Environmental Topic	Impact(s)	Mitigation	Conclusion
Aesthetics (Visual Resources) - Construction	**PROJECT SPECIFIC:** Construction of the LNG terminal facilities would have a permanent but not significant impact on visual resources. Although there are a substantial number of potential mobile and stationary viewers and visibility is high in some locations, the LNG facilities would be seen in the context of the existing industrial facilities at the POLB and would not adversely affect the viewshed from sensitive locations or change the character of the landscape in terms of either physical characteristics or land uses. Construction of the pipeline and electric distribution facilities would not result in significant impacts on visual resources. **CUMULATIVE: :** All of the projects identified in table 4.12-1 would be constructed in highly developed areas associated with the ports and Cities of Long Beach and Los Angeles. Construction and operation of new buildings or structures associated with these projects, including those at the LNG terminal, would have a permanent effect on visual resources. The cumulative impacts would not be significant, however, because the facilities would be seen in the context of the existing facilities in the area and would not adversely affect the viewshed from sensitive locations or change the character of the landscape in terms of either physical characteristics or land uses. The existing facilities at the ports of Long Beach and Los Angeles would screen, backdrop, and otherwise minimize the overall visual impact of these projects to less than significant levels.	No mitigation measures provided.	Less than significant
Aesthetics (Visual Resources) - Operation	**PROJECT SPECIFIC:** Operation of the LNG terminal facilities would have a permanent but not significant impact on visual resources. Although there are a substantial number of potential mobile and stationary viewers and visibility is high in some locations, the LNG facilities would be seen in the context of the existing industrial facilities at the POLB and would not adversely affect the viewshed from sensitive locations or change the character of the landscape in terms of either physical characteristics or land uses. Operation of the pipeline and electric distribution facilities would not result in significant impacts on visual resources. **CUMULATIVE:** All of the projects identified in table 4.12-1 would be constructed in highly developed areas associated with the ports and Cities of Long Beach and Los Angeles. Construction and operation of new buildings or structures associated with these projects, including those at the LNG terminal, would have a permanent effect on visual resources. The cumulative impacts would not be significant, however, because the facilities would be seen in the context of the existing facilities in the area and would not adversely affect the viewshed from sensitive locations or change the character of the landscape in terms of either physical	No mitigation measures provided.	Less than significant

Environmental Topic	Impact(s)	Mitigation	Conclusion
	characteristics or land uses. The existing facilities at the ports of Long Beach and Los Angeles would screen, backdrop, and otherwise minimize the overall visual impact of these projects to less than significant levels.		
Air Quality - Construction	**PROJECT SPECIFIC:** Construction emissions associated with the Long Beach LNG Import Project would be caused by tailpipe emissions from worker vehicles and supply trucks, as well as construction equipment and fugitive dust. The South Coast Air Quality Management District (SCAQMD) significance thresholds would be exceeded for all criteria pollutants except sulfur oxides (SOx) on a peak daily and quarterly basis. The exceedances are considered a significant impact. To reduce project construction emissions from onsite diesel-fueled combustion equipment, SES' contract specifications would require that all off-road diesel-fueled equipment powered by compression ignition engines meet or exceed the various emission standards in accordance with table 1 of Title 40 CFR Part 89.112. For all other equipment, contract specifications would require that the newest equipment in the construction contractors' fleets be used to take advantage of the general reduction in emission factors that occurs with each model year. SES would also adhere to the POLB's air quality requirements and construction standards some of which include the use of electric-powered dredges for all hydraulic dredges and ultra-low sulfur or emulsified diesel in all other types of dredges, construction phasing to minimize concurrent use of construction equipment, turning equipment off when not in use, watering specifications, restrictions on soil excavation and hauling in windy conditions, suspension of construction activities during Stage II smog alerts, and speed limit restrictions. In addition to SES' proposed control measures, the Agency Staffs will recommend to their respective Commissions that SES require all contractors to use ultra-low sulfur or CARB-approved alternative diesel fuel in all diesel-powered equipment used onsite during construction. The construction workforce would be relatively small (peak of about 404 workers) and would primarily consist of workers from within the Los Angeles and Orange County labor pool. The workers would commute to the temporary laydown and worker parking area on Ocean Boulevard and would then be transported to the site via buses. Materials and equipment would be shipped to the site by road, rail, or barge or to the temporary laydown area on Ocean Boulevard. The Agency Staffs will recommend to their respective Commissions that SES use alternative-fuel buses to transport workers to and from the temporary laydown and worker parking area.	SES shall: • require all contractors to use ultra-low sulfur or California Air Resources Board-approved alternative diesel fuel in all diesel-powered equipment used onsite during construction; and • use alternative-fuel buses to transport workers to and from the temporary laydown and worker parking area. Although implementation of the environmental staffs of the Federal Energy Regulatory Commission (Commission or FERC) and the POLB (Agency Staffs') recommended mitigation measure would reduce emissions during the construction phase of the project, impacts on air quality during construction are still expected to remain significant.	Project specific and cumulatively significant

Environmental Topic	Impact(s)	Mitigation	Conclusion
	Although implementation of SES' control measures and the mitigation measures recommended by the Agency Staffs would reduce emissions during the construction phase, the impacts of the project on air quality during construction are still expected to remain significant. Construction impacts would, however, be temporary and intermittent and cease at the end of the construction phase. **CUMULATIVE:** All of the existing or proposed projects would have air emissions associated with construction and most would have air emissions during operation of the facilities. With the exception of the Pike at Rainbow Harbor (formerly the Queensway Bay Master Plan), all of the projects that have undergone environmental review would have emissions that represent significant impacts even after the incorporation of mitigation measures recommended by the SCAQMD. Air emissions associated with the Long Beach LNG Import Project are also expected to remain significant after implementation of SES' proposed control measures and the Agency Staffs' recommended mitigation measures. During construction of the proposed project, the SCAQMD significance thresholds would be exceeded for all criteria pollutants except SOx on a peak daily and quarterly basis. As a result, the existing and proposed projects are assumed to have both individually and cumulatively significant impacts on air quality.		
Air Quality - Operation	**PROJECT SPECIFIC:** The project's operational emissions would exceed the daily SCAQMD significance thresholds for nitrogen oxides (NOx), reactive organic compounds (ROC), particulate matter having an aerodynamic diameter of 10 microns or less (PM10), and SOx. Additionally, although dispersion modeling results for the facility vaporization equipment and the project as a whole indicate that the operation of the facility would have a minimal impact on the existing air quality in the vicinity of the proposed project area, the predicted impacts from operational emissions would potentially worsen an existing violation of the ambient air quality standards for PM10 and particulate matter having an aerodynamic diameter of 2.5 microns or less (PM2.5) even after implementation of all of SES' proposed control measures. Consequently, the project's impact would be considered significant for ozone (NOx and ROC), PM10, PM2.5, and SOx. The project's impact would not be considered significant for carbon monoxide (see section 4.9.5). A conformity analysis must be conducted by the lead federal agency if a federal action would result in the generation of emissions that would exceed the conformity threshold levels (*de minimis*) of the pollutant(s) for	• Given the nature of the project operations, especially vessel operations, the Agency Staffs have determined that there are no additional feasible measures that would further reduce air emissions. • SES shall complete a full air quality analysis and identify any mitigation requirements necessary for a finding of conformity with the applicable SIP and AQMP. SES shall file documentation supporting conformity with the Secretary of the Commission (Secretary) before the end of the draft environmental impact statement/environmental impact report (EIS/EIR) comment period for review and analysis in the final EIS/EIR.	Project specific and cumulatively significant

Environmental Topic	Impact(s)	Mitigation	Conclusion
	which an air basin is in non-attainment. A conformity analysis must show that the emissions would conform to the State Implementation Plan (SIP) and would not reduce air quality in the air basin, which can be demonstrated through offsets, SIP provisions, or modeling. Documentation supporting conformity has not been filed with the FERC. Until this information is provided by SES, the Long Beach LNG Import Project is deemed to not conform with the applicable SIP and Air Quality Management Plan (AQMP) (see section 4.9.6). In accordance with SCAQMD Rule 1401, a Health Risk Assessment of toxic air contaminant emissions on humans was conducted for the water heaters associated with the vaporization equipment, the unloading of the LNG ships at berth (vessel activities during that period are referred to as hotelling), movement of the LNG ships within the SCAQMD's boundary, tugboats, pilot boats, Coast Guard escort boats, and idling emissions from the LNG trailer trucks that would load at the terminal. The proposed project would not exceed cancer risk level significance thresholds established by the SCAQMD for toxic air pollutant health impacts. **CUMULATIVE:** All of the existing or proposed projects would have air emissions associated with construction and most would have air emissions during operation of the facilities. With the exception of the Pike at Rainbow Harbor (formerly the Queensway Bay Master Plan), all of the projects that have undergone environmental review would have emissions that represent significant impacts even after the incorporation of mitigation measures recommended by the SCAQMD. Air emissions associated with the Long Beach LNG Import Project are also expected to remain significant after implementation of SES' proposed control measures and the Agency Staffs' recommended mitigation measures. During operation, the project's net emissions after SCAQMD-required emission offsets and implementation of SES' proposed control measures would exceed the daily SCAQMD significance thresholds for NOx, ROC, PM10, and SOx. As a result, the existing and proposed projects are assumed to have both individually and cumulatively significant impacts on air quality. A Health Risk Assessment of toxic air contaminant emissions on humans was conducted for the Long Beach LNG Import Project in accordance with SCAQMD Rule 1401. The Health Risk Assessment concluded that the proposed project would not individually exceed cancer risk level significance thresholds established by the SCAQMD for toxic air pollutant health impacts; however, the total carcinogenic risk in the SCAB and the		

Environmental Topic	Impact(s)	Mitigation	Conclusion
	Port areas currently exceeds thresholds of significance based on data gathered in the MATES II Study. Therefore, even though project-specific toxic air pollutant health impacts would not be significant, it is likely that the incremental increase in the cancer risk level for toxic air pollutants as a result of the proposed project would contribute to an existing cumulatively significant health impact in the south-central Los Angeles area, the harbor area, and near freeways		
Biological Resources – Construction	**PROJECT SPECIFIC:** Due to the highly developed nature of the POLB and the lack of vegetative habitats, the terrestrial environment in the project area supports few wildlife species. Individuals in the area are acclimated to the industrial nature of the POLB, routinely experience disturbance associated with Port activities, and would likely relocate into adjacent habitats. The project would not have a measurable impact on the local population of any species. Activities associated with dredging could potentially affect marine organisms by destroying the benthic infauna of the dredged sediments and temporarily displacing mobile organisms, such as fish. In addition to the direct disturbances to the bottom substrates, dredging activities would temporarily increase turbidity and the presence of suspended sediments in the water column, which could indirectly affect marine organisms. However, monitoring of larger dredging projects within San Pedro Bay has shown that turbidity associated with dredging is short term and localized and that compliance with the requirements of the Regional Water Quality Control Board's Waste Discharge Requirements and the ACOE's section 404 permit results in minimal turbidity. The short-term loss of benthic organisms in a small portion of the harbor is generally recognized as an insignificant impact on aquatic resources and benthic communities would be expected to repopulate following the completion of construction activities. Activities associated with the reinforcement of the shoreline structures and construction of the LNG ship berth and unloading facility could directly affect benthic and fish species during the removal or installation of any in-water structures (e.g., pilings, underwater rock buttress). Individuals of non-mobile species attached to hard substrates that are removed or covered would suffer mortality. However, these species are relatively widespread throughout the harbor and would recolonize new hard substrates within 2 to 3 years. Noise could impact marine organisms that occur in the project	The Spill Procedure specifies BMPs that would minimize the chances of a spill and, if a spill were to occur, minimize the chances of the spill reaching a waterbody. Additionally, the Spill Procedure includes measures to minimize impacts if a spill does occur and reaches a waterbody. Implementation of SES' Spill Procedure would reduce impacts on marine organisms associated with a hazardous spill or leak to less than significant levels.	Less than significant

Environmental Topic	Impact(s)	Mitigation	Conclusion
	area within Long Beach Harbor. Project vessels operating within Long Beach Harbor could create sounds that lead to responses in fish. Additionally, specific construction activities (e.g., driving steel piles) could also generate underwater sound pressure waves that potentially kill, injure, or cause a behavioral change in fish in the immediate vicinity of the construction activities. Given the abundance of fish in the harbor despite continuous maritime activity, marine organisms found in the project area have generally adapted to these conditions. There is also the potential for spills, leaks, or accidental releases of potentially hazardous materials to occur during construction of the proposed project. SES' Spill Procedure specifies BMPs that would minimize the chances of a spill and, if a spill were to occur, minimize the chances of the spill reaching a waterbody and affecting marine organisms. Dredging and construction activities associated with the Long Beach LNG Import Project would affect water-associated birds through disruptive noise and/or temporary loss or degradation of foraging habitats in the marine waters of the West Basin. Birds found in the area are acclimated to these types of activities and would use similar habitats in adjacent areas. Consultation with the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries) identified the proposed project area as designated essential fish habitat (EFH) for the Coastal Pelagics and Pacific Groundfish Management Plans. Fourteen of the 86 species managed under these two plans are known to occur in Long Beach Harbor and could be affected by the proposed project. Although disturbance of an estimated 11.9 acres of sea floor and the temporary resuspension of sediments into the water column during dredging activities could potentially adversely affect EFH (resulting in avoidance by adults and some loss of larval northern anchovy in the immediate vicinity of the dredging activity), implementation of the control measures and management practices proposed by SES or required by the regulatory agencies would serve to avoid or minimize impacts on EFH. Additionally, construction impacts would be temporary and turbidity levels would return to baseline conditions following construction. Seven species listed as federally threatened or endangered potentially occur in the project area. The California brown pelican,		

Environmental Topic	Impact(s)	Mitigation	Conclusion
	California least tern, and leatherback sea turtle are federally listed endangered species and the western snowy plover, green sea turtle, olive Ridley sea turtle, and loggerhead sea turtle are federally listed threatened species. Both the U.S. Fish and Wildlife Service and NOAA Fisheries provided comments indicating that federally listed threatened or endangered species would not likely be adversely affected by the proposed project and the FERC staff concurs with these determinations. Three state-listed endangered species, the American peregrine falcon, the California brown pelican, and the California least tern, have been identified as potentially occurring in the proposed project area. The California brown pelican and the California least tern are also federally listed species and, as discussed above, would not likely be adversely affected by the project. Construction and operation of the Long Beach LNG Import Project could disturb the American peregrine falcon through temporary loss or degradation of foraging habitat and disruptive noise from construction and operation of the project facilities. However, peregrine falcons in the project area have become acclimated to POLB operations, including construction and dredging activities as evidenced by their continued use of the local bridges for nesting. In addition, the proposed project would not result in the permanent loss or degradation of existing foraging habitat or significantly increase existing noise levels during construction and operation. Construction of the pipelines would not impact marine organisms because in-water disturbances would be avoided by using the HDD method to cross the Cerritos Channel and an above-water pipe rack at the Dominguez Channel. **CUMULATIVE:** Construction and operation of the Long Beach LNG Import Project would not result in the permanent loss of marine habitat; however, other projects identified in table 4.12-1 involve the creation of up to 508 acres of new land that would cause a permanent loss of marine habitat. These habitat alterations are increments caused by continued expansion of the ports and, collectively, are considered a significant impact. However, because the proposed project would not involve loss of marine habitat, it would not contribute to that impact. The 17 projects involving in-water activity have the potential to affect federally designated EFH in the harbor through construction-related turbidity and disturbance and, in the long term, the loss of up to 508 acres of open water. Even when all projects are considered cumulatively, the construction impacts would not be significant because of the control measures that would be employed (e.g., measures to reduce dredging		

Environmental Topic	Impact(s)	Mitigation	Conclusion
	impacts, implementing storm water pollution and spill prevention procedures, using special construction techniques to minimize in-water disturbance) and the small scale of disturbance relative to the extent of the habitat.		
Biological Resources - Operation	**PROJECT SPECIFIC:** Due to the highly developed nature of the POLB and the lack of vegetative habitats, the terrestrial environment in the project area supports few wildlife species. Individuals in the area are acclimated to the industrial nature of the POLB, routinely experience disturbance associated with Port activities, and would likely relocate into adjacent habitats. The project would not have a measurable impact on the local population of any species. **CUMULATIVE:** Construction and operation of the Long Beach LNG Import Project would not result in the permanent loss of marine habitat; however, other projects identified in table 4.12-1 involve the creation of up to 508 acres of new land that would cause a permanent loss of marine habitat. These habitat alterations are increments caused by continued expansion of the ports and, collectively, are considered a significant impact. However, because the proposed project would not involve loss of marine habitat, it would not contribute to that impact. The increased volumes of international cargo that present and reasonably foreseeable marine terminal projects are intended to accommodate would increase the number and size of ships that call at the ports of Long Beach and Los Angeles. In either case, the volumes of ballast water those ships would carry could increase the possibility that exotic marine species would be introduced into San Pedro Bay. This issue has been addressed at the federal and state levels, resulting in the institution of a program of mandatory ballast water exchange and reporting. The program covers all ships calling at California ports from overseas. Despite these measures, the exotic species issue remains potentially considerable as a result of the cumulative impacts of continuing port development and growth in international trade. The ships associated with the Long Beach LNG Import Project, however, are not expected to contribute to this cumulative impact. The ships would arrive at the terminal facility fully loaded with LNG from locations throughout the Pacific region. To maintain a constant draft during the unloading operation, the LNG ship would bring on ballast water during transfer of its LNG cargo and retain this ballast water until after the LNG ship departs the harbor. The absence of ballast water discharges within the harbor would decrease the potential for importing an exotic species during operation of the Long Beach LNG Import Project.	The Spill Procedure specifies BMPs that would minimize the chances of a spill and, if a spill were to occur, minimize the chances of the spill reaching a waterbody. Additionally, the Spill Procedure includes measures to minimize impacts if a spill does occur and reaches a waterbody. Implementation of SES' Spill Procedure would reduce impacts on marine organisms associated with a hazardous spill or leak to less than significant levels.	Less than significant

Environmental Topic	Impact(s)	Mitigation	Conclusion
	Seven species listed as federally threatened or endangered were identified as potentially occurring in the San Pedro Bay area. Of these seven species, there is a low potential for five to occur in the project area (the western snowy plover and the green, Ridley, loggerhead, and leatherback sea turtles). The other two species, the California brown pelican and the California least tern, are water-dependent birds that are common in San Pedro Bay and could be affected by the cumulative impacts associated with increasing development of the harbor complex. The California brown pelican, however, does not rely on the bay for breeding or nesting. In addition, roosting or feeding pelicans are generally acclimated to operations in the ports of Long Beach and Los Angeles, including construction and dredging activities. As a result, increasing development does not appear to represent a cumulatively significant impact on this species. A large colony of California least terns nests on Pier 400 in the POLA and has traditionally foraged in the shallow water habitat west of the Navy Mole in Los Angeles and Long Beach harbors. The potential cumulative impact on the food supply from construction activities and loss of habitat associated with land fills is an issue that the ports and the applicable resource agencies have addressed through the consultation process under section 7 of the ESA. The Long Beach LNG Import Project would not result in the permanent loss or degradation of existing habitats and, therefore, would not contribute to cumulative impacts on this species. American peregrine falcons are state-listed endangered species that are primarily found near large bodies of water where they feed on water birds. American peregrine falcons forage regularly in Los Angeles and Long Beach Harbors, and several pairs of peregrine falcons are known to nest within and near the ports of Los Angeles and Long Beach. Potential cumulative impacts on the American peregrine falcon could occur as a result of loss or degradation of foraging habitat and disruptive noise from construction and operation of multiple projects in the area. However, peregrine falcons in the project area have become acclimated to POLB operations, including construction and dredging activities. In addition, the Long Beach LNG Import Project would not result in the permanent loss or degradation of existing foraging habitat or significantly increase existing noise levels during construction and operation. Therefore, the proposed project would not contribute to cumulative impacts on this species.		
Cultural Resources	**PROJECT SPECIFIC:** The FERC and the POLB, in consultation with	The FERC and the POLB, in consultation	Less than significant

Environmental Topic	Impact(s)	Mitigation	Conclusion
	the State Historic Preservation Office, have determined that there would be no impact on any properties listed, or eligible for listing, on the National Register of Historic Places or the California Register of Historical Resources or on any unique archaeological resources for the proposed project; therefore, no mitigation would be required. SES prepared an Unanticipated Discovery Plan to be used during construction. The plan describes the procedures that would be employed in the event previously unidentified cultural resources or human remains are encountered during construction. SES' continued cooperation with Native American tribes who were identified by the California Native American Heritage Commission as potentially having knowledge of cultural resources in the project area should address any tribal issues associated with the proposed project. **CUMULATIVE:** The majority of the project would be constructed in a previously developed portion of the Port that is largely underlain by deep, man-placed fill materials, with unconsolidated fluvial and alluvial deposits beneath the northern extent of the pipelines. Therefore, no undisturbed fossils are present near the ground surface in the project vicinity and fossil-bearing rock units would not be encountered during construction of the proposed facilities, including excavation for the pipelines. The Long Beach LNG Import Project would have no impact on paleontological resources.	with the SHPO, have determined that there would be no impact on any properties listed, or eligible for listing, on the NRHP or the CRHR or on any unique archaeological resources for the proposed project; therefore, no mitigation would be required.	
Geology - Construction	**PROJECT SPECIFIC:** The project area is underlain by fill materials, alluvial and marine sediments, sedimentary rocks, and metamorphic basement rocks. Construction of the LNG terminal, electric distribution facilities, and pipelines would occur primarily within near-surface non-native fill deposits and unconsolidated soils and sediments. Therefore, construction and operation of the Long Beach LNG Import Project would not materially alter the geologic conditions of the area or worsen existing unfavorable geologic conditions. All active and abandoned petroleum production wells would be identified in the field just prior to the commencement of construction. The Agency Staffs reviewed the current engineering designs for the LNG storage tanks and other critical terminal structures. These designs are of sufficient detail to demonstrate that the project facilities would withstand the seismic hazards that could affect the site when they are constructed to the specifications of the plans. SES would ensure that final engineering designs also meet or exceed applicable seismic standards, and would provide the final plans to the FERC and the POLB for review and approval before construction. The POLB would construct the shoreline	The facilities would also comply with the seismic design provisions of the California Building Code, of which some of the more notable requirements include design procedures for seismic isolation systems and additional requirements for liquefaction mitigation foundations and superstructure-to-foundation connections. By complying with these applicable codes and design criteria, the facility could operate after all but the most extreme earthquake scenarios.	Less than significant

Environmental Topic	Impact(s)	Mitigation	Conclusion
	structures to meet the stringent seismic design criteria developed for the site, and stone columns would be installed between the shoreline structures and the LNG storage tanks, thereby providing the required lateral support to limit displacement and minimize stress and strain levels well within the design limits of the LNG storage tanks and other heavy load structures in the event of an earthquake. Regional subsidence due to ongoing hydrocarbon production is effectively monitored and controlled and, therefore, would not affect construction or operation of the project **CUMULATIVE:** Several of the projects would affect geological resources in the San Pedro Bay area through the creation of up to 508 acres of new land for marine terminals. The new land would alter the geomorphology of the bay. A century of port development has already created several thousand acres of similar artificial land that overlies natural formations. The additional land created by these projects would only incrementally add to the existing artificial formations in the area and would not be significant. The remaining projects, including the proposed project, would redevelop existing land and would not materially alter the geologic conditions of the area or worsen existing unfavorable geologic conditions. As a result, these projects would represent an insignificant cumulative impact on geological resources. The creation of additional land associated with the marine terminal projects and installation of the proposed LNG storage tanks on top of previously placed fill materials would create conditions that would be more susceptible to seismic hazards than natural formations because the fill materials consist of hydraulically placed fine sand and silt. This risk is inherent in the construction of such fills in a seismically active area such as southern California and would be addressed in the design process for each project. Each project would be constructed and operated in accordance with all applicable codes and regulations to minimize impacts associated with seismic hazards.		
Geology - Operation	**PROJECT SPECIFIC:** The potential for tsunamis or surface rupture to affect the project facilities is very low and, therefore, no specific mitigation is proposed. Geologic hazards present in the project area are related to seismic activity and historical subsidence associated with petroleum production in the area. Seismic activity could potentially damage the LNG terminal site facilities, shoreline structures, and pipeline and electric distribution facilities through strong shaking or secondary ground deformation such as liquefaction, shaking-induced settlement, or	No mitigation for geology was provided.	Less than significant

Environmental Topic	Impact(s)	Mitigation	Conclusion
	lateral spreading. SES conducted a detailed analysis that resulted in seismic design criteria that meet the POLB requirements and exceed the Office of Pipeline Safety and the FERC requirements as specified in National Fire Protection Association 59A (2001). This analysis indicates that an earthquake of Richter magnitude M9.0 on the Palos Verde fault or M7.5 on the THUMS-Huntington Beach fault would be necessary to generate ground motions strong enough to rupture the LNG storage tanks and release their contents. These events have estimated return intervals of approximately 15,000 years and, therefore, are extremely unlikely to occur during the 50-year life of the project. **CUMULATIVE:** Several of the projects would affect geological resources in the San Pedro Bay area through the creation of up to 508 acres of new land for marine terminals. The new land would alter the geomorphology of the bay. A century of port development has already created several thousand acres of similar artificial land that overlies natural formations. The additional land created by these projects would only incrementally add to the existing artificial formations in the area and would not be significant. The remaining projects, including the proposed project, would redevelop existing land and would not materially alter the geologic conditions of the area or worsen existing unfavorable geologic conditions. As a result, these projects would represent an insignificant cumulative impact on geological resources. The creation of additional land associated with the marine terminal projects and installation of the proposed LNG storage tanks on top of previously placed fill materials would create conditions that would be more susceptible to seismic hazards than natural formations because the fill materials consist of hydraulically placed fine sand and silt. This risk is inherent in the construction of such fills in a seismically active area such as southern California and would be addressed in the design process for each project. Each project would be constructed and operated in accordance with all applicable codes and regulations to minimize impacts associated with seismic hazards. A description of the design options for the proposed project is presented in section 4.1.4.3.		
Soils and Sediments	**PROJECT SPECIFIC:** Because of the highly developed, industrial nature of the area and the presence of mostly fill materials under the majority of the project facilities, the project would not reduce soil productivity by compaction or soil mixing. However, construction of the project facilities would temporarily expose the fill materials on the affected	Underground pipelines that serve oil wells in the area could be encountered during project construction. All active and inactive pipelines encountered during LNG terminal site preparation would be	Less than significant

Environmental Topic	Impact(s)	Mitigation	Conclusion
	portion of Terminal Island and the native soils at the end of the pipeline routes to the effects of wind, rain, and runoff, which could cause erosion and sedimentation in the area. Erosion control measures proposed for the Long Beach LNG Import Project are detailed in SES' Sediment Control Plan that is included in its Storm Water Pollution Prevention Plan (SWPPP). Existing soils at the LNG terminal site are not capable of adequately supporting the LNG storage tanks or other heavy load structures. As a result, SES proposes to install deep-driven pile foundations beneath the LNG storage tanks and other heavy load structures to meet the stringent static-settlement criteria for the structures at the LNG terminal. Other soil improvements at the site would include the installation of approximately 3,380 stone columns to depths of 60 to 80 feet below ground surface between the shoreline structures and the security barrier wall and an additional approximately 2,000 stone columns to a depth of 60 feet below ground surface between the security barrier wall and the LNG storage tanks. In addition to excavation for the soil improvements, construction of the project would involve excavation for the LNG spill impoundment systems and other utilities and foundations at the LNG terminal site, and trenching for the pipeline and electric distribution facilities. Contaminated soil and other hazardous materials could be encountered during any of these activities. If hazardous substances are encountered during construction, SES would notify the POLB. SES, in consultation with the POLB, would comply with all applicable environmental regulations. Before construction, SES and the pipeline contractor(s) would submit work plans that outline appropriate environmental site investigation and remediation activities to the appropriate agencies for approval. The work plans would include a site-specific Health and Safety Plan, Sampling and Analysis Plan, Project Contractor Quality Control Plan, and an Environmental Protection Plan that would also include a Waste Management Plan. Spills or leaks of fuels, lubricants, or other hazardous substances during construction and/or operation of the project could also have an impact on soils. This potential impact is expected to be minor, however, because of the typically low frequency, volume, and extent of spills or leaks, and because of the hazard detection system and other safety controls designed to prevent or contain spills and leaks at the LNG terminal site. Implementation of SES' Spill Procedure included in its SWPPP would further reduce the likelihood of a significant spill or leak occurring during construction or operation of the project, and would reduce the impact of	relocated, removed, or abandoned in place using a sand-cement slurry after review of their location and approval by the project geotechnical engineer and pipeline owner. Before construction, SES would submit an application to the DOGGR to conduct a Construction Site Review to identify and manage all active and abandoned petroleum production wells. Through the Construction Site Review process, the DOGGR assists in identifying and managing oil and gas wells located near or beneath proposed structures by specifying procedures for: • locating wells, including records review and the use of test pits and magnetometer surveys, if necessary; • surveying and identifying wells on site plans; • testing of accessible, abandoned wells on the construction site for gas and oil leaks; and • plugging and abandonment, or re-abandonment of wells, if necessary. Upon completion of any required well work and the Construction Site Review process, the DOGGR would affix either a Division certification or review stamp to the construction plans and forward a copy of the approved plans to the local permitting agency to assist in the issuance of local construction permits. SES would ensure that the construction contractor applies for the Construction Site Review and abides by the DOGGR's requirements. Implementation of these measures would reduce any potential	

Environmental Topic	Impact(s)	Mitigation	Conclusion
	any spill or leak that may occur. Disturbance of the West Basin sediments during in-water activities would temporarily resuspend sediments in the water column, which could cause turbidity. An increase in sediment and turbidity levels could adversely affect water quality and aquatic organisms. Resuspension of contaminated sediments could also impact marine organisms in the area. The POLB has recently negotiated a consent agreement with the California Department of Toxic Substances Control (DTSC) for its concurrence with the Installation Restoration Site 7 (West Basin) sediment remediation. Accordingly, the dredging associated with the project would be done only with the concurrence of the DTSC. Turbidity levels would return to baseline conditions after dredging operations were completed. Disposal suitability issues would be addressed in compliance with the EPA/ACOE *Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. – Testing Manual*. Disturbance of the West Basin sediments could also encounter ordnance. Any ordnance found during dredging for the proposed project would be handled in accordance with federal regulations and the POLB's procedures. **CUMULATIVE**: Construction of the on-land portions of the projects would expose fill materials and/or native soils to the effects of wind, rain, and runoff, which could cause erosion and sedimentation in the area. These effects would be temporary, limited primarily to the period of construction, and highly localized. Cumulative impacts on soils would only occur if other projects are constructed at the same place and time as the proposed project facilities. The demolition of buildings and the removal of pavement associated with the Long Beach Naval Complex Disposal and Reuse Project would be the only other project that would occur at the same place as the proposed project. These activities would be completed before SES' initiation of activities associated with the Long Beach LNG Import Project. In addition, all of the projects would be required to implement appropriate erosion control measures. As a result, no cumulative impacts on soils are anticipated. Disturbance of the sediments in Long Beach or Los Angeles Harbors during in-water activities would temporarily resuspend sediments in the water column, which could result in localized increases in turbidity. An increase in sediment and turbidity levels could have a cumulative impact on water quality and aquatic organisms (see sections 4.12.3 and 4.12.4, respectively).	impacts on oil production in the area associated with construction and operation of the proposed project to less than significant levels. Conversely, ongoing petroleum production would have no significant impact on the operation of the LNG facility because ground subsidence due to petroleum production in the area has been, and will continue to be, controlled through water injection (see section 4.1.4.2).	
Water Resources - Construction	**PROJECT SPECIFIC:** Potential operational impacts on groundwater include an accidental spill or leak of hazardous materials during operation of the project facilities and water requirements for the LNG terminal	Implementation of SES' Spill Procedure included in its SWPPP would reduce the likelihood of a significant spill or leak	Mitigated to less than significant.

Environmental Topic	Impact(s)	Mitigation	Conclusion
	vaporization process, firewater system, and miscellaneous potable water needs. All of the operational water required for the LNG terminal would be obtained from the POLB and the City of Long Beach municipal water system. SES would negotiate with the City of Long Beach or a local supplier to determine appropriate fees and to ensure that the project would have no impact on water availability in the area. Operational impacts on water quality include the potential to contribute additional pollutants to the waterbody via accidental spills or leaks of hazardous materials, storm water runoff, or an LNG spill. There would be no intake or discharge of sea water during operation of the project facilities. **CUMULATIVE:** Activities associated with construction of the proposed project facilities, including hydrostatic test water appropriation, the installation of deep-driven pile foundations and stone columns at the LNG terminal site, the horizontal directional drills (HDDs) of the Cerritos Channel, site excavation and dewatering, and accidental spills or leaks of hazardous materials could adversely affect groundwater quality within the project area. SES would minimize the potential for these impacts by negotiating project water requirements with the City of Long Beach for appropriate fees and mitigation measures; driving, rather than excavating, the foundation piles at the LNG terminal site and installing a cement plug at the base of each stone column in order to prevent the creation of an opening where potential cross-contamination could occur; implementing its HDD Plan; identifying and protecting all underground piping in the construction area; evaluating all dewatered material for contamination prior to removal in accordance with the Health and Safety Plan and Sampling and Analysis Plan; and implementing its Spill Procedure to address preventive and mitigative measures that would be used to minimize the potential impact of a hazardous spill during construction of the project facilities.	occurring during operation of the project, and would reduce the impact of any spill or leak that may occur. In accordance with its SWPPP, best management practices (BMPs) consisting of permanent features and operational practices designed or implemented to minimize the discharge of pollutants in storm water or non-storm water flows from the LNG terminal site would be implemented to reduce the potential operation-related impacts on surface water resources.	
Water Resources - Operation	**PROJECT SPECIFIC:** Potential operational impacts on groundwater include an accidental spill or leak of hazardous materials during operation of the project facilities and water requirements for the LNG terminal vaporization process, firewater system, and miscellaneous potable water needs. All of the operational water required for the LNG terminal would be obtained from the POLB and the City of Long Beach municipal water system. SES would negotiate with the City of Long Beach or a local supplier to determine appropriate fees and to ensure that the project would have no impact on water availability in the area. **CUMULATIVE:** Operational impacts on water quality attributable to cumulative development in the San Pedro Bay area could occur as a result	The measures in SES' Spill Procedure would reduce the potential impacts on groundwater associated with a hazardous spill or leak during project operation.	Mitigated to less than significant.

Environmental Topic	Impact(s)	Mitigation	Conclusion
	of storm water runoff. Runoff is subject to stringent controls and BMPs as required by the general industrial NPDES permit program and the applicable municipal storm water permits administered by the Cities of Los Angeles and Long Beach. Implementation of the BMPs would reduce the cumulative impacts associated with the projects identified in table 4.12-1 to less than significant levels. Dredging activities would remove contaminated sediments for appropriate disposal. This could minimize the total amount of contaminated sediments in contact with the marine environment. Dredging permits for all of the projects would include measures to prevent significant resuspension of contaminants into the water column and ensure that sediments are handled and disposed of properly (e.g., monitoring and reporting programs to ensure that significant levels of contaminants would not be released to the harbor waters or adversely affect beneficial uses of the harbor). Because all of the projects would be subject to strict operational controls (e.g., specifications for the storage of fuel and other hazardous liquids; requirements for inspection of equipment for leaks and deterioration; and notification, response, and cleanup procedures in the event of a spill), they are not likely to contribute to substantial sediment contamination in the future.		
Land Use and Planning - Construction	**PROJECT SPECIFIC:** A total of 88.0 acres of land would be affected during construction of the Long Beach LNG Import Project (56.9 acres for the LNG terminal facilities, 30.1 acres for the pipeline facilities, and 1.0 acre for the electric distribution facilities). Of the 88.0 acres of land affected by construction of the project, 37.0 acres would be permanently affected during operation of the project facilities (32.1 acres associated with the LNG terminal, 3.9 acres associated with the pipelines, and 1.0 acre associated with the electric distribution facilities). The LNG terminal would be an industrial use that generally conforms to the overall goals of the current PMP, local zoning ordinances, and relevant regional plans and would be consistent with existing surrounding uses. However, an amendment to the PMP would be necessary to accommodate the LNG facility because LNG is not an expressly identified “hazardous cargo” as permitted within Terminal Island Planning District 4. The pipeline and electric distribution facilities would be an industrial/utility use that is consistent with existing surrounding uses and conforms to the overall goals of the current PMP, local zoning ordinances, and relevant regional plans. All of the land and marine uses immediately adjacent to and within 1 mile of the proposed project facilities are associated with the	No mitigation measures were provided.	Less than significant

Environmental Topic	Impact(s)	Mitigation	Conclusion
	industrial activities of the ports of Long Beach and Los Angeles or the Cities of Long Beach, Los Angeles, and Carson. No permanent residences are located within the POLB or the Port of Los Angeles. The closest potential residences are in a recreational vehicle park about 1.3 miles east-northeast of the LNG terminal site and possibly live-aboard boats at two marinas in the East Basin of the Cerritos Channel between 1.2 and 1.6 miles northwest of the LNG terminal. **CUMULATIVE:** All of the projects identified in table 4.12-1 would be consistent with the land use polices and designations of the Cities of Long Beach and Los Angeles and their respective ports. In the harbor area, the projects would be industrial or commercial and port-related, which would conform to the approved PMPs. The LNG terminal would be an industrial use that generally conforms to the overall goals of the current PMP, local zoning ordinances, and relevant regional plans and would be consistent with existing surrounding uses. However, an amendment to the PMP would be necessary to accommodate the LNG facility because LNG is not an expressly identified "hazardous cargo" as permitted within Terminal Island Planning District 4 of the POLB. The projects in the City of Long Beach would be consistent with existing commercial and residential uses and conform to the city's zoning and land use plans. As a result, the combination of identified projects would not significantly contribute to cumulative impacts on land use.		
Population/Housing and Public Services (Socioeconomic)	**PROJECT SPECIFIC:** Construction of the project would result in a temporary increase in population and the demands on temporary housing, public services, and utilities and service systems. Due to the temporary and limited nature of these impacts they are not considered significant. Of the 60 full-time workers SES would hire to operate the project facilities, about 54 workers are expected to be from the local area. Therefore, operation of the project would not have a significant impact on population or the demand for housing. Because LNG would be a new product to the POLB, it would also be new to the local fire and emergency response services. SES is working with local emergency providers to develop procedures to handle potential fire emergencies and is working with the Long Beach City Fire Department (LBFD) to provide hazard control and firefighting training that is specific to LNG and LNG vessels. SES has also committed to funding all necessary security/emergency management equipment and personnel costs that would be imposed on state and local agencies as a result of the project and would prepare a comprehensive plan that identifies the mechanisms for funding these costs. These measures should adequately equip the LBFD to handle any type of	No mitigation measures were provided.	Less than significant

Environmental Topic	Impact(s)	Mitigation	Conclusion
	emergency at the proposed LNG terminal. Construction and operation of the project would have a beneficial impact on local tax revenues. **CUMULATIVE:** The present and reasonably foreseeable future projects could cumulatively impact socioeconomic conditions in the project area, including population, employment, and housing; public service systems; utilities and service systems; and environmental justice. Population, Employment, and Housing – The Long Beach LNG Import Project would not result in potentially significant impacts on population, employment, or housing; therefore, significant cumulative impacts would not occur as a result of this project in combination with the other projects identified in table 4.12-1. Public Service Systems – The existing and proposed projects identified in table 4.12-1 may increase the demand for police and fire protection in the region. The increased demand would be consistent with the overall pattern of growth that the Cities of Long Beach and Los Angeles incorporate into their planning processes. Construction of the Long Beach LNG Import Project would not add to the cumulative demand for public services because the non-local workforce would be small relative to the current population. However, the proposed project would introduce a new product (i.e., LNG) to the POLB that also would be new to the local fire and emergency response services; therefore, operation of the project could add to cumulative impacts on the local public service systems in the event of an emergency at the LNG terminal. As discussed in section 4.6.5, the NASFM, the OPS, and the OEP are developing an LNG safety module that will be added to the firefighter safety program to train the local fire services. In addition, SES is working with local emergency providers to develop procedures to handle potential fire emergencies and is working with the LBFD to provide hazard control and firefighting training that is specific to LNG and LNG vessels. SES has also committed to funding all necessary security/emergency management equipment and personnel costs that would be imposed on state and local agencies as a result of the project and would prepare a comprehensive plan that identifies the mechanisms for funding these costs. These measures should adequately equip the LBFD to handle any type of emergency at the proposed LNG terminal. As a result, the proposed project would not significantly contribute to cumulative impacts on public service systems. A discussion of cumulative impacts on emergency response times is presented in section 4.12.13. <u>Utilities and Service Systems</u> – The proposed project would not result in		

Environmental Topic	Impact(s)	Mitigation	Conclusion
	potentially significant impacts on utility and service systems; therefore, significant cumulative impacts would not occur as a result of the proposed project in combination with the other projects identified in table 4.12-1. Environmental Justice – Although the City of Long Beach could be characterized as poorer than average and has an over 50 percent minority population, there is no evidence that the project would result in cumulative impacts on any racial, ethnic, or socioeconomic group because the facilities would be located primarily within an existing industrial area associated with the POLB. In addition, all of the projects identified in table 4.12-1 would be consistent with the land use polices and designations of the Cities of Long Beach and Los Angeles and their respective ports as well as with the past development of the ports. A Health Risk Assessment was conducted to evaluate the potential for impacts on human health associated with air toxics (see section 4.9.7). The assessment concluded that the impact of the Long Beach LNG Import Project on human health risks would be less than significant; however, toxic air pollutants resulting from the project would likely contribute to cumulative air quality impacts in the SCAB (see section 4.12.11). As discussed in section 4.12.11, it is likely that the incremental increase in the cancer risk level for toxic air pollutants as a result of the proposed project would contribute to an existing cumulatively significant health impact in the SCAB. These health impacts could disproportionately affect the environmental justice communities located near the project area.		
Noise - Construction	**PROJECT SPECIFIC:** The noise associated with construction activities would be intermittent because equipment would be operated on an as-needed basis. Construction activities at the LNG terminal and along the routes of the pipelines and electric distribution facilities would generate short-term increases in sound levels during daylight hours when construction activities would occur. The strongest source of sound during construction would be noise associated with installing deep-driven pile foundations beneath the LNG storage tanks and other heavy load structures to meet the stringent static-settlement criteria for the LNG storage tanks and other heavy load structures at the LNG terminal. Although the noise levels at the property boundary during this activity would be higher than existing noise levels, the impacts would be short term and would be contained within the industrial area immediately surrounding the LNG terminal site within the POLB. **CUMULATIVE:** Construction and operation of the projects identified in table 4.12-1 would contribute noise and vibration to the environment and may raise the overall noise level as a result of increasing the intensity of	No mitigation measures were provided.	Less than significant

Environmental Topic	Impact(s)	Mitigation	Conclusion
	site activities within the ports of Long Beach and Los Angeles and the City of Long Beach. If more than one project is constructed in the same place at the same time, cumulative impacts on noise could occur. As previously discussed, the demolition of buildings and the removal of pavement associated with the Long Beach Naval Complex Disposal and Reuse Project would be the only other project that would occur at the same place as the proposed project and those activities would be completed before SES' initiation of activities associated with the Long Beach LNG Import Project. In addition, the activities associated with all of the projects would be required to comply with applicable noise ordinances. Therefore, the cumulative impacts on noise and vibration would be considered less than significant.		
Noise - Operation	**PROJECT SPECIFIC:** The major noise-producing equipment associated with operation of the LNG terminal would be the boil-off gas compressors, primary and secondary booster pumps, water pumps and heaters, instrument air compressors, and fans for the heaters. Noise control measures included in the design of the LNG terminal facilities consist of buildings, barrier walls, and tanks to provide the appropriate level of noise screening. The predicted operational noise level is below the FERC limit of 55 decibels of the A-weighted scale (dBA) day-night sound level (Ldn) at the nearest noise-sensitive area (NSA). The predicted property boundary noise level is below the City of Long Beach noise limit of 70 dBA. To ensure that the actual noise resulting from the operation of the LNG terminal is below the FERC limit of 55 dBA Ldn at any nearby NSAs and the City of Long Beach property boundary noise limit of 70 dBA, the Agency Staffs will recommend to their respective Commissions that SES conduct a noise survey to verify that the noise from the LNG terminal when operating at full capacity does not exceed these limits. **CUMULATIVE:** Construction and operation of the projects identified in table 4.12-1 would contribute noise and vibration to the environment and may raise the overall noise level as a result of increasing the intensity of site activities within the ports of Long Beach and Los Angeles and the City of Long Beach. If more than one project is constructed in the same place at the same time, cumulative impacts on noise could occur. During operation, the facilities associated with the proposed project would not produce vibrations and would be located over 1 mile from the nearest NSAs. In addition, the activities associated with all of the projects would be required to comply with applicable noise ordinances. Therefore, the cumulative impacts on noise and vibration would be considered less than significant.	Noise control measures included in the design of the LNG terminal facilities consist of buildings, barrier walls, and tanks to provide the appropriate level of noise screening.	Less than significant
Recreation	**PROJECT SPECIFIC:** Although the Long Beach area provides several opportunities for recreational activities, the immediate area surrounding the	No mitigation measures were provided.	Less than significant

Environmental Topic	Impact(s)	Mitigation	Conclusion
	LNG terminal site, pipelines, and electric distribution facilities does not provide for recreational activities due to the industrial nature of the Port and the adjacent area to the north. Construction and operation of the Long Beach LNG Import Project would not threaten the viability of a recreational resource, prohibit access to recreational resources, or cause termination of a recreational use. **CUMULATIVE:** Several of the existing or proposed projects would enhance recreational and leisure facilities and opportunities in the region (e.g., the Cabrillo Marine Aquarium Expansion, Cabrillo Way Marina - Phase II, Fishing Reef, San Pedro Waterfront Promenade, and hotel developments). While none of the existing or proposed industrial or commercial projects would displace any recreational facilities, continued port development may have a minor cumulative impact on recreational opportunities. The Long Beach LNG Import Project is not expected to contribute to any cumulative impacts on recreational activities because it would not adversely affect waters currently used for recreation.		
Solid/Hazardous Waste	**PROJECT SPECIFIC:** The Long Beach Naval Shipyard and Station are listed as hazardous waste sites. The Navy also documented soil contamination in the area during closure of its Long Beach Complex. Several other hazardous waste sites were identified within 0.25 mile of the pipeline routes and electric distribution facilities. Because none of these sites would be crossed by the proposed facilities, Phase I Environmental Assessments were not conducted. No discussion on solid waste was provided. **CUMULATIVE:** No cumulative analysis of solid/hazardous waste was provided.	Contaminated soils associated with these or other undocumented hazardous waste sites could be encountered during construction of the proposed facilities. SES and the pipeline contractor(s) would develop procedures that would outline appropriate environmental site investigation and remediation activities and submit them to the appropriate agencies for approval before construction. Additional details on contaminated soils and sediments near the proposed facilities and on SES' proposed control measures are provided in sections 4.2.2 and 4.2.3, respectively.	Less than significant
Reliability and Safety - Construction	**PROJECT SPECIFIC:** Based on the analyses of the thermal radiation from the storage tanks and the trailer truck loading storage tank, several exclusion zone distances [as required by Title 49 Code of Federal Regulations (CFR) Part 193] extend beyond the property line of the facility that can be built upon. Although no prohibited activities or buildings currently exist within these exclusion zones, according to Title 49 CFR Part 193, either a government agency or SES must be able to exercise legal control over activities in these areas for as long as the facility is in operation.	The following measures shall apply to the LNG terminal design and construction details. Information pertaining to these specific recommendations shall be filed with the Secretary for the review and written approval of the Director of OEP either: prior to initial site preparation; prior to construction of final design; prior to commissioning; or prior to commencement of service as specified in	Mitigated to less than significant.

Environmental Topic	Impact(s)	Mitigation	Conclusion
	The POLB owns the land surrounding the LNG terminal site but leases parcels to other tenants. At this time, there is no assurance of limiting the type of activities that occur outside of the proposed terminal site within the exclusion zones (see section 4.11.5). As a result of the FERC staff's cryogenic design and technical review of information provided by SES, a number of concerns were identified relating to the reliability, operability, and safety of the proposed LNG terminal (see section 4.11.6). **CUMULATIVE:** Impacts on reliability and public safety would be mitigated through the implementation of applicable federal, state, and local rules and regulations for each individual project. The specific rules and regulations that apply to each individual project would ensure that the applicable design standards are implemented to protect the public and to prevent accidents and failures. The LNG terminal facilities would be sited, designed, constructed, operated, and maintained in compliance with the federal safety standards. The pipelines and aboveground facilities associated with the Long Beach LNG Import Project would be designed, constructed, operated, and maintained in accordance with DOT Minimum Federal Safety Standards in Title 49 CFR Part 192. Several of the present or reasonably foreseeable future projects, including the proposed project, would involve cargo terminals that could be expected to ship hazardous materials. Accidents involving such materials represent a potential impact on public safety. Continued growth in international commerce is likely to result in increased quantities of hazardous materials being shipped to and from the region.	each recommendation below. This information shall be submitted a minimum of 30 days before approval to proceed is required. • A complete plan and list of the hazard detection equipment shall be filed prior to initial site preparation. The information shall include a list with the instrument tag number, type and location, alarm locations, and shutdown functions of the proposed hazard detection equipment. Plan drawings shall clearly show the • location of all detection equipment. • Prior to initial site preparation, SES shall file a technical review of its facility design that: a. identifies all combustion/ventilation air intake equipment and the distance(s) to any possible hydrocarbon release (LNG, flammable refrigerants, flammable liquids, and flammable gases); and b. demonstrates that these areas would be adequately covered by hazard detection devices and indicates how these devices would isolate or shut down any combustion equipment whose continued operation could add to or sustain an emergency. • A complete plan and list of the fixed and wheeled dry-chemical, fire extinguishing, and high expansion foam hazard control equipment shall be filed prior to initial site preparation. The information shall include a list with the equipment tag number, type, size, equipment covered, and automatic and manual remote signals initiating discharge of the units. Plan drawings shall clearly show the	

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		planned location of all fixed and wheeled extinguishers. • The final design of the hazard detection equipment shall identify manufacturer and model. • The final design of the hazard detection equipment shall include redundancy and fault detection and fault alarm monitoring in all potentially hazardous areas and enclosures. • The final design of the hazard detection equipment shall provide flammable gas and ultraviolet/infrared hazard detectors with local instrument status indication as an additional safety feature. • The final design of the fixed and wheeled drychemical, fire extinguishing, and high expansion foam hazard control equipment shall identify manufacturer and model. • The final design shall include equipment and instrumentation for the measurement of translational and rotational movement of the inner vessel for use during and after cool down. • The final design shall include a minimum of three onsite seismic instruments that would have the capability of actuating an automatic plantwide emergency shutdown in the event of seismic activity approaching the site Contingency Level Earthquake. SES shall specify the set point to be used. • In the final design all structures, besides the LNG storage tanks, shall be designed to withstand the effects of an Operating Basis Earthquake, as	

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		required by Title 49 CFR Part 193 and National Fire Protection Association (NFPA) 59A (2001), and, further, the condition of these structures shall not adversely affect the stability and integrity of the tanks in the Safe Shutdown Earthquake event. • The final design shall include details of the LNG tank tilt settlement and differential settlement limits between each LNG tank and piping and procedures to be implemented in the event thatlimits are exceeded. • The final design shall include drawings and specifications of the piping support structure of the LNG storage tanks. • The final design shall include provisions to ensure that hot water circulation is operable at all times when LNG is present in the secondary LNG booster pump discharge piping or when the temperature in the LNG inlet channel to any vaporizer is below 35 degrees Fahrenheit. • The final design shall include detection instrumentation and shutdown procedures for vaporizer tube leak, shell side overpressure, or bursting disc failure. • The final design shall include provisions to drain the fractionation systems to safe locations. • The final design shall ensure that air gaps are installed downstream of all seals or isolations installed at the interface between a flammable fluid system and an electrical conduit or wiring system. Each air gap shall vent to a safe location and be equipped with a leak detection device that: would	

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		continuously monitor for the presence of a flammable fluid; would alarm the hazardous condition; and would shut down the appropriate systems. • The final design shall include a fire protection evaluation carried out in accordance with the requirements of NFPA 59A, Chapter 9.1.2. • The final design shall include details of the shutdown logic, including cause and effect lists for alarm and shut down. • The final design shall include emergency shutdown of equipment and systems activated by hazard detection devices for flammable gas, fire, cryogenic spills, and earthquake, when applicable. • The final design shall include procedures for offsite contractors' responsibilities, restrictions, limitations, and supervision of the contractors by SES staff. • Security personnel requirements prior to and during LNG vessel unloading shall be filed prior to commissioning. • An operation and maintenance manual and safety procedure manual shall be filed prior to commissioning. • Copies of the U.S. Coast Guard (Coast Guard)- approved Facility Security Plan and LNG Vessel Operation and Emergency Contingency Plan shall be filed prior to commissioning. • The contingency plan for failure of the outer • LNG tank containment shall be filed prior to commissioning. • The final detailed drawings of the transfer line impoundment systems, including cross sections, shall be filed	

Environmental Topic	Impact(s)	Mitigation	Conclusion
		prior to commissioning. • A copy of the criteria for horizontal and rotational movement of the inner vessel for use during and after cool down shall be filed prior to commissioning. • The FERC staff and Coast Guard shall be notified of any proposed revisions to the security plan and physical security of the facility prior to commencement of service. • Progress on the construction of the LNG terminal shall be reported in monthly reports filed with the Secretary. Details shall include a summary of activities, problems encountered, and remedial actions taken. Problems of significant magnitude shall be reported to the FERC within 24 hours.	
Reliability and Safety - Operation	**PROJECT SPECIFIC:** The arrival, transit, cargo transfer, and departure of LNG ships in the POLB could have an impact on safety in the Port (see section 4.11.7.4). Some commentors have expressed concern that the local community would have to bear some of the cost of ensuring the security of the LNG facility and the LNG vessels while in transit and unloading at the berth (see section 4.11.7.4).. The WSA would be prepared well before import operations would commence, and the Port's overall operation/security situation may change over that time period. New Port activities may commence, infrastructure may be added, or population density may change. Improvements in technology to detect, deter, and defend against intentional acts may also be developed (see section 4.11.7.4). SES has not indicated that it would hire a separate security staff (in addition to its permanent security staff) to conduct periodic patrols of the plant, screen visitors and contractors, and assist in maintaining security of the marine terminal during cargo unloading (see section 4.11.8).	The following measures shall apply throughout the life of the facility: • The facility shall be subject to regular FERC staff technical reviews and site inspections on at least a biennial basis or more frequently as circumstances indicate. Prior to each FERC staff technical review and site inspection, SES shall respond to a specific data request including information relating to possible design and operating conditions that may have been imposed by other agencies or organizations. Up-to-date detailed piping and instrumentation diagrams reflecting facility modifications and provision of other pertinent information not included in the semi-annual reports described below, including facility events that have taken place since the previously	Mitigated to less than significant.

Environmental Topic	Impact(s)	Mitigation	Conclusion
	Emergency response and evacuation planning procedures need to be in place to minimize impacts associated with a potential incident at the LNG terminal see section 4.11.9). **CUMULATIVE:** It is difficult to evaluate the cumulative risk that such growth represents or has represented. In addition, it is difficult to measure the cumulative risk for an intentional attack on the Port or the LNG facility. As discussed in section 4.11.10, the POLB Quest Study reported that the historical probability of a successful terrorist event would be less than seven chances in a million. The addition of the LNG facility and its associated LNG ships would not significantly change the risk of an intentional attack on the POLB. It is reasonable to assume that the rate of ship accidents (including those involving the release of hazardous materials) is likely to rise with more vessel traffic, which could cumulatively increase the risk of an accident having an impact on public safety. As previously discussed, the Los Angeles-Long Beach Marine Exchange and the Coast Guard established a VTS that manages vessel traffic and increases safety in southern California waters. The Coast Guard would also enforce a security zone around LNG ships. These and other operational controls by the Coast Guard, VTS, and Jacobsen Pilots and the characteristics of the POLB would minimize the risk of accidents involving LNG ships. Furthermore, the implementation of federal, state, and local rules and regulations concerning security and the results of the WSA with its associated operations and Emergency Response Plan would minimize the risk to the POLB and the LNG operation. Emergency response time is a key aspect of public health and safety. Projects that increase traffic congestion or interfere with access are the most likely source of adverse impacts on response times. None of the projects identified in table 4.12-1 where the environmental analysis has been completed is expected to cause an increase in response times for emergency services. Cumulative impact on one intersection, combined with the traffic associated with the proposed project, would likely result in significant impacts during construction. However, no significant cumulative impacts on emergency services are expected because sufficient emergency services and facilities exist in the area to accommodate cumulative projects, and because of mitigation measures that would reduce the cumulative traffic impact at this intersection (see sections 4.7.2.3 and 4.12.9). No significant cumulative impacts on emergency services are expected during operation of the proposed project. Section 4.11.9 includes the Agency Staffs' recommendation that SES prepare an Emergency Response Plan and coordinate procedures with local emergency planning	submitted annual report, shall be submitted. • Semi-annual operational reports shall be filed with the Secretary to identify changes in facility design and operating conditions, abnormal operating experiences, activities (including ship arrivals, quantity and composition of imported LNG, vaporization quantities, boil-off/flash gas, etc.), and plant modifications including future plans and progress thereof. Abnormalities shall include, but not be limited to: unloading/shipping problems, potential hazardous conditions from offsite vessels, storage tank stratification or rollover, geysering, storage tank pressure excursions, cold spots on the storage tanks, storage tank vibrations and/or vibrations in associated cryogenic piping, storage tank settlement, significant equipment or instrumentation malfunctions or failures, nonscheduled maintenance or repair (and reasons therefore), relative movement of storage tank inner vessels, vapor or liquid releases, fires involving natural gas and/or from other sources, negative pressure (vacuum) within a storage tank, and higher than predicted boiloff rates. Adverse weather conditions and the effect on the facility also shall be reported. Reports shall be submitted within 45 days after each period ending June 30 and December 31. In addition to the above items, a section entitled "Significant plant modifications proposed for the next 12 months (dates)" also shall be included	

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	groups, the ports of Long Beach and Los Angeles, fire departments, state and local law enforcement, the Coast Guard, and other appropriate federal agencies to be used in the event of an incident. As discussed in sections 4.6.5 and 4.11.7.4, SES has committed to funding all necessary security/emergency management equipment and personnel costs that would be imposed on state and local agencies as a result of the project and would prepare a comprehensive plan that identifies the mechanisms for funding these costs. With the implementation of the coordination procedures in the Emergency Response Plan and the funding of additional emergency management equipment and personnel, no cumulative impacts would be expected on emergency response services during operation of the proposed project.	in the semi-annual operational reports. Such information would provide the FERC staff with early notice of anticipated future construction/maintenance projects at the LNG facility. • In the event the temperature of any region of any secondary containment, including imbedded pipe supports, becomes less than the minimum specified operating temperature for the material, the Commission shall be notified within 24 hours and procedures for corrective action shall be specified. • Significant non-scheduled events, including include: a. fire; b. explosion; c. estimated property damage of $50,000 or more; d. death or personal injury resulting in patient hospitalization; e. free flow of LNG for 5 minutes or more that results in pooling; f. unintended movement or abnormal loading by environmental causes, such as an g. earthquake, landslide, or flood, that impairs the serviceability, structural integrity, or h. reliability of an LNG facility that contains, controls, or processes gas or LNG; i. any crack or other material defect that impairs the structural integrity or reliability of an LNG facility that contains, controls, or processes gas or LNG; j. any malfunction or operating error that causes the pressure of a pipeline	

Environmental Topic	Impact(s)	Mitigation	Conclusion
		or LNG facility that contains or processes gas or LNG to rise above its maximum allowable operating pressure (or working pressure for LNG facilities) plus the build-up allowed for operation of pressure limiting or control devices; k. a leak in an LNG facility that contains or processes gas or LNG that constitutes an emergency; l. inner tank leakage, ineffective insulation, or frost heave that impairs the structural integrity of an LNG storage tank; m. any safety-related condition that could lead to an imminent hazard and cause (either directly or indirectly by remedial action of the operator), for purposes other than abandonment, a 20 percent reduction in operating pressure or shut down of operation of a pipeline or an LNG facility that contains or processes gas or LNG; n. safety-related incidents to LNG vessels occurring at or en route to and from the LNG facility; or o. an event that is significant in the judgment of p. the operator and/or management even though it did not meet the above criteria or the guidelines set forth in an LNG facility's incident management plan. In the event of an incident, the Director of OEP has delegated authority to take whatever steps are necessary to ensure operational reliability and to protect human life, health, property, or the environment, including authority to direct the LNG facility to cease operations.	

Environmental Topic	Impact(s)	Mitigation	Conclusion
		Following the initial company notification, the FERC staff would determine the need for a separate follow-up report or follow up in the upcoming semi-annual operational report. All company follow-up reports shall include investigation results and recommendations to minimize a reoccurrence of the incident. Prior to issuance of the final EIS, SES shall submit a Preliminary and Follow-on Waterway Suitability Assessment (WSA) to the Captain of the Port Coast Guard Sector Los Angeles-Long Beach for review and validation and provide a copy to the FERC staff and validation and provide a copy to the FERC staff. • Concurrent with the submission of the Follow-on WSA to the FERC staff, SES shall file its comprehensive plan identifying the mechanisms for funding all project-specific security/emergency management costs that would be imposed on state and local agencies with the FERC and the POLB for the review and written approval of the Director of OEP in consultation with the POLB Director of Planning. • SES shall annually review its WSA for the project, update the assessment to reflect changing conditions, provide the updated assessment to the Captain of the Port Coast Guard Sector Los Angeles-Long Beach for review and validation, and provide a copy to the FERC staff.	

Environmental Topic	Impact(s)	Mitigation	Conclusion
		• SES shall provide a separate 24-hours-per-day security staff and coordinate with the Coast Guard to define the responsibilities of SES' security staff in supplementing other security personnel and in protecting the LNG ships and terminal. • SES shall develop emergency evacuation routes for the areas along the route of the LNG vessel transit in conjunction with the local emergency officials and file the routes with the FERC and the POLB for the review and written approval of the Director of OEP in consultation with the POLB Director of Planning prior to initial site preparation. • SES shall also develop an Emergency Response Plan (including evacuation) and coordinate procedures with local emergency planning groups, the ports of Long Beach and Los Angeles, fire departments, state and local law enforcement, the Coast Guard, and other appropriate federal agencies. This plan shall include at a minimum: o designated contacts with state and local emergency response agencies; o scalable procedures for the prompt notification of appropriate local officials and emergency response agencies based on the level and severity of potential incidents; o procedures for notifying residents, employees, and recreational users within areas of potential hazard; o locations of permanent sirens and other warning devices; and o an "emergency coordinator" on each	

Environmental Topic	Impact(s)	Mitigation	Conclusion
		LNG vessel to activate sirens and other warning devices. • The Emergency Response Plan shall be filed with the FERC and the POLB for the review and written approval of the Director of OEP in consultation with the POLB Director of Planning prior to initial site preparation. SES shall notify the FERC and POLB staffs of all planning meetings in advance and shall report progress on the development of its Emergency Response Plan at 3-month intervals.	
Traffic Impacts - Construction	**PROJECT SPECIFIC:** There would be temporary adverse impacts on project area roadways during site preparation and construction. The duration of construction for the liquefied natural gas (LNG) terminal is estimated to be 48 months. During this time, traffic would be generated by trucks transporting materials and equipment to and from the laydown area and project site as well as trucks transporting materials directly to the project site. Construction worker trips would also occur during the construction period. Project construction worker and truck and material haul trips would result in a temporary, short-term significant impact at the intersections of Navy Way and Seaside Avenue (evening only) and Henry Ford Avenue and Anaheim Street (evening only) (see section 4.7.2.2). **CUMULATIVE:** The future baseline traffic conditions discussed in section 4.7.2 were developed by considering the cumulative traffic effects of regional growth and traffic generated by other proposed developments in the POLB area. Traffic associated with construction and operation of the project was then added to the future baseline conditions to develop the cumulative impact scenarios for the proposed project. The traffic analysis is, therefore, representative of a cumulative traffic impact analysis of the proposed project and other reasonably foreseeable growth in traffic. During construction, cumulative traffic occurring in the evening at the Henry Ford Avenue/Anaheim Street intersection is likely to have a significant impact. The proposed Heim Bridge Replacement and State Route 47 Truck Expressway Projects would reduce this impact. However, if these projects do not go forward, the LADOT may require improvements at the Henry Ford Avenue/Anaheim Street [e.g., re-striping portions of the roads and/or imposing parking restrictions (see section 4.7.2.3)]. With implementation	To mitigate the short-term impacts during the evening peak hour, Sound Energy Solutions (SES) shall require that the construction workforce work 6 a.m. to 2:30 p.m. instead of 7 a.m. to 3:30 p.m. With the shift change, the impact at the intersection of Navy Way/Seaside Avenue would be removed but the temporary impact at the Henry Ford Avenue/Anaheim Street intersection would remain between 2 and 3 p.m. Because the impact would be temporary, the Port of Long Beach (POLB) would reassess the Level of Service and the need for improvements with the City of Los Angeles Department of Transportation.	Mitigated to less than significant

Environmental Topic	Impact(s)	Mitigation	Conclusion
	of these mitigation measures, no significant cumulative traffic impact is expected in the area as a result of construction or operation of the proposed project. Cumulative projects could cause an increase in the amount of vessel traffic in San Pedro Bay and its approaches. The POLB currently experiences about 3,085 ship calls, which results in about 6,170 inward and outward ship movements per year. By 2020, this total is expected to increase to between 10,400 and 15,200 inward and outward ship movements. Any increase would represent an increased risk of collision and groundings. To accommodate existing and future vessel traffic and to increase safety, the Los Angeles-Long Beach Marine Exchange and the Coast Guard established a VTS that manages vessel traffic in southern California waters. Because the VTS ensures the capacity of the two ports to handle future vessel traffic safely, the effect of cumulative project development on marine transportation is considered less than significant. In addition, the vessel traffic associated with the Long Beach LNG Import Project (i.e., 120 ship calls per year or 240 inward and outward ship movements) would represent only about 4 percent of current ship traffic and 2 percent of the total projected levels in 2020. As a result, the proposed project would not significantly contribute to cumulative impacts on marine transportation.		
Traffic Impacts - Operation	**PROJECT SPECIFIC:** The Long Beach LNG Import Project would generate a maximum of 120 ship calls and 240 ship movements within the POLB each year. This would typically mean the addition of one ship movement per day on up to 240 days of the year or possibly two ship movements in the event of a rapid discharge call with arrival, discharge, and departure occurring during one calendar day. The increase in ship traffic associated with the LNG terminal could cause vessel traffic congestion within the harbor and/or conflicts with other commercial interests if an LNG ship arrival or departure delays the movement of another vessel, either due to scheduling or traffic management resulting in slow speed or waiting time. Delays experienced by other ships are expected to be temporary and of short duration. In addition, SES would participate with the Coast Guard in the development of procedures to reduce impacts on marine transportation, including implementation of an LNG Vessel Operation and Emergency Contingency Plan that would provide the basis for operation of LNG ships within the POLB. **CUMULATIVE:** The future baseline traffic conditions discussed in section 4.7.2 were developed by considering the cumulative traffic effects of regional growth and traffic generated by other proposed developments in the POLB area. Traffic associated with construction and operation of the	None.	Less than significant

Environmental Topic	Impact(s)	Mitigation	Conclusion
	project was then added to the future baseline conditions to develop the cumulative impact scenarios for the proposed project. The traffic analysis is, therefore, representative of a cumulative traffic impact analysis of the proposed project and other reasonably foreseeable growth in traffic. During construction, cumulative traffic occurring in the evening at the Henry Ford Avenue/Anaheim Street intersection is likely to have a significant impact. The proposed Heim Bridge Replacement and State Route 47 Truck Expressway Projects would reduce this impact. However, if these projects do not go forward, the LADOT may require improvements at the Henry Ford Avenue/Anaheim Street [e.g., re-striping portions of the roads and/or imposing parking restrictions (see section 4.7.2.3)]. With implementation of these mitigation measures, no significant cumulative traffic impact is expected in the area as a result of construction or operation of the proposed project. Cumulative projects could cause an increase in the amount of vessel traffic in San Pedro Bay and its approaches. The POLB currently experiences about 3,085 ship calls, which results in about 6,170 inward and outward ship movements per year. By 2020, this total is expected to increase to between 10,400 and 15,200 inward and outward ship movements. Any increase would represent an increased risk of collision and groundings. To accommodate existing and future vessel traffic and to increase safety, the Los Angeles-Long Beach Marine Exchange and the Coast Guard established a VTS that manages vessel traffic in southern California waters. Because the VTS ensures the capacity of the two ports to handle future vessel traffic safely, the effect of cumulative project development on marine transportation is considered less than significant. In addition, the vessel traffic associated with the Long Beach LNG Import Project (i.e., 120 ship calls per year or 240 inward and outward ship movements) would represent only about 4 percent of current ship traffic and 2 percent of the total projected levels in 2020. As a result, the proposed project would not significantly contribute to cumulative impacts on marine transportation.		