along one of the faults in the Project vicinity would result in strong to intense ground motions at the site, including high ground accelerations beyond facility design specifications. Ruptures of pipelines and other facilities could occur resulting in spilled crude oil or petroleum products. The frequency of these events would increase under the proposed Project with increases in the amounts of material loaded/unloaded and the time needed to load/unload the materials at the Marine Terminal. These impacts would be potentially significant and would remain significant after implementation of mitigation measures.

MM GEO-1a (Implement Site-Specific Geotechnical and Seismic Evaluation Results) requires the Applicant to complete a site-specific geotechnical and seismic-hazard evaluation for any new facilities or pipeline routes including faulting, ground shaking, liquefaction hazards, landslides and slope stability issues. The Applicant shall submit certified copies of these reports to CSLC staff for review and approval 60 days prior to the start of any construction and maintain an ongoing process during construction (as applicable). The Applicant shall implement all recommendations from the Geotechnical and Seismic studies as directed by the CSLC staff. In addition, any new engineered structures, including pipeline alignment and profile drawings, buildings, other structures, other appurtenances and associated facilities, shall be designed, signed, and stamped by California registered professionals certified to perform such activities in their jurisdiction such as Civil, Structural, Geotechnical, Electrical and Mechanical Engineering.

MM GEO-1b (Seismic Resistant Design) requires the Applicant to perform seismic evaluation and design for all facilities or pipelines and employ current industry seismic design guidelines including but not limited to: Guidelines for the Design of Buried Steel Pipe by American Lifeline Alliance (2001), Guidelines for the Seismic Design and Assessment of Natural Gas and Liquid Hydrocarbon Pipelines by Pipeline Research Council International (2004), and the CSLC MOTEMS for seismic resistant design of the pipeline. The seismic evaluation of existing facilities shall be conducted in accordance with the Local Emergency Planning Committee Region 1 Guidance for California Accidental Release Prevention Seismic Assessments including a walkthrough by a qualified seismic engineer. Post-event inspections must also follow MOTEMS guidelines. This evaluation and design shall be conducted within one year of lease approval and reports submitted to CSLC staff annually thereafter.

MM GEO-1c (Seismic Inspection) states that during the 30-year lease term, the operator shall cease associated pipeline operations and inspect all project-related pipelines and equipment following any seismic event in the region (Los Angeles County and offshore waters of the Santa Monica Bay and southern Channel Islands) that produces a ground acceleration of 5 percent of gravity (0.05 g) at the Marine Terminal site. The operator shall report the findings of such inspection to CSLC staff, the city of El Segundo, and the County of Los Angeles. The operator shall not reinstate operations of the Marine Terminal and associated pipelines within the city of El Segundo until authorized by CSLC staff.

Incorporating site-specific earthquake-resistant design into newly engineered facilities and performing inspections after all great seismic activity can help to reduce impacts from future seismic activity. Ground acceleration is the primary determinant factor in assessing equipment damage. Measurements of ground acceleration can be achieved by installing an accelerometer or using a nearby accelerometer (associated with TriNET as installed by the U.S. Geological Survey located at LAX) or other agency or institution.

It is economically infeasible to construct facilities that are completely resistant to damage from the possible high ground accelerations associated with a major or great earthquake in southern California. Therefore, potential adverse impacts are unavoidable and would remain significant.

Summary. This impact remains potentially significant following application of all feasible mitigation.

CEQA FINDING No. GEO-2

EIR Section 4.6, GEOLOGICAL RESOURCES		Class
Impact No.:	**GEO-2: Oil Spills from Tsunami Wave Damage**	**I**
Finding(s):	(1) Changes or alterations have been required in, or incorporated into, the Project that avoid or substantially lessen the significant environmental effect as identified in the Final EIR. (3) Specific economic, legal, social, technological or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the Final EIR.	

FACTS SUPPORTING THE FINDING(S)

A major to great earthquake within the Pacific Rim or a large-scale submarine landslide in the Project vicinity could result in a tsunami. Based on the elevation of onshore facilities and the estimated run-up from tsunamis, it is anticipated that tsunamis of distant origin would not result in an adverse impact. However, a tsunami of local origin could inundate onshore facilities, causing flooding and potential damage to these facilities. This would result in an adverse impact. Since the probability of a local earthquake generating a tsunami exceeding surface elevations at the site is considered low, this potential adverse impact to onsite facilities is not considered significant.

Offshore facilities would be exposed to tsunamis of both local and distant origin. The offshore facilities are expected to withstand a significant wave height of 15 feet (4.6 m) and a maximum individual wave height of 23 feet (7.0 m) (current predicted tsunami wave heights). However, if the berths, pipelines, or vessels are damaged while unloading, petroleum products could spill. The frequency of these events would increase under the proposed project as the amount of material loaded and unloaded, and, therefore, the time to load and unload the materials at the Marine Terminal, could increase under the proposed Project. This would be a significant impact and would remain significant after the implementation of **MM GEO-2**.

MM GEO-2 (Tsunami Alert) requires the development of tsunami response training and procedures to assure that construction and operations personnel will be prepared to act during a large seismic event. As part of the Project's overall emergency response planning, the procedures shall include immediate evacuation requirements if a large seismic event is felt that could affect the proposed Project site such that all precautions can be made in the event of a local tsunami. This shall include the departure of all vessels in berth or in the area. These procedures shall be submitted within one year of lease approval and reports submitted to CSLC staff annually thereafter.

Establishment of standard procedures and training for a large seismic event would provide a quick response time for all vessels in berth to depart and mobile equipment to be secured in the event of a tsunami. Immobile equipment onshore would not be able to be secured in the event of a tsunami. Therefore, the impact would remain significant.

Summary. This impact remains potentially significant following application of all feasible mitigation.

CEQA FINDING No. GEO-3

EIR Section 4.6, GEOLOGICAL RESOURCES		Class
Impact No.:	**GEO-3: Oil Spills as a Result of Liquefaction**	**I**
Finding(s):	(1) Changes or alterations have been required in, or incorporated into, the Project that avoid or substantially lessen the significant environmental effect as identified in the Final EIR. (3) Specific economic, legal, social, technological or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the Final EIR.	

FACTS SUPPORTING THE FINDING(S)

An extended duration of ground shaking associated with a moderate to major earthquake in the area could induce liquefaction at the site. Liquefaction at the site could result in settling of the ground surface and associated facilities, causing damage to pipelines and other facilities at the site. However, both offshore and onshore petroleum pipelines are designed to allow for some movement, settlement, and spanning without causing damage to the pipeline. A steel pipeline is a continuous welded structure with substantial tensile strength, generally in excess of that required to contain internal pressure. Depending upon the length and location affected, the pipeline can withstand loss of some support (caused by soil liquefaction, for example) without being overstressed or damaged. In addition, the Marine Terminal does not have any tall structures. Tall structures can be subject to damage in an earthquake if liquefaction occurs because of higher overturning movement and loss of soil support. Minor settlement could be possible, but the design of these facilities accommodates minor settlement, and no significant damage is anticipated. In the unlikely event of damage to facilities, this would possibly result in spills of crude oil or petroleum products. The frequency of these events would increase under the proposed project as the amount of material loaded and unloaded, and therefore the time to load/unload the materials at the Marine Terminal, could increase under the proposed Project. This would be a potentially significant impact and would remain significant after the implementation of **MMs GEO-1a through GEO-1c** identified above.

Incorporating earthquake-resistant design into newly engineered facilities and implementing recommended mitigation measures can reduce impacts from liquefaction. However, it is economically infeasible to build facilities that are completely resistant to liquefaction damage associated with major or great earthquakes in southern California. Therefore, potential adverse impacts are unavoidable and would remain significant.

Summary. This impact remains potentially significant following application of all feasible mitigation.

CEQA FINDING No. LUPR-1

EIR Section 4.7, **LAND USE, PLANNING, AND RECREATION**		Class
Impact No.:	**LUPR-1: Accidental Oil Releases Could Affect Recreational Activities**	**I**
Finding(s):	(1) Changes or alterations have been required in, or incorporated into, the Project that avoid or substantially lessen the significant environmental effect as identified in the Final EIR.	

	(2) Such changes or alterations are within the responsibility and jurisdiction of the city of El Segundo and not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by such other agency. (3) Specific economic, legal, social, technological or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the Final EIR.

FACTS SUPPORTING THE FINDING(S)

A number of sensitive habitats and high quality recreational resources in the Project area would be impacted by the spread of oil from an accidental release at the Marine Terminal or from vessels in route to the facilities. Shoreline and water-related uses would be disrupted by oil on the shoreline and in the water and would result in significant impacts. Although normal operating conditions at the Marine Terminal would not impact existing recreational resources, oil spill occurrences have the potential to degrade or preclude the use of shoreline land and/or recreational activity at the site of the spill. The degree of impact is influenced by many factors including, but not limited to, spill location, spill size, type of material spilled, prevailing wind and current condition, the vulnerability and sensitivity of the resource, and response capability.

Oil spill modeling scenarios show that oil spills originating at or near the Terminal would potentially impact the El Segundo area immediately to the east; the shoreline from Dockweiler State Beach Park to Malibu, including Marina Del Rey, Venice Beach, Santa Monica, and other Los Angeles city and county beaches to the north; Manhattan Beach, Hermosa Beach, Redondo Beach, the Palos Verdes Peninsula area, and Los Angeles Harbor to the south; and the Channel Islands to the west. The modeling shows that other areas may be affected by oil under certain wind and current conditions.

The land uses and recreational resources that would be affected by an oil spill depend on the type of oil, size of the spill, and the prevailing wind conditions. The modeling indicates that different scenarios will result in impacts to different areas of the coastline from Long Beach to Malibu and west to the Channel Islands. Typically, a spill would affect areas either to the south, north, or west of the Marine Terminal, or potentially to the south and west alone, or north and west alone.

Recreational facilities within the Long Beach-Malibu-Channel Islands area that are vulnerable to an oil spill accident (i.e., affected by at least one of the model scenarios) include: two boating harbors, Marina Del Rey and King Harbor (Redondo Beach); nine sport fishing locations, Channel Islands, Port Hueneme Dock, Marina Del Rey, Redondo, 22nd Street Landing (San Pedro), Los Angeles Harbor at Berth 79 (San Pedro), Long Beach at Berth 55, Belmont Pier (Long Beach), and Seal Beach at the Municipal Pier; and six fishing and recreational piers, Malibu, Santa Monica, Venice, Manhattan Beach, Hermosa Beach, and Redondo Beach (Monstad Pier).

In addition to the recreational resources located in surrounding areas, recreational uses immediately adjacent to the Marine Terminal would also be affected. Seaward of the Marine Terminal is a sandy beach that is open to the general public, and immediately to the north is El Segundo Beach. This beach area is transected by a Los Angeles County bicycle path connecting Dockweiler State Beach Park on the north and Manhattan Beach to the south. Shoreline and water-related uses at these facilities as well as the Marine Terminal would also be disrupted by the presence of oil on the shoreline and in the water for indefinite periods of time. Recreational activities would be prohibited from resuming until cleanup or dissipation occurs. Additionally, recreational boating activities would cease in the areas affected for potentially long periods of time depending on the amount of oil present and amount of cleanup required. Immediate spill response and containment by booming would also influence the extent of impacted shoreline, with attendant potential impacts on surfers and beachgoers.

A spill by a tanker en route to the Marine Terminal could have devastating consequences for the recreational facilities at Redondo Beach. Under summer prevailing conditions, when visitation to the pier and adjacent beaches peak, winds would blow a spill from an accident off Palos Verdes directly into this recreation area.

Because of the time factor involved in oil dispersion, impacts from spills are considered to be significant (a significant adverse impact that remains significant after mitigation), if first response efforts would not contain or cleanup the spill, resulting in residual impacts that would be visible to the general public on shoreline or water areas. If a spill occurs that would be contained and cleaned during the first response, that spill would be considered a less than significant impact for recreation.

The potential for accidental oil releases to affect recreation activities would be mitigated by adhering to the measures in the OSCP and identified in **MMs SSR-1a, SSR-1b, SSR-2a through SSR-2k, SSR-3, BIO-1a, BIO-1b, BIO-3a, BIO-3b, BIO-4, and BIO-5**. Adherence to the OSCP measures would provide for minimizing oil spills and maximizing cleanup activities to reduce impacts to recreational uses. Through these measures, the risk of accidents can be reduced, and small spills can be rapidly cleaned up. Large spills, however, have the potential to remain as significant impacts.

The potential for a large spill that could not be contained would remain significant. Therefore, the residual impacts would remain significant for those resources still affected by oil spill after the spill event.

Summary. This impact remains potentially significant following application of all feasible mitigation.

CEQA FINDING No. NOI-1

EIR Section 4.8, NOISE		Class
Impact No.:	NOI-1: Construction Could Increase Noise Levels at Beach Areas	II
Finding(s):	(1) Changes or alterations have been required in, or incorporated into, the Project that avoid or substantially lessen the significant environmental effect as identified in the Final EIR. (2) Such changes or alterations are within the responsibility and jurisdiction of the city of El Segundo and the city of Manhattan Beach and not the agency making the finding. Such changes have been adopted by such other agencies or can and should be adopted by such other agencies.	

FACTS SUPPORTING THE FINDING(S)

Noise from the proposed Project pipeline maintenance activities could impact beach areas during construction.

Noise levels at El Segundo Beach during onshore construction activities were estimated using Federal Highway Administration Roadway Construction Noise Model version 1.1 (FHWA 2006). The model estimates that noise levels at the beach could be 83 decibels (dBA) L_{eq} at 50 feet from construction activities on the beach. This would likely represent a noticeable (more than 5 dBA) increase in noise levels above ambient noise without the construction activities and, therefore, could potentially be an impact on beachgoers on El Segundo Beach. This could be considered a significant impact.

Beach visitors could be affected by these noise levels, particularly during high-use weekend and holiday periods. Therefore, a significant impact could occur at these beach locations if construction activities are conducted during the weekend or holidays.

The following impacts would be less than significant: (1) Impacts due to construction at the closest residence in El Segundo would be 53 dBA L_{eq}, which would be less than the city of El Segundo construction limit of 65 dBA; and (2) Offshore activities during the pipeline installation phase, away from the shoreline at the berths, are estimated to generate noise impacts to shoreline areas of 49 dBA L_{eq}.

MM NOI-1 (Construction Noise Mitigation) requires construction activities be limited to the hours between 7:00 A.M. and 6:00 P.M. and not occur during the weekends or on Federal holidays. A Noise Mitigation Plan, as required by the city of El Segundo (General Plan objective N.1-2), shall be prepared by the Applicant to minimize noise impacts on beachgoers. The Noise Mitigation Plan shall be submitted to CSLC staff for review and approval 60 days prior to the start of any construction.

As stated, significant impacts could occur for construction noise due to increases in noise levels for beachgoers to El Segundo Beach during pipeline replacement activities. The municipal code does not specify impacts to beach areas; only impacts to residences. However, construction at the beach could cause disturbances above 5 dBA to beachgoers, particularly during busy weekends and holidays. Therefore, mitigation measures have been proposed that would restrict the time and duration of construction activities to minimize the noise effects on beachgoers.

Summary. With the mitigation described above, the impact is reduced to a less than significant level.

CEQA FINDING No. CUL-1

EIR Section 4.10, CULTURAL RESOURCES		Class
Impact No.:	**CUL-1: Damage to or Disruption of Prehistoric or Historic Resources**	**II**
Finding(s):	(1) Changes or alterations have been required in, or incorporated into, the Project that avoid or substantially lessen the significant environmental effect as identified in the Final EIR.	

FACTS SUPPORTING THE FINDING(S)

Construction, modification of pipelines, and operation may damage, disrupt, or adversely affect an important prehistoric or historic archaeological resource such that its integrity could be compromised or eligibility for future listing on the CRHR diminished.

Continued operation of the Marine Terminal during the 30-year lease term will not require physical modification as a part of this action. However, during minor excavation and grading activities associated with regular maintenance activities or if pipeline rearrangement or replacement was required, cultural resources might be encountered in previously undisturbed areas, especially since a detailed cultural resources survey of the sea floor in the area of the pipelines has not been conducted.

In particular, due to lower sea levels during prehistoric times, there is a potential for prehistoric sites in Santa Monica Bay to be affected by the Project (Pierson 1987). In terms of prehistoric sites, "... predictive modeling indicates that intact archaeological deposits may be found on the Outer Continental Shelf in and around paleo-embayments, paleo-estuaries, and paleo-drainages where preservation by terrestrial sedimentation took place prior to sea level encroachment." The existing pipelines may or may not be located near such sites. Physical modification of the pipelines by replacing or rearranging may disturb offshore archaeological resources. This would cause a significant impact that would be reduced to a less-than-significant level with the implementation of **MMs CUL-1a, CUL-1b, and CUL-1c**.

During occasional construction and regular maintenance, impacts to cultural resources are not likely to occur, since the cultural resources report provided by the Southern Central Coastal Information Center indicated that no archaeological resources exist on or within one-half mile (0.8 km) of the Project site. While not expected, the potential exists to unearth undocumented resources during these routine activities. If physical pipeline modifications or other construction activities are required during the lease term, before such activities are undertaken, cultural resources mitigation measures would be implemented in phases. Impacts would be significant, but would be reduced to less than significant with implementation of the following mitigation measures.

MM CUL-1a (Cultural Resources Avoidance Plan) requires that 60 days prior to the start of any construction activities, if any structure 45 years and older will be affected by the proposed Project, the structure shall be assessed and evaluated for potential historical significance, including, but not limited to, eligibility for listing under the California Register of Historical Resources (CRHR). If the resource is determined to be eligible for listing in the CRHR, a cultural resources avoidance plan shall be prepared to identify means to avoid impacts to cultural resources, if feasible. If avoidance is determined to be infeasible, a research and recovery plan shall be prepared. In the event that archaeological resources are unearthed during Project subsurface activities, all earth-disturbing work within a 200-meter radius must be temporarily suspended or redirected until an archaeologist has evaluated the nature and significance of the find. After the find has been appropriately mitigated, work in the area may resume. This shall be an ongoing process during construction (as applicable).

MM CUL-1b (Phase I Field Reconnaissance) requires that prior to finalization of the location for pipeline rearrangement or replacement and 60 days prior to the start of any construction, Phase I field reconnaissance of the offshore Marine Terminal area will gather geophysical data, including magnetometer and side scan sonar runs to identify any cultural resources. Shallow water scuba surveys may be required in areas that vessels cannot access. Findings from the analyses of the geophysical data will be compared with archival information and databases maintained by the CSLC and BOEMRE. This shall be an ongoing process during construction (as applicable).

MM CUL-1c (Phase II Resource Evaluation) requires that if resources that will be impacted are encountered and identified in Phase I, Phase II will evaluate the resource as to its eligibility to the CRHR by a qualified marine archaeologist. For offshore resources, this phase consists of a survey of the identified resources using a Remotely Operated Vehicle or scuba reconnaissance, if necessary, to collect further information about the resource, such as intactness, formal identification, and information necessary to provide an evaluation of its significance to California history. This evaluation shall occur 60 days prior to the start of any construction and shall be an ongoing process during construction (as applicable).

MM CUL-1d (Phase III Cultural Resources Avoidance Plan) states that Phase III would be necessary if the resource is determined to be eligible for listing in the CRHR. 60 days prior to the start of any construction, a cultural resources avoidance plan shall be prepared to identify means to avoid impacts to cultural resources, if feasible, including modifications to the location of the pipelines. If avoidance is determined to be infeasible, a research and recovery plan shall be prepared. In the event that archaeological resources are unearthed during Project subsurface activities, all earth disturbing work within a 200-meter radius must be temporarily suspended or redirected until an archeologist has evaluated the nature and significance of the find. After the find has been appropriately mitigated, work in the area may resume. This shall be an ongoing process during construction (as applicable).

Implementing **MMs CUL-1a through CUL-1d** would require complying with procedures designed to reduce any potential impacts to archaeological and historical resources to a level that is less than significant. This would be done by acquiring geophysical data for offshore resources, determining eligibility of resources to the CRHR, avoiding any identified resources if feasible, researching and recovering materials if required, and suspending work until findings can be evaluated by a qualified archeologist so as not to damage or remove resources in an unauthorized manner.

Summary. With the mitigation described above, the impact is reduced to a less than significant level.