

## EXECUTIVE SUMMARY

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On January 26, 2004, Sound Energy Solutions (SES) filed an application with the Federal Energy Regulatory Commission (Commission or FERC) under section 3 of the Natural Gas Act (NGA) and Part 153 of the Commission's regulations. SES seeks authorization from the FERC to site, construct, and operate a liquefied natural gas (LNG) receiving terminal and associated facilities in the Port of Long Beach (POLB or Port) in Long Beach, California as a place of entry for the importation of LNG. The FERC is the federal agency responsible for authorizing sites for onshore LNG import facilities. As such, the FERC is the lead federal agency for the preparation of the environmental impact statement (EIS). The FERC will use the document to consider the environmental impact that could result if it issues SES an Order Granting Authorization under section 3 of the NGA.

The Board of Harbor Commissioners (BHC) has authority over the City's Harbor District, commonly known as the POLB or Port. The City of Long Beach owns the land within the Harbor District in trust for the people of the State of California. SES would have to obtain a lease from the City of Long Beach to build and operate its proposed Long Beach LNG Import Project. SES submitted an application to the POLB for a Harbor Development Permit on July 25, 2003, seeking approval for a development project within the Port. The application was designated POLB Application No. HDP 03-079. The POLB is the lead agency in California for preparing the environmental impact report (EIR). The BHC will use the document to determine the project's consistency with the certified Port Master Plan (PMP) and the California Coastal Act of 1976 as well as to consider the environmental impact that could result if it issues Harbor Development Permits for the project.<sup>1</sup>

The environmental staffs of the FERC and the POLB (Agency Staffs) have jointly prepared this draft EIS/EIR to assess the environmental impacts associated with the construction and operation of the Long Beach LNG Import Project. The document was prepared in accordance with the requirements of the National Environmental Policy Act (NEPA), the Council on Environmental Quality regulations for implementing the procedural provisions of NEPA [Title 40 Code of Federal Regulations (CFR) Parts 1500-1508], the FERC's regulations implementing NEPA (Title 18 CFR Part 380), the California Environmental Quality Act (CEQA), and the guidelines for the implementation of the CEQA (California Code of Regulations Title 14, section 15000 et seq.). The purpose of this document is to inform the public and the permitting agencies about the potential adverse and beneficial environmental impacts of the proposed project and its alternatives, and to recommend all feasible mitigation measures.

The U.S. Army Corps of Engineers (ACOE) has jurisdictional authority pursuant to section 404 of the Clean Water Act [33 United States Code (USC) 1344], which governs the discharge of dredged or fill material into waters of the United States, and section 10 of the Rivers and Harbors Act (33 USC 403), which regulates any work or structures that potentially affect the navigable capacity of a waterbody. Because the ACOE must comply with the requirements of NEPA before issuing permits under sections 404 and 10, it has elected to act as a cooperating agency with the FERC and the POLB in preparing this EIS/EIR. The ACOE would adopt the EIS/EIR per Title 40 CFR Part 1506.3 if, after an independent review of the document, it concludes that its comments and suggestions have been satisfied.

The U.S. Coast Guard (Coast Guard) within the U.S. Department of Homeland Security exercises regulatory authority over LNG facilities that affect the safety and security of port areas and navigable waterways under Executive Order 10173; the Magnuson Act (50 USC section 191); the Ports and Waterways Safety Act of 1972, as amended (33 USC section 1221, et seq.); and the Maritime Transportation Security Act of 2002 (46 USC section 701). The Coast Guard is responsible for matters

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<sup>1</sup> Some of the activities associated with the project would be conducted by the POLB and would require issuance of a Harbor Development Permit to the POLB as well as to SES.

related to navigation safety, vessel engineering and safety standards, and all matters pertaining to the safety of facilities or equipment located in or adjacent to navigable waters up to the last valve immediately before the receiving tanks. The Coast Guard also has authority for LNG facility security plan review, approval and compliance verification as provided in Title 33 CFR Part 105, and siting as it pertains to the management of vessel traffic in and around the LNG facility. As required by its regulations, the Coast Guard is responsible for issuing a Letter of Recommendation (LOR) as to the suitability of the waterway for LNG marine traffic. The Coast Guard has elected to act as a cooperating agency in the preparation of this EIS/EIR and plans to adopt the document if it adequately covers the impacts associated with issuance of the LOR.

The Pipeline and Hazardous Materials Safety Administration (PHMSA) within the U.S. Department of Transportation has authority to promulgate and enforce safety regulations and standards for the transportation and storage of LNG in or affecting interstate or foreign commerce under the pipeline safety laws (49 USC Chapter 601). This authority extends to the siting, design, installation, construction, initial inspection, initial testing, and operation and maintenance of LNG facilities. The PHMSA's operation and maintenance responsibilities include fire prevention and security planning for LNG facilities under Title 49 CFR Part 193. The PHMSA is participating in the NEPA analysis under the terms of an interagency agreement between the PHMSA, the FERC, and the Coast Guard.

## **PROPOSED ACTION**

LNG is natural gas that has been cooled to a temperature of about -260 degrees Fahrenheit so that it becomes a liquid. Because LNG is more compact than the gaseous equivalent, it can be transported long distances across oceans using specially designed ships. SES proposes to ship LNG from a variety of Asian and other foreign sources to provide a new, stable source of natural gas to serve the needs of southern California, particularly the Los Angeles Basin (LA Basin). The LNG would be unloaded from the ships, stored in tanks at the terminal, and then re-gasified (vaporized) and transported via a new 2.3-mile-long, 36-inch-diameter natural gas pipeline to Southern California Gas Company's (SoCal Gas) existing Line 765. A portion of the LNG would be distributed via trailer trucks to LNG vehicle fueling stations throughout southern California to fuel LNG-powered vehicles.

Natural gas is a mixture of hydrocarbon compounds, principally methane. It also contains small amounts of heavier hydrocarbons, such as propane, ethane (C<sub>2</sub>), and butane, which have a higher heating value than methane. A portion of these components may need to be removed from the LNG that would be stored on the terminal site in order for the natural gas to meet the British thermal units (Btu) and gas quality specifications of SoCal Gas as well as the specifications for LNG vehicle fuel established by the California Air Resources Board (CARB). The components that are removed are called natural gas liquids (NGL). SES has stated that it would accept only lean LNG [i.e., LNG containing fewer heavy (non-methane) hydrocarbons than regular LNG] from its suppliers. However, up to 10,000 million Btu per day of C<sub>2</sub> recovered from the LNG would be vaporized and distributed to ConocoPhillips' existing Los Angeles Refinery Carson Plant (LARC) via a new 4.6-mile-long, 10-inch-diameter pipeline.

Specifically, SES' proposal would involve construction and operation of LNG terminal and pipeline facilities as described below.

The LNG terminal facilities would include:

- an LNG ship berth and unloading facility with unloading arms, mooring and breasting dolphins, and a fendering system;

- two LNG storage tanks, each with a gross volume of 160,000 cubic meters (1,006,000 barrels) surrounded by a security barrier wall;
- 20 electric-powered booster pumps;
- four shell and tube vaporizers using a primary, closed-loop water system;
- three boil-off gas compressors, a condensing system, an NGL recovery system, and an export C<sub>2</sub> heater;
- an LNG trailer truck loading facility with a small LNG storage tank;
- a natural gas meter station and odorization system;
- utilities, buildings, and service facilities; and
- associated hazard detection, control, and prevention systems; site security facilities; cryogenic piping; and insulation, electrical, and instrumentation systems.

The pipeline facilities would include:

- a 2.3-mile-long, 36-inch-diameter pipeline and associated aboveground facilities to transport natural gas from the LNG terminal to the existing SoCal Gas system; and
- a 4.6-mile-long, 10-inch-diameter pipeline and associated aboveground facilities to transport vaporized C<sub>2</sub> from the LNG terminal to the existing ConocoPhillips LARC.

## **PUBLIC INVOLVEMENT AND AREAS OF CONCERN**

On June 30, 2003, SES filed a request with the FERC to implement the Commission's Pre-Filing Process for the Long Beach LNG Import Project. At that time, SES was in the preliminary design stage of the project and no formal application had been filed with the FERC. On July 11, 2003, the FERC granted SES' request and established a pre-filing docket number (PF03-6-000) to place information filed by SES and related documents issued by the FERC into the public record. The purpose of the Pre-Filing Process is to encourage the early involvement of interested stakeholders, facilitate interagency cooperation, and identify and resolve issues before an application is filed with the FERC. After receipt of SES' Harbor Development Permit application on July 25, 2003, the POLB agreed to conduct its CEQA review of the project in conjunction with the Commission's Pre-Filing Process.

As part of the Pre-Filing Process, the FERC and the POLB worked with SES to develop a public outreach plan for issue identification and stakeholder participation. As part of the outreach plan, SES met with local associations, neighborhood groups, and other non-governmental organizations to inform them about the project and address issues and concerns. In coordination with the FERC and the POLB, SES also consulted with key federal and state agencies to identify their issues and concerns.

On September 4, 2003, SES sponsored two public workshops in the Long Beach area. The purpose of the workshops was to inform agencies and the general public about LNG and the proposed project and to provide them an opportunity to ask questions and express their concerns. The FERC and the POLB participated in these workshops and provided information on the joint environmental review process. Invitations to the public workshops were sent to federal, state, and local agencies; elected

officials; environmental groups; affected landowners; and tenants of the POLB. Notices of the public workshops were published in the local newspapers.

Between September 22, 2003 and November 3, 2004, the FERC and/or the POLB issued three separate notices that described the proposed project and invited written comments on the environmental issues to be addressed in the EIS/EIR. The September 22, 2003 notice also announced a joint NEPA/CEQA public scoping meeting that was held in Long Beach on October 9, 2003. All three notices were mailed to federal, state, and local agencies; elected officials; environmental and public interest groups; Native American tribes; affected landowners; POLB tenants; and local libraries and newspapers. Announcements of the public scoping meeting were published in the local newspapers. Each notice opened a formal scoping period for the project.

A transcript of the public scoping meeting and all written comments are part of the public record for the Long Beach LNG Import Project and are available for viewing on the FERC Internet website (<http://www.ferc.gov>).<sup>2</sup> The environmental scoping comments received during the public scoping periods raised issues related to the alternatives analysis, geologic hazards, contaminated soils and sediments, land use, socioeconomics, traffic, air quality, cumulative impacts, and reliability and safety.

This draft EIS/EIR was filed with the U.S. Environmental Protection Agency (EPA), submitted to the California State Clearinghouse, and mailed to federal, state, and local agencies; elected officials; environmental and public interest groups; Native American tribes; affected landowners; POLB tenants; intervenors<sup>3</sup> in the FERC's proceeding; local libraries and newspapers; and other interested parties (i.e., miscellaneous individuals who provided scoping comments or asked to be on the mailing list). A formal notice indicating that the draft EIS/EIR is available for review and comment was published in the Federal Register, posted in the Los Angeles County Clerk's office in California, and sent to the remaining individuals on the mailing list. The public has at least 45 days after the date of publication in the Federal Register to review and comment on the draft EIS/EIR both in the form of written comments and at public meetings to be held in Long Beach. All comments received on the draft EIS/EIR related to environmental issues will be addressed in the final EIS/EIR.

## **ENVIRONMENTAL ISSUES**

The environmental issues associated with construction and operation of the Long Beach LNG Import Project are analyzed in this EIS/EIR using information provided by SES and further developed from data requests; field investigations; scoping; literature research; alternatives analysis; contacts with federal, state, and local agencies; and input from public groups and organizations. The Agency Staffs' analysis indicates that the project would result in certain adverse environmental impacts.

As part of the environmental analysis, specific mitigation measures were identified that are feasible and that, when implemented, would reduce potential adverse impacts of project construction and operation. Table ES-1 at the end of this Executive Summary summarizes the significant impacts of the project and the mitigation measures recommended by the Agency Staffs to reduce the impacts. These impacts are described in detail in section 4.0. A brief summary by resource is provided below.

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<sup>2</sup> Using the "eLibrary" link, select "General Search" from the eLibrary menu and enter the docket number excluding the last three digits in the "Docket Number" field (i.e., PF03-6 and CP04-58). Be sure to select an appropriate date range.

<sup>3</sup> Intervenors are official parties to the proceeding and have the right to receive copies of case-related Commission documents and filings by other intervenors. Likewise, each intervenor must provide 14 copies of its filings to the Secretary of the Commission and must send a copy of its filings to all other intervenors. Only intervenors have the right to seek rehearing of the Commission's decision.

## **Geology**

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 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 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.

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 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.

## **Soils and Sediments**

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 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 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.

## **Water Resources**

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.

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. The measures in SES' Spill Procedure would reduce the potential impacts on groundwater associated with a hazardous spill or leak during project operation. 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.

Activities associated with construction of the project facilities, including reinforcement of the shoreline structures, construction of the LNG ship berth and unloading facility and associated dredging, the HDDs of the Cerritos Channel, installation of the C<sub>2</sub> pipeline over the Dominguez Channel, hydrostatic test water discharge, storm water runoff, and accidental spills or leaks of hazardous materials could adversely affect surface water quality and/or water circulation within Long Beach Harbor. Adherence to the measures of all applicable permits, implementation of the POLB's Dredge and Disposal Plan and SES' HDD Plan and Spill Procedure, as well as disposal of all sediments at approved sites would minimize impacts on water quality. In addition, the Agency Staffs will recommend to their respective Commissions that SES revise its HDD Plan to describe the procedures that would be followed if an existing submerged pipeline is encountered during the HDD operations.

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. Implementation of SES' Spill Procedure included in its SWPPP would reduce the likelihood of a significant spill or leak 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.

## **Biological Resources**

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 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, 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.

### **Land Use, Hazardous Waste, Recreation, and Visual Resources**

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 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.

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.

Although the Long Beach area provides several opportunities for recreational activities, the immediate area surrounding the 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.

Construction and 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. Construction and operation of the pipeline and electric distribution facilities would not result in significant impacts on visual resources.

### **Socioeconomics**

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 emergency at the proposed LNG terminal. Construction and operation of the project would have a beneficial impact on local tax revenues.

## **Transportation**

The duration of construction for the 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. Driveway access to the laydown area is located along Pier S Avenue. Also, construction worker trips would occur during the construction period. These worker trips would total approximately 808 trips (404 in and 404 out) into the area. All construction workers would park adjacent to the laydown area. The construction workers would then be transported via buses to the project site. The transporting of these workers would generate a total of 46 daily bus trips (23 in and 23 out). The transporting of construction equipment and materials would generate approximately 676 daily truck trips (338 in and 338 out) during the most active construction period. These 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). The Agency Staffs will recommend to their respective Commissions that SES require the construction workforce to work 6 a.m. to 2:30 p.m. instead of 7 a.m. to 3:30 p.m. Improvements at the Henry Ford Avenue/Anaheim Street intersection would be implemented if required by the Los Angeles Department of Transportation. Operation of the project would not result in a significant impact on traffic.

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.

## **Cultural Resources**

The FERC and the POLB, in consultation with 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.

## **Air Quality**

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 (SO<sub>x</sub>) 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.

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.

Operational emission sources associated with the project would include marine vessels, vaporization equipment, fugitive process emissions, on-road vehicles, and emergency generator and firewater pumps. The project's operational emissions would exceed the SCAQMD daily emission thresholds for nitrogen oxides (NO<sub>x</sub>), reactive organic compounds (ROC), particulate matter having an aerodynamic diameter of 10 microns or less (PM<sub>10</sub>), and SO<sub>x</sub>. Therefore, the project would be significant for ozone, PM<sub>10</sub>, and SO<sub>x</sub>. The project would not be significant for carbon monoxide. SES proposes to minimize criteria pollutant emissions associated with operation of the Long Beach LNG Import Project through the following control measures: Lowest Achievable Emission Rate/Best Available Control Technology would be applied as needed to the stationary sources; LNG trailer trucks would be LNG-fueled and their engines would be turned off during onsite loading; LNG ships would generate power from combustion of boil-off LNG rather than fuel oil if they are equipped to do so; fugitive ROC emissions from various points in the terminal would be minimized by design elements and through the

implementation of a comprehensive leak detection and repair program; and operational personnel would be encouraged to rideshare and use mass transit.

SES would also ensure that all diesel-powered, non-road mobile terminal equipment would meet the emissions standards set forth in the EPA's Control of Emissions of Air Pollution From Non-Road Diesel Engines and Fuel and require ships calling at the terminal that do not use LNG boil-off gas in the main engines for power during unloading to use fuels such as the CARB's #2 diesel, gas-to-liquid diesel, biofuels, or a marine distillate fuel, in the ship's auxiliary power generator motors, or use exhaust treatment technology. Because the SCAQMD significance thresholds would be exceeded for NO<sub>x</sub>, ROC, PM<sub>10</sub>, and SO<sub>x</sub> even after implementation of SES' control measures, the project's operational impact on air quality would be considered significant. 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.

The proposed project would comply with all applicable regulations in the 2003 Air Quality Management Plan (AQMP). The AQMP includes control measures that are intended to be implemented by federal and state governments to reduce emissions from ships and on-road trucks in order to bring the South Coast Air Basin (SCAB) into conformity with federal ambient air quality standards.

The FERC is required to conduct a conformity analysis for the Long Beach LNG Import Project to determine if the emissions associated with the project would conform to the State Implementation Plan (SIP) and would not reduce air quality in the SCAB. This draft EIS/EIR includes a draft conformity analysis; however, documentation supporting conformity with the applicable SIP and AQMP in accordance with Title 40 CFR Part 93.158 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 AQMP. The FERC staff recommends that SES complete a full air quality analysis and identify any mitigation requirements necessary for a finding of conformity and file this information with the FERC before the end of the draft EIS/EIR comment period for review and analysis in the final EIS/EIR.

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. Although the proposed project would not exceed cancer risk level significance thresholds established by the SCAQMD for toxic air pollutant health impacts, the SCAB and Port areas in particular are assumed, on the basis of the SCAQMD's Multiple Air Toxics Exposure Study in the SCAB, to suffer significant impacts related to toxic air pollutants and associated cancer risk levels. Therefore, toxic air pollutants resulting from the project would likely contribute to an existing cumulatively significant air quality impact in the SCAB.

## **Noise**

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.

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 ( $L_{dn}$ ) 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  $L_{dn}$  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.

### **Reliability and Safety**

The safety of both the proposed LNG import terminal facility and the related LNG vessel transit was evaluated. With respect to the onshore facility, the FERC staff completed a cryogenic design and technical review of the proposed terminal design and safety systems. As a result of the technical review of the information provided by SES in its application materials, a number of concerns were identified by the FERC staff relating to the reliability, operability, and safety of the facility. In response to staff's questions, SES provided written answers prior to a site visit and cryogenic design and technical review conference for the proposed project that was held in Long Beach in July 2004. Specific recommendations have been identified for outstanding issues that require resolution. Follow up on those items requiring additional action would need to be documented in reports to be filed with the FERC.

The FERC staff calculated thermal radiation distances for incident flux levels ranging from 1,600 to 10,000 Btu per square foot per hour ( $Btu/ft^2-hr$ ) for an LNG storage tank and trailer truck loading LNG storage tank fires. An incident flux level of 1,600  $Btu/ft^2-hr$  is considered hazardous for persons located outdoors and unprotected, a level of 3,000  $Btu/ft^2-hr$  is considered an acceptable level for wooden structures, and a level of 10,000  $Btu/ft^2-hr$  would cause clothing and wood to ignite and is considered sufficient to damage process equipment. It was determined that the exclusion zone distance for the 10,000  $Btu/ft^2-hr$  incident flux would not extend beyond the property line. The LNG storage tank thermal radiation exclusion zone distance for the 1,600 and 3,000  $Btu/ft^2-hr$  incident flux would extend outside the terminal site to the east onto Pier T property. For the trailer truck loading storage tank, the thermal radiation exclusion zone distance for the 1,600 and 3,000  $Btu/ft^2-hr$  incident flux also would extend outside the terminal site to the east onto Pier T property. 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 POLB owns the land surrounding the LNG terminal site but leases parcels to other tenants. In its application, SES stated that it is currently negotiating with the POLB and adjacent tenants for restrictive covenants to limit the use of the areas impacted. The FERC staff recommends that SES provide in its comments on the draft EIS/EIR, or in a separate document submitted at the same time, evidence of its ability to exercise legal control over the activities that occur within the portions of the thermal radiation exclusion zones that fall outside the terminal property line that can be built upon.

The FERC staff also conducted flammable vapor dispersion analyses and determined that design spills for the storage tanks, process area, and trailer truck loading area would not extend beyond the terminal property line.

Thermal radiation and flammable vapor hazard distances were also calculated for an accident or an attack on an LNG vessel. For 2.5-meter and 3-meter diameter holes in an LNG cargo tank, the FERC staff estimated distances to range from 4,372 to 4,867 feet for a thermal radiation level of 1,600 Btu/ft<sup>2</sup>-hr.

In addition to the analysis conducted by the FERC staff, the POLB commissioned a study by Quest Consultants, Inc. (Quest) to identify the worst-case hazards that would result from a release of LNG or other hydrocarbons in or near SES' proposed LNG import terminal. Using a detailed methodology, Quest identified potential accidental and intentional release events involving the LNG terminal and LNG ships. Quest's final report is titled *Hazards Analysis of a Proposed LNG Import Terminal in the Port of Long Beach, California* (POLB Quest Study) and is included in its entirety in Appendix F.

The POLB staff reviewed each of the release events identified by Quest using probability definitions developed by the Los Angeles County Fire Department (LACFD). Using the LACFD criteria, an event is considered possible if it could occur once every 100 to 10,000 years. Based on the chances of their occurrence, the release events that are considered possible per the LACFD criteria are a release from process equipment within the LNG terminal and a release from an LNG ship following a collision with the breakwater or with another ship outside the breakwater.

There are no residential, visitor-serving, or recreation populations and essentially no exposed Port workers within the thermal radiation exclusion zone for the 1,600 Btu/ft<sup>2</sup>-hr incident flux for a release from a rupture of process equipment at any location. Furthermore, the thermal radiation exclusion zone for the 10,000 Btu/ft<sup>2</sup>-hr incident flux for a release from a process equipment rupture would not impact the adjacent industrial facilities.

The analyses in the draft EIS/EIR and the POLB Quest Study have shown that based on the extensive operational experience of LNG shipping, the structural design of an LNG vessel, and the operational controls imposed by the ship's master, the Coast Guard, and local pilots, the likelihood of a cargo containment failure and subsequent LNG spill from a vessel casualty – collision, grounding, or allision – is very small.

Unlike accidental causes, historical experience provides little guidance in estimating the probability of a terrorist attack on an LNG vessel or onshore storage facility. For a new LNG import terminal proposal that would store a large volume of flammable fluid near populated areas, the perceived threat of a terrorist attack is a primary concern of the local population. However, the POLB Quest Study reported that the historical probability of a successful terrorist event would be less than seven chances in a million per year. In addition, the multi-tiered security system that would be in place for an LNG import facility in the POLB would reduce the probability of a successful terrorist event.

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 dock. The potential costs will not be known until the specific security needs have been identified, and the responsibilities of federal, state, and local agencies have been established in the Coast Guard's Waterway Suitability Assessment (WSA). 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. In addition, section 311 of the Energy Policy Act of 2005 stipulates that the FERC must require the LNG operator to develop an Emergency Response Plan that includes a Cost-Sharing Plan before any final approval to begin construction. The Cost-Sharing Plan shall include a description of any direct cost reimbursements to any state and local agencies with responsibility for security and safety at the LNG terminal and near vessels that serve the facility. To allow the FERC and the POLB the opportunity

to review the plan, the Agency Staffs will recommend to their respective Commissions that SES submit the plan concurrent with the submission of the Follow-on WSA.

### **Cumulative Impacts**

When the impacts of the Long Beach LNG Import Project are considered additively with the impacts of other past, present, or reasonably foreseeable future actions, there is some potential for cumulative effect on water resources, socioeconomics, land transportation, air quality, and noise. For the Long Beach LNG Import Project, control measures have been developed and additional mitigation measures have been recommended by the Agency Staffs to minimize or avoid adverse impacts on these resources. However, the cumulative projects represent additions of potentially significant and unavoidable emissions to the SCAB. In addition, 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 SCAB.

### **Growth-inducing Impacts**

The potential growth-inducing impacts of the Long Beach LNG Import Project would be an increase in development and population in the area associated with a new source of natural gas. Most of the natural gas that would be supplied by the LNG terminal would be transported into the SoCal Gas system and would be used to meet existing and future natural gas demand in the LA Basin. The demand for energy is a result of, rather than a precursor to, development in the region. Currently, imports from out of state represent approximately 87 percent of supply and are anticipated to rise to 88 percent by 2013, meaning that additional external supplies will be needed to keep up with demand. Given the short- and mid-term demand for natural gas and the need to reduce potential supply interruptions, the California Energy Commission has identified the need for California to develop new natural gas infrastructure to access a diversity of fuel supply sources and to remove constraints on the delivery of natural gas. The LNG that would be made available for vehicle fuel would be used to meet existing and projected future demand and provide a new source of fuel to facilitate conversion of diesel or gasoline-fueled vehicles to LNG, which could reduce air emissions in the area. Given the large local labor pool in Los Angeles and Orange Counties, no substantive influx of workers would occur during construction and operation of the Long Beach LNG Import Project.

### **ALTERNATIVES CONSIDERED**

The No Action or No Project Alternative was considered. While the No Action or No Project Alternative would eliminate the environmental impacts identified in this EIS/EIR, none of the objectives of the proposed project would be met. Specifically, SES would not be able to provide a new and stable supply of natural gas and LNG vehicle fuel to southern California. It is purely speculative to predict the actions that could be taken by other suppliers or users of natural gas and LNG in the region as well as the resulting effects of those actions. Because the demand for energy in southern California is predicted to increase, customers would likely have fewer and potentially more expensive options for obtaining natural gas and LNG supplies in the near future. This might lead to alternative proposals to develop natural gas delivery or storage infrastructure, increased conservation or reduced use of natural gas, and/or the use of other sources of energy.

It is possible that the infrastructure currently supplying natural gas and LNG to the proposed market area could be developed in other ways unforeseen at this point. This might include constructing or expanding regional pipelines as well as LNG import and storage systems. Any construction or expansion work would result in specific environmental impacts that could be less than, similar to, or greater than those associated with the Long Beach LNG Import Project. Increased costs could potentially result in

customers conserving or reducing use of natural gas. Although it is possible that additional conservation may have some effect on the demand for natural gas, conservation efforts are not expected to significantly reduce the long-term requirements for natural gas or effectively exert downward pressures on gas prices.

Denying SES' applications could force potential natural gas customers to seek regulatory approval to use other forms of energy. California regulators are promoting renewable energy programs to help reduce the demand for fossil fuels. While renewable energy programs can contribute as an energy source for electricity, they cannot at this time reliably replace the need for natural gas or provide sufficient energy to keep pace with demand.

Alternatives involving the use of other existing or proposed LNG or natural gas facilities to meet the stated objectives of the proposed project were evaluated. None of the pipeline system alternatives could provide a stable source of LNG for vehicle fuel or the storage of up to 320,000 cubic meters of LNG to address fluctuating energy supply and demand (two of the three stated objectives of the Long Beach LNG Import Project). Several of the proposed LNG import systems (either offshore California or in Mexico) could provide a new source of natural gas to southern California markets; however, none of these system alternatives could meet the proposed project's stated objective of providing a stable source of LNG for vehicle fuel. Furthermore, each of the system alternatives could result in its own set of significant environmental impacts that could be greater than those associated with the proposed project.

Alternative sites for an LNG import terminal were evaluated. The examination of alternative sites for an LNG import terminal involved a comprehensive, step-wise process that considered environmental, engineering, economic, safety, and regulatory factors. The alternative sites evaluated for an LNG terminal were not found to avoid or substantially lessen any significant environmental effects of the proposed project and/or could not meet all or most of the project objectives.

An evaluation of alternative routes for the natural gas and C<sub>2</sub> pipelines was also conducted. The alternatives were not found to avoid or substantially lessen impacts associated with the corresponding segment of the proposed routes and/or were infeasible due to the number of existing utilities already in place along the alignments and the lack of adequate space to install the facilities.

Reduced dredge/fill alternatives and alternative ship berth configurations, dredge disposal alternatives, and alternative dredging methods were evaluated to avoid or minimize impacts on water quality or biological resources associated with the in-water work needed for construction of the LNG ship berth and unloading facility and strengthening the shoreline structures. None of these alternatives were found to be feasible or would avoid or substantially lessen any significant environmental effects of the proposed project.

Vaporizer alternatives were also evaluated. The shell and tube vaporizer, which is the proposed vaporizer for the Long Beach LNG Import Project, was found to be efficient, readily able to be integrated with the NGL extraction system, and to utilize proven vaporizer technology. Shell and tube vaporizers are also the most compact LNG vaporizers available, an important consideration given the size of the LNG terminal site. New vaporization processes that primarily utilize air exchangers as a heat source were also evaluated because they would have lower fuel gas requirements than conventional combustion vaporizers. Reduced fuel use would lead to a corresponding reduction in air emissions and operating costs. The space requirements of these new vaporization processes, however, appear to make this approach technically infeasible at the proposed site.

## **ENVIRONMENTALLY PREFERABLE/SUPERIOR ALTERNATIVE**

The Agency Staffs will recommend to their respective Commissions that SES' proposed project is the environmentally preferable/superior alternative that can meet the project objectives.

TABLE ES-1

**Summary of Significant Environmental Impacts and Agency-Recommended Mitigation Measures**

Mitigation Number	Impact	Significance Before Mitigation <sup>a</sup>	Mitigation	Significance After Mitigation <sup>a</sup>
<b>TRANSPORTATION</b>				
Agency - Recommended Mitigation (ARM)1	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).	Significant (CEQA Class II)	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.	Less than significant (CEQA Class III)
<b>AIR QUALITY</b>				
ARM2	Total project construction emissions would exceed the South Coast Air Quality Management District (SCAQMD) significance thresholds for all criteria pollutants except sulfur oxides (SO <sub>x</sub> ) on a peak daily and quarterly basis even after the implementation of control measures (see section 4.9.4).	Significant (CEQA Class I)	<p>SES shall:</p> <ul style="list-style-type: none"> <li>• 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</li> <li>• use alternative-fuel buses to transport workers to and from the temporary laydown and worker parking area.</li> </ul> <p>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.</p>	Significant (CEQA Class I)

TABLE ES-1 (cont'd)

**Summary of Significant Environmental Impacts and Agency-Recommended Mitigation Measures**

Mitigation Number	Impact	Significance Before Mitigation <sup>a</sup>	Mitigation	Significance After Mitigation <sup>a</sup>
ARM3	The project's operational emissions would exceed the daily SCAQMD significance thresholds for nitrogen oxides (NO <sub>x</sub> ), reactive organic compounds (ROC), particulate matter having an aerodynamic diameter of 10 microns or less (PM <sub>10</sub> ), and SO <sub>x</sub> . 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 PM <sub>10</sub> and particulate matter having an aerodynamic diameter of 2.5 microns or less (PM <sub>2.5</sub> ) even after implementation of all of SES' proposed control measures. Consequently, the project's impact would be considered significant for ozone (NO <sub>x</sub> and ROC), PM <sub>10</sub> , PM <sub>2.5</sub> , and SO <sub>x</sub> . The project's impact would not be considered significant for carbon monoxide (see section 4.9.5).	Significant (CEQA Class I)	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.	Significant (CEQA Class I)
ARM4	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 ( <i>de minimis</i> ) of the pollutant(s) for 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).	Significant (CEQA Class I)	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.	Less than significant (CEQA Class III)
<b>RELIABILITY AND SAFETY</b>				
ARM5	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.	Significant (CEQA Class II)	SES shall provide in its comments on the draft EIS/EIR, or in a separate document submitted at the same time, evidence of its ability to exercise legal control over the activities that occur within the portions of the thermal radiation exclusion zones that fall outside the site property line that can be built upon.	Less than significant (CEQA Class III)

TABLE ES-1 (cont'd)

**Summary of Significant Environmental Impacts and Agency-Recommended Mitigation Measures**

Mitigation Number	Impact	Significance Before Mitigation <sup>a</sup>	Mitigation	Significance After Mitigation <sup>a</sup>
ARM6	<p>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).</p> <p>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).</p>	Significant (CEQA Class II)	<p>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 each recommendation below. This information shall be submitted a minimum of 30 days before approval to proceed is required.</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Prior to initial site preparation, SES shall file a technical review of its facility design that: <ul style="list-style-type: none"> <li>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</li> <li>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.</li> </ul> </li> <li>• 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</li> </ul>	Less than significant (CEQA Class III)

TABLE ES-1 (cont'd)

**Summary of Significant Environmental Impacts and Agency-Recommended Mitigation Measures**

Mitigation Number	Impact	Significance Before Mitigation <sup>a</sup>	Mitigation	Significance After Mitigation <sup>a</sup>
			<p>covered, and automatic and manual remote signals initiating discharge of the units. Plan drawings shall clearly show the planned location of all fixed and wheeled extinguishers.</p> <ul style="list-style-type: none"> <li>• The final design of the hazard detection equipment shall identify manufacturer and model.</li> <li>• 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.</li> <li>• 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.</li> <li>• The final design of the fixed and wheeled dry-chemical, fire extinguishing, and high expansion foam hazard control equipment shall identify manufacturer and model.</li> <li>• 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.</li> <li>• The final design shall include a minimum of three onsite seismic instruments that would have the capability of actuating an automatic plant-wide emergency shutdown in the event of seismic activity approaching the site Contingency Level Earthquake. SES shall specify the set point to be used.</li> <li>• In the final design all structures, besides the LNG storage tanks, shall be designed to withstand the effects of an Operating Basis Earthquake, as 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.</li> <li>• The final design shall include details of the LNG tank tilt settlement and differential settlement limits between each LNG tank and piping and</li> </ul>	

TABLE ES-1 (cont'd)

**Summary of Significant Environmental Impacts and Agency-Recommended Mitigation Measures**

Mitigation Number	Impact	Significance Before Mitigation <sup>a</sup>	Mitigation	Significance After Mitigation <sup>a</sup>
			<p>procedures to be implemented in the event that limits are exceeded.</p> <ul style="list-style-type: none"> <li>• The final design shall include drawings and specifications of the piping support structure of the LNG storage tanks.</li> <li>• 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.</li> <li>• The final design shall include detection instrumentation and shutdown procedures for vaporizer tube leak, shell side overpressure, or bursting disc failure.</li> <li>• The final design shall include provisions to drain the fractionation systems to safe locations.</li> <li>• 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 continuously monitor for the presence of a flammable fluid; would alarm the hazardous condition; and would shut down the appropriate systems.</li> <li>• The final design shall include a fire protection evaluation carried out in accordance with the requirements of NFPA 59A, Chapter 9.1.2.</li> <li>• The final design shall include details of the shutdown logic, including cause and effect lists for alarm and shut down.</li> <li>• 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.</li> <li>• The final design shall include procedures for offsite contractors' responsibilities, restrictions, limitations, and supervision of the contractors by SES staff.</li> <li>• Security personnel requirements prior to and</li> </ul>	

TABLE ES-1 (cont'd)

**Summary of Significant Environmental Impacts and Agency-Recommended Mitigation Measures**

Mitigation Number	Impact	Significance Before Mitigation <sup>a</sup>	Mitigation	Significance After Mitigation <sup>a</sup>
			<p>during LNG vessel unloading shall be filed prior to commissioning.</p> <ul style="list-style-type: none"> <li>• An operation and maintenance manual and safety procedure manual shall be filed prior to commissioning.</li> <li>• 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.</li> <li>• The contingency plan for failure of the outer LNG tank containment shall be filed prior to commissioning.</li> <li>• The final detailed drawings of the transfer line impoundment systems, including cross sections, shall be filed prior to commissioning.</li> <li>• 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.</li> <li>• 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.</li> <li>• 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.</li> </ul> <p>The following measures shall apply throughout the life of the facility:</p> <ul style="list-style-type: none"> <li>• 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</li> </ul>	

TABLE ES-1 (cont'd)

**Summary of Significant Environmental Impacts and Agency-Recommended Mitigation Measures**

Mitigation Number	Impact	Significance Before Mitigation <sup>a</sup>	Mitigation	Significance After Mitigation <sup>a</sup>
			<p>provision of other pertinent information not included in the semi-annual reports described below, including facility events that have taken place since the previously submitted annual report, shall be submitted.</p> <ul style="list-style-type: none"> <li>• 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, non-scheduled 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 boilloff 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 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.</li> <li>• 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,</li> </ul>	

TABLE ES-1 (cont'd)

**Summary of Significant Environmental Impacts and Agency-Recommended Mitigation Measures**

Mitigation Number	Impact	Significance Before Mitigation <sup>a</sup>	Mitigation	Significance After Mitigation <sup>a</sup>
			<p>the Commission shall be notified within 24 hours and procedures for corrective action shall be specified.</p> <ul style="list-style-type: none"> <li>• Significant non-scheduled events, including safety-related incidents (i.e., LNG or natural gas releases, fires, explosions, mechanical failures, unusual over pressurization, and major injuries) and security-related incidents (i.e., attempts to enter site, suspicious activities) shall be reported to the FERC staff and the Coast Guard within 24 hours. In the event an abnormality is of significant magnitude to threaten public or employee safety, cause significant property damage, or interrupt service, notification shall be made immediately, without unduly interfering with any necessary or appropriate emergency repair, alarm, or other emergency procedure. This notification practice shall be incorporated into the LNG facility's emergency plan. Examples of reportable LNG-related incidents include:               <ol style="list-style-type: none"> <li>a. fire;</li> <li>b. explosion;</li> <li>c. estimated property damage of \$50,000 or more;</li> <li>d. death or personal injury resulting in patient hospitalization;</li> <li>e. free flow of LNG for 5 minutes or more that results in pooling;</li> <li>f. unintended movement or abnormal loading by environmental causes, such as an earthquake, landslide, or flood, that impairs the serviceability, structural integrity, or reliability of an LNG facility that contains, controls, or processes gas or LNG;</li> <li>g. 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;</li> <li>h. any malfunction or operating error that causes the pressure of a pipeline or LNG facility that contains or processes gas or LNG to rise above its maximum allowable</li> </ol> </li> </ul>	

TABLE ES-1 (cont'd)

**Summary of Significant Environmental Impacts and Agency-Recommended Mitigation Measures**

Mitigation Number	Impact	Significance Before Mitigation <sup>a</sup>	Mitigation	Significance After Mitigation <sup>a</sup>
ARM7	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).	Significant (CEQA Class II)	<p>operating pressure (or working pressure for LNG facilities) plus the build-up allowed for operation of pressure limiting or control devices;</p> <ul style="list-style-type: none"> <li>i. a leak in an LNG facility that contains or processes gas or LNG that constitutes an emergency;</li> <li>j. inner tank leakage, ineffective insulation, or frost heave that impairs the structural integrity of an LNG storage tank;</li> <li>k. 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;</li> <li>l. safety-related incidents to LNG vessels occurring at or en route to and from the LNG facility; or</li> <li>m. an event that is significant in the judgment of 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.</li> </ul> <p>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. 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.</p> <p>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</p>	Less than significant (CEQA Class III)

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TABLE ES-1 (cont'd)

## Summary of Significant Environmental Impacts and Agency-Recommended Mitigation Measures

Mitigation Number	Impact	Significance Before Mitigation <sup>a</sup>	Mitigation	Significance After Mitigation <sup>a</sup>
ARM8	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)..	Significant (CEQA Class II)	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.	Less than significant (CEQA Class III)
ARM9	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).	Significant (CEQA Class II)	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.	Less than significant (CEQA Class III)
ARM10	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).	Significant (CEQA Class II)	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.	Less than significant (CEQA Class III)
ARM11 ARM12	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).	Significant (CEQA Class II)	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: <ul style="list-style-type: none"> <li>designated contacts with state and local emergency response agencies;</li> <li>scalable procedures for the prompt notification of appropriate local officials and emergency response agencies based on the level and</li> </ul>	Less than significant (CEQA Class III)

TABLE ES-1 (cont'd)

**Summary of Significant Environmental Impacts and Agency-Recommended Mitigation Measures**

Mitigation Number	Impact	Significance Before Mitigation <sup>a</sup>	Mitigation	Significance After Mitigation <sup>a</sup>
			severity of potential incidents; <ul style="list-style-type: none"> <li>• procedures for notifying residents, employees, and recreational users within areas of potential hazard;</li> <li>• locations of permanent sirens and other warning devices; and</li> <li>• an "emergency coordinator" on each LNG vessel to activate sirens and other warning devices.</li> </ul> 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.	

<sup>a</sup> California Environmental Quality Act Significance Classifications:  
 Class I - a significant impact that cannot be mitigated to non-significance.  
 Class II - a significant impact, but one that can be mitigated to non-significance with the application of appropriate mitigation measures.  
 Class III - a non-significant impact.  
 Class IV - a beneficial impact.