5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 SUMMARY OF THE STAFF'S ENVIRONMENTAL ANALYSIS

The conclusions presented are those of the environmental staff of the FERC. The Coast Guard will present, in its LOR and LNG Operations Plan, its own conclusions and recommendations, prior to construction and operation. The LOR will address the suitability of the Sabine/Neches Waterway for LNG ship transportation, and the Coast Guard's LNG Operations Plan will address issues related to the public impact of safety or security zones for LNG vessels. Likewise, the COE will present its own conclusions and recommendations in the dredging and wetland permits it may issue pursuant to section 10 of the River and Harbors Act and section 404 of the CWA. The EPA has the authority to review and veto the COE decisions on the section 404 permits.

We have determined that construction and operation of the Port Arthur LNG Project would result in limited adverse environmental impacts. Our conclusion is based on information provided by Sempra and data developed from data requests; field investigations by Commission staff; literature research; alternatives analysis; comments from federal, state, and local agencies; and input from public groups and individual citizens.

As part of our review, we developed measures that we believe would appropriately and reasonably avoid, minimize, or mitigate for environmental impacts resulting from construction and operation of the proposed Project. We are, therefore, recommending that our mitigation measures be attached as conditions to any authorization issued by the Commission.

If the Coast Guard issues a LOR finding the waterway suitable for LNG marine traffic, the arrival, transit, cargo transfer, and departure of LNG ships in the Sabine/Neches Waterway would be required to adhere to the procedures of a *Liquefied Natural Gas Vessel Management and Emergency Plan* to be developed by the Coast Guard. In addition, Sempra would develop Operations and Emergency Manuals in consultation with the Coast Guard. These procedures would be developed to ensure the safety and security of all operations associated with LNG ship transit and unloading.

The discussion below summarizes the environmental impacts and the proposed or recommended mitigation for each resource analyzed in this final EIS.

5.1.1 Nonjurisdictional Facilities

Nonjurisdictional facilities associated with the Project would include two 230-kilovolt (kV) electrical transmission lines, one approximately 18.7 miles long (from Sabine Station) and one approximately 7.2 miles long (from Point Acres Bulk Substation), and a new substation to provide power for the LNG terminal. We have included an environmental analysis in **appendix A** of the potential transmission line routes identified by Entergy, based on the information made available to us by the applicant. Entergy would be responsible for obtaining other permits and approvals for the electrical facilities, including those required under the CWA, CZMA, ESA, and NHPA. We have recommended that Sempra file comments from the SHPO and FWS prior to receiving service from these facilities.

In addition, SH 87, various existing pipelines, and utilities would need to be relocated if the proposed LNG terminal is constructed. We have included an environmental analysis of the relocation project in **appendix A**.

5.1.2 Geology

Construction and operation of the proposed Port Arthur LNG Project would have minimal impact on geologic resources. There is at least one known plugged and abandoned oil well on the proposed LNG terminal site and other wells in the vicinity of proposed project work spaces. We have recommended that Sempra develop a plan for construction in the vicinity of known abandoned wells on the terminal site and for any unidentified wells that could be discovered during construction (see section 4.1.2). Sempra's protocol for foreign pipeline crossings requires that installation of the proposed pipeline would not adversely affect adjacent pipelines or other utilities encountered along the pipeline route.

The terminal and pipeline would lie in an area of low seismic risk. Site-specific analysis conducted for the LNG terminal site revealed that due to the very low ground motions predicted at the site and the lack of observed surface faulting, earthquake hazards were not considered a controlling factor in facility design. Similarly, for the pipeline facilities, the combination of the low risk of seismic activity in the region, absence of significant faulting, and pipeline construction materials that have tolerances for moderate ground movement would result in a minimal overall hazard associated with seismicity and faulting.

Due to the presence of saturated sediments beneath the LNG terminal site, structures constructed at the site could be susceptible to liquefaction under sufficiently strong ground motion. However, because of the relatively low levels of seismic activity and possible ground motion predicted for the site, the presence of necessary liquefaction criteria would be limited and the risk of soil liquefaction at the site is minimal. No significant risk of soil liquefaction is anticipated for the pipeline facilities.

Subsidence is a likely occurrence in the general vicinity of the proposed LNG terminal site and along the proposed pipeline routes due to sediment compaction, oil and gas extraction, and groundwater pumping throughout the Gulf Coast region. Although Sempra's geotechnical investigations at the terminal location indicate that subsurface conditions at the site are generally suitable for the facilities, they have accounted for the possibility of subsidence in their facility design. Foundations and other critical facilities would be monitored to ensure that they remain within acceptable limits and deep-driven pile-supported foundations would protect equipment and interconnecting piping from differential movements. Periodic monitoring along the pipeline rights-of-way during operation would ensure that the integrity of the pipelines is not compromised by movement related to subsidence.

Under significant weather events, the LNG terminal facilities would be subjected to severe flooding, storm surges, high winds, erosion along the shoreline and docking facilities, and potential site access interruptions. Because the structural and mechanical elements have been designed into the LNG terminal facilities to withstand coastal flooding and storms, flooding due to storm events is not expected to adversely affect the Project. Sempra proposes to control erosion of the terminal marine berth shoreline with rip-rap and other slope stabilization techniques.

5.1.3 Soils and Sediments

Construction of the proposed LNG facility and proposed send-out pipelines would affect soils, including hydric and prime farmland soils. Since the LNG terminal site and proposed pipeline rights-of way are currently well vegetated and are nearly level, the potential for erosion of soils and discharge of sediments off the site is considered to be relatively low during construction. Sempra would minimize impacts by implementing the mitigative measures specified in our Plan and Procedures. Further, Sempra would minimize potential soil contamination by implementing the preventative and mitigative measures specified in its SPCC Plan. With the proposed construction procedures, as well as the compaction

minimization measures contained in the Plan and Procedures, impacts due to soil compaction would be minimized to the extent possible.

Our analysis indicates that potential hazards associated with soft sediments, ground subsidence, and hydric soils underlying areas that would be developed by Sempra for the LNG terminal would be adequately addressed with its engineering design. Due to the relatively shallow construction depth of the pipelines, we conclude that the pipelines would not have an effect on deep sediment loading or stability.

None of the soils on the LNG terminal site and along the pipeline routes are predicted to have a low revegetation potential following construction. Approximately, 0.98 acre of prime farmland soils would be taken out of production for the life of the project within the fenced and graveled MLV or pig receiver sites at MPs 29.9, 40.3, 50.0, and 69.9. Sempra would adhere to the measures outlined in our Plan and Procedures, including the topsoil segregation requirements specified by our Plan and individual landowners, which would minimize effects on soils due to construction of the Project.

5.1.4 Water Resources

5.1.4.1 Groundwater

Construction and operation of the proposed Project would not have a significant impact on groundwater resources in the Project area, including the underlying Chicot Aquifer. No wellhead protection areas would be crossed by either of the proposed pipeline routes. Sempra has identified one water supply well that would be located within the construction right-of-way along the 70-Mile-Long Pipeline at MP 46.8. Sempra has proposed mitigation that would protect this well from accidental damage or spills of hazardous liquids. Sempra would conduct and document pre- and post-construction well water quality and yield testing of wells and springs found within 150 feet of the temporary construction right-of-way and extra work spaces. In the event that a water supply well or spring is damaged as a result of the Project, Sempra would provide a temporary source of water to the affected party(s) and repair or compensate the owner for damages. With the implementation of these measures, construction and operation of the Project is not expected to result in adverse impacts to water supply wells.

The greatest potential for impact on groundwater would be from spills, leaks, or other releases of hazardous substances during Project construction or operation. Sempra has developed a SPCC Plan for the Project that conforms to the guidelines in section IV.A of our Procedures. A preliminary version of Sempra's SPCC Plan is provided in **appendix D**. We believe that there would be no impacts to groundwater resources as a result of construction and operation of the Project.

5.1.4.2 Surface Water

The proposed LNG terminal site and associated 3-mile-long pipeline would be located within the Sabine River watershed. The 70-Mile-Long Pipeline would extend across the Sabine River, Lower Calcasieu, and West Fork Calcasieu watersheds. No wild or scenic rivers would be affected by Project facilities. No surface waterbodies known to contain contaminated sediments would be crossed or affected by the Project. The Houston River Water Works, District 11, potable water intake is approximately 1.6 miles downstream of the 70-Mile-Long Pipeline crossing of the Houston River Canal (MP 52.9). Sempra would install this crossing using the HDD technique avoiding disturbance of the water column. The Project should have no effect on the intake.

The primary impact on surface waters from construction of the LNG terminal would be the dredging adjacent to the Port Arthur Ship Canal to accommodate the slip and turning basin. Sempra indicates that the dispersion rates of suspended sediments in the ship channel are expected to have minimal impact due

to the proposed dredging technique and type of material being excavated. Sempra proposes to remove the dredged material using a hydraulic dredge, and transfer it via floating and submerged pipe to a Sempra-owned DMPA (DMPA 1-2). Construction of the slip and turning basin would require the dredging of approximately 6.7 million yd^3 of material.

Sempra conducted preliminary soil and sediment sampling at the LNG site and in the ship channel. The initial analyses indicate that the material would be suitable for beneficial reuse projects. Sempra has committed to conduct any additional testing required by the regulatory permitting authorities as well as the ultimate recipient of the material to determine its suitability.

The proposed pipelines would cross 84 waterbodies, including 37 perennial streams, 2 lakes, 3 ponds, and 42 intermittent streams. Of these, 16 are classified as major waterbody crossings (greater than 100 feet wide). To minimize construction impacts on surface waters, Sempra would develop and implement the measures described in a project-specific SWPPP, the Plan and Procedures, as well as the requirements in the permits issued by the other federal and state agencies.

The 70-Mile-Long Pipeline route would cross two waterbodies listed as Louisiana Natural and Scenic Rivers (Beckwith Creek and the Hickory Branch of the Calcasieu River) at MPs 62.6 and 63.7, respectively. The 70-Mile-Long Pipeline route also would cross the GIWW, a waterbody considered sensitive by federal and state resource management agencies, as it is a navigable waterbody regulated by the COE. Sempra would cross each of these waterbodies using the HDD technique; therefore, no banks or vegetation would be disturbed if the HDDs are successful, and the natural and scenic or functional nature of these waterbodies would remain intact. Additionally, Sempra identified two waterbodies in Louisiana that do not meet water quality standards associated with their designated uses; however, both are listed as impaired due to turbidity, not contaminants.

Sempra proposes to use a total of 14 HDDs to cross all or parts of several waterbodies. To ensure that the site-specific major waterbody and HDD plans address potential issues associated with sedimentation or erosion into nearby wetlands and waterbodies, and that contingency plans are in place in the event of HDD failure, we have recommended that Sempra provide a site-specific crossing plan for each waterbody that would be used if the planned HDD is unsuccessful. For water-to-water and water-to-land HDDs in Sabine Lake, Sempra proposes to allow released drilling fluids to pool in the trench. However, Sempra has not identified how it would minimize the release of drilling fluids at the HDD exist holes in Sabine Lake. Since this is a shallow lake, the quantity of drilling fluids released into the lake from the HDD exist holes could be significant. Sempra has indicated that it would minimize the release of drilling fluid at the HDD exit hole in the lake using best management practices, such as drawing back as much of the drilling mud as possible and altering the composition weight of the drilling mud. Sempra's turbidity plume modeling indicates the likely duration of the plumes would be approximately 60 hours.

Operational impacts associated with the LNG terminal would include resuspension of bottom sediments as a result of periodic maintenance dredging and incidental propeller wash from LNG ships, and creation of additional impervious surfaces at the facility. A maintenance dredging placement plan would have to be submitted and approved by the COE and the state before implementation. Dredging and incidental propeller wash would temporarily increase turbidity in localized areas. Turbidity from propeller wash would be minor and short term and would decrease as the berthings of LNG ships at the facility become routine. Turbidity caused by maintenance dredging would be short-term and localized. Operation of aboveground facilities associated with the proposed pipelines is not expected to affect water resources.

As with other large cargo ships, LNG carriers would take on some ballast water to maintain stability and trim as they off-load their cargo, but they would not be fully loaded when departing the Port Arthur Terminal. The amount of ballast water required by each LNG carrier would vary according to its size and

the weather conditions. Ballast water intakes could also entrain and/or impinge juvenile fish, fish larvae, and eggs. Since ballast water would not be released into the Sabine/Neches Waterway there is little chance for the introduction of invasive species through the release of ballast water. In addition to ballast water, LNG carriers (as with other large ships) would intake and discharge some water for cooling during operations in the Sabine/Neches Waterway.

5.1.5 Wetlands

The proposed Project would be constructed in areas that support extensive wetlands, including estuarine, palustrine, and lacustrine wetlands. Construction of the Project would affect a total of about 390.8 acres of wetlands, including the permanent loss of 82.5 acres of wetlands at the LNG terminal site and 0.04 acre of wetlands at the MLV sites at MPs 19.2 and 29.9. Of the approximately 308.3 acres of wetlands that would be temporarily affected by construction along the pipeline routes, 13.1 acres would be permanently converted from forested wetlands to emergent wetlands.

To minimize impacts on wetlands at the LNG terminal site, Sempra would implement the requirements in our Procedures. For the pipeline portion of the Project, Sempra would implement our Procedures, as modified based on any authorized variances associated with wetland crossings. We recommend that Sempra use a 100-foot-wide construction right-of-way in wetlands between MPs 1.0 and 1.2 and MPs 19.2 and 35.4 because the push-pull technique would be used. We recommend use of an 110-foot-wide right-of-way between MPs 0.0 and 1.0 because both pipelines would be within the same right-of-way in this segment. For all other wetlands Sempra would use a 75-foot-wide construction right-of-way, as specified in the Procedures. Sempra has not provided a complete, agency-approved, finalized Aquatic Resources Mitigation Plan; we have also recommended that this be filed prior to the start of any construction.

5.1.6 Vegetation

Approximately 198.2 acres of land would be converted for operation of the LNG terminal, including 82 acres of vegetated areas that would be converted permanently to open water for the slip and turning basin. Construction of the proposed pipelines and associated aboveground facilities would involve the temporary clearing of about 773.5 acres of vegetated areas. Approximately 3.22 acres of land would be graveled and permanently maintained devoid of vegetation at the pig launcher/receiver and MLV sites. Upon completion of construction, approximately 74.1 acres of upland forest and 13.1 acres of forested wetlands would be maintained permanently in an herbaceous state.

Following construction, all temporary workspace would be restored or allowed to re-vegetate naturally to pre-construction conditions. Pre- and post-construction measures would be implemented to ensure successful revegetation of these areas.

5.1.7 Wildlife and Aquatic Resources

5.1.7.1 Wildlife

The impact of construction and operation of the proposed Project on wildlife would be the temporary alteration and permanent loss of habitat. Other impacts to wildlife resources resulting from the construction and operation of the Port Arthur LNG Project are expected to be minimal.

Initial clearing and construction activities would result in the disruption of approximately 1,497 acres of wildlife habitat comprising open water; emergent marsh; coastal grasslands/prairie; coastal

woodland/upland forest; forested, shrub/scrub, and emergent wetlands; and developed or previously disturbed land. Other than a permanent loss of habitat at the LNG terminal site, we do not expect wildlife to be impacted by the operation of the LNG terminal. Once construction is completed, wildlife can re-occupy available habitat at the LNG terminal site.

The areas disturbed by construction, excluding areas with aboveground facilities, would be revegetated after construction has been completed. Wildlife populations that utilize areas converted for the permanent pipeline rights-of-way would not be affected. Although temporary and permanent impacts on food, cover, and water sources may occur, none of the species identified within the Project area are specialized in such a way that construction of a pipeline would inhibit the overall fitness or reproductive viability of the populations as a whole. Many of the mammal, bird, reptile, and amphibian species are adaptive to changing habitat conditions and have the capability of temporarily expanding or shifting their home ranges to find alternative sources of food, water, and shelter until the right-of-way habitats become re-established.

The LNG terminal site is at the western edge of the Mississippi flyway and the eastern edge of the Central flyway for migratory birds. Construction of the LNG terminal could cause potential injury or mortality of migrating birds that may strike the LNG terminal facilities. The electrical supply system that would be constructed and operated by Entergy would require installation of approximately 26 miles of 230-kV electrical transmission lines, which could result in some avian mortality. The lines would be constructed according to industry standards or the Avian Power Line Interaction Committee guidelines, reducing the likelihood of bird strikes and avian mortality. Structures at the LNG terminal site, such as LNG offloading infrastructure and LNG storage tanks, might cause some avian mortality due to bird strikes. However, the overall numbers are expected to be low. The storage tank design would reduce the likelihood of bird strikes because no reflective materials would be used and there would be no extensive lighting of the tanks, thus avoiding the two major sources of bird strikes on man-made structures. Sempra plans to use sodium vapor lights shielded to direct the light a specific areas, rather than broadcast over general areas. However, since Sempra has not provided a lighting plan for the terminal, we have recommended that Sempra provide a lighting design plan to minimize impact on the bird population. Sempra also plans to train personnel on the issue of bird strike mortality and, through periodic environmental training and posted flyers, remind staff to be observant for dead birds at or adjacent to buildings and structures.

The majority of the Project area consists of emergent marsh and coastal prairie/grasslands that provide habitat for wintering waterfowl and rookeries. Sempra has agreed to conduct an overview of the Round Lake area rookery 30 days prior to commencement of construction, and has committed to avoid construction activities within 1,000 feet of the Round Lake area rookery, if it is active, between February 15 and September 1. Given the abundant adjacent areas that can provide alternative habitat, we conclude that there would be no significant impact on migratory waterfowl.

5.1.7.2 Aquatic Resources

The proposed LNG terminal site would be south of Sabine Lake on the Port Arthur Ship Canal. Despite on-going maintenance dredging and ship traffic, the Port Arthur Ship Canal supports a wide variety of shellfish and finfish species. The pipelines would cross 84 waterbodies. Potential impacts to aquatic resources from Project construction and operation include those associated with filling of wetlands for the LNG terminal facilities, dredging of the berth area, and pipeline construction across waterbodies and through wetlands, including EFH waters and wetlands.

Given the existing water quality conditions with relatively high suspended sediment concentrations, dredging and pipe laying would not be expected to noticeably increase turbidity for significant lengths of

time in the already turbid waters of the Port Arthur Ship Canal and Sabine Lake. Overall impacts to the fishery resources in the Project area generally would be minimal and short-term. The fish and benthic organisms of the area would be impacted slightly during the construction phase, but recruitment and re-colonization would replenish the species. In addition to the loss/alteration of aquatic habitats, the primary impacts to fishes associated with dredging include entrainment of organisms by dredging machinery and increased turbidity due to the re-suspension of bottom sediments. Incidental take of benthic organisms due to entrainment during the dredging of the slip and turning basin would be expected, but would not be extensive enough to have a significant impact on the fishery resources of the area. Ballast water intakes could also entrain and/or impinge juvenile fish, fish larvae, and eggs. Since ballast water would not be released into the Sabine/Neches Waterway there is little chance for the introduction of invasive species through the release of ballast water.

Other potential effects of construction include temporary interruption of fish and invertebrate movement either during developmental changes or during foraging. Construction may cause temporary emigration of fish populations from the immediate construction area in order to avoid areas of elevated suspended sediments. However, it is unlikely that relocation or disrupted migration would significantly affect fish populations because construction activities would be short term and localized at any given location.

Direct spills of petroleum or other toxic products into waterbodies during construction and facility operation could be harmful to aquatic organisms, depending on the type, quantity, and concentration of the spill. To reduce the potential for direct surface water contamination, Sempra would implement the procedures in its SPCC Plan, including restrictions on refueling equipment and storing fuel and other potentially toxic materials at least 100 feet from waterbodies during construction.

Sempra plans to place the dredged material in DMPA 1-2, with some potentially being put to subsequent beneficial use. Approximately 583 acres of wetlands would be filled with dredged material at DMPA 1-2, but Sempra would replace all 583 acres in place, in kind.

Post-construction and operational impacts would be minimal and primarily associated with periodic maintenance dredging in the slip and turning basin area. The increased ship traffic would represent a small incremental increase in the total annual vessel traffic in the Project area and is not expected to result in a measurable increase in aquatic impacts.

Impacts on fisheries resources resulting from pipeline construction activities at waterbody crossings can include sedimentation and turbidity, alteration or removal of instream and stream bank fish cover, introduction of water pollutants, or entrainment of small organisms during hydrostatic testing. Studies generally have indicated that pipeline construction through waterbodies results in temporary impacts on streams and rivers, and that there are no long-term effects on water temperature, pH, dissolved oxygen, benthic invertebrate populations, or fish populations.

Post-construction or operational impacts of the pipelines would be minimal. Restoration of the vegetation along the pipeline construction work areas would minimize erosion potential relative to waterbodies. Minimal impact on fisheries is expected from maintenance mowing or manual removal of woody vegetation in the vicinity of the pipeline rights-of-way as maintenance would be in accordance with our Procedures.

5.1.7.3 Essential Fish Habitat

Construction of the proposed Project is not expected to have a significant impact on EFH. Impacts on EFH from the construction of the proposed Project can be divided into two general categories: those associated with loss or alteration of habitat and those associated with dredging activities. These impacts

can be further divided into those that result in temporary or permanent effects on EFH and species. The primary impact of construction and operation of the Project facilities would be the alteration and direct loss of habitat types that could function as EFH for the various species.

NOAA Fisheries has identified aquatic and tidally influenced wetland habitats in the Project area as designated EFH for postlarval, juvenile, and subadult life stages of two species of shellfish (brown and white shrimp) and three species of finfish (red drum, Spanish mackerel, and bonnethead shark). Potential for EFH at the LNG terminal site includes the open water of the Port Arthur Ship Canal. Potential for EFH along the pipelines includes estuarine wetlands and open waters that are outside of existing levees and not in previously impacted upland areas. EFH habitat potentially exists in Keith Lake, the Keith Lake Cut, Sabine Lake, and waterbodies connecting to Sabine Lake along the rights-of-way.

A total of 82 acres of deep water habitat would be created by dredging for the slip and turning basin, which would primarily entail conversion of land to a new open water area. Approximately 38.3 acres of open water EFH would be temporarily disturbed by the deepening of the turning basin in the Port Arthur Ship Canal. Materials dredged from these areas would be deposited in an approved DMPA, and eventually could be put to beneficial re-use. Maintenance dredging is anticipated to be required no more than every 6 to 7 years. Dredged materials would be deposited in accordance with permits issued by the COE and the state at DMPA 1-2 or another approved DMPA, and some of it may be put to beneficial use at the J. D. Murphree WMA. The amount of dredging would be much less than that which is periodically performed to maintain the Port Arthur Ship Canal. Therefore, impacts on EFH resulting from Project maintenance dredging would represent a minor increase over those occurring during COE dredging of the federal navigation channels in the Project vicinity.

We estimate that installation of the pipelines would temporarily affect approximately 455.7 acres of EFH, which includes both open water and wetland EFH. NOAA Fisheries has commented that impacts on wetlands that provide EFH should be minimized and recommends the use of best management construction and restoration practices, including repairing of banks; restricting the number and limits of airboat and tracked equipment passage over marshes; backfilling the pipeline ditch to marsh elevation; replanting marsh vegetation on all impacted areas if the wetland is not revegetated within 1 year; documenting the need for compensatory wetland mitigation through ground and aerial (low altitude infrared photography) prior to and immediately after construction; and completing additional surveys within one complete growing season after construction, if needed. Operation of the pipeline facilities should have minimal impacts on EFH since the pipeline would be buried and the existing EFH would become reestablished, or would be actively revegetated by Sempra, within the construction corridors.

Sempra has committed to mitigating unavoidable wetland impacts resulting from construction and operation of the Project. We have recommended that Sempra finalize an Aquatic Resources Mitigation Plan in consultation and coordination with the appropriate federal and state agencies. The finalized Aquatic Resources Mitigation Plan should also incorporate NOAA Fisheries' comments regarding use of certain best management practices during construction and documenting the need for compensatory EFH and wetland mitigation through ground and aerial surveys.

5.1.8 Threatened and Endangered Species

Based on the presence of habitat and historical records of occurrence, 22 federal and/or state listed endangered and threatened species were identified as potentially occurring within the Project area. These include: seven reptile species (hawksbill sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, green sea turtle, loggerhead sea turtle, alligator snapping turtle, and American alligator); seven marine mammals (sperm whale, blue whale, sei whale, fin whale, humpback whale, north Atlantic right whale, and West

Indian manatee); and eight bird species (bald eagle, brown pelican, piping plover, red-cockaded woodpecker, reddish egret, white-faced ibis, swallow-tailed kite, and arctic peregrine falcon).

With the exception of the brown pelican that is known to forage, roost, and/or loaf in the Project area, there is a low probability of these species occurring in the vicinity of the proposed Project and the Project is not likely to adversely affect any of these species or their critical habitat. No brown pelican rookeries are located in the vicinity of the Project and because the brown pelican is a highly mobile species and there is other available habitat in the area, the Project is not likely to adversely affect the brown pelican. Suitable red-cockaded woodpecker habitat has been identified along the 70-Mile-Long Pipeline in Beauregard Parish and surveys were conducted in the suitable habitat in 2003 and 2005. No red-cockaded woodpeckers, cavity trees, or other signs of red-cockaded woodpecker activity were observed during those surveys. The FWS has concurred with the determination that the proposed project is not likely to adversely affect the red-cockaded woodpecker. The FWS has stated that no further consultation will be required for this project unless there are changes in the scope or location of the work, or construction has not been initiated within 1 year. Since the work on this section of the pipeline would not be initiated within 1 year, follow-up consultation would be required with the FWS prior to construction.

5.1.9 Land Use, Recreation, and Visual Resources

The LNG terminal facilities and marine basin would be located on property formerly used by the COE for dredge spoil placement. Existing land uses on the site include a mixture of open land and undeveloped industrial land. Land use impacts associated with the construction (263.2 acres) and operation (198.2 acres) of the LNG terminal primarily would be associated with the conversion of land that would be required for operation of the LNG facilities from existing uses to industrial use. There are no residences within 1 mile of the proposed LNG terminal and future potential for development is somewhat reduced because most of the land surrounding the LNG site comprises wetlands and WMAs, and is unsuitable for extensive residential development.

Land use impacts associated with the pipelines would include disturbance of existing land uses within construction work areas along the pipeline and storage and staging areas during construction (1,497 acres) and creation of a new permanent right-of-way for operation and maintenance of the facilities (404.7 acres). Three residences occur within 50 feet of the proposed pipeline construction work areas in Calcasieu and Beauregard Parishes, Louisiana. Sempra land agents and contractors would coordinate with property owners throughout the construction process to minimize impacts to landowners. To minimize disruption to these residents, Sempra would use specialized construction techniques; limit the duration of open trenches; promptly restore driveways and fences; and maintain access to each residence. Sempra has provided site-specific construction plans for these three residences.

Recreation facilities in the vicinity of the Project include the J. D. Murphree WMA, McFaddin and Texas Point National Wildlife Refuges, Sea Rim State Park, Sabine Pass Battleground State Historical Park, Sabine-Neches Waterway, and Sabine Lake in Texas; the Creole Nature Trail/National Scenic Byway (SH 27), Sabine Island WMA, and the Western Corridor (SH 171) in Louisiana; and private hunting clubs in both Louisiana and Texas. No issues or concerns have been identified regarding impacts on these resources from construction or operation of the Project.

Operation of the project facilities would impact recreational boating and fishing during the arrival, unloading, and departure of the LNG ships. If the Coast Guard issues a LOR finding the waterway suitable for LNG marine traffic, the Coast Guard would impose a moving safety zone around LNG ships during transit up the Sabine/Neches Waterway and a moored security zone while berthed at the LNG terminal. If moving safety zones, security zones at the terminal, and one-way traffic were implemented,

they would affect other commercial and recreational traffic using the waterway. The moving safety zones, if implemented, may have the effect of temporarily limiting some commercial shipping route in the Sabine/Neches Waterway to one-way traffic. This presently occurs with large vessels which can sometimes delay other vessels using the waterway as they wait or anchor at suitable locations to allow these vessels to pass. This could cause impacts on recreational boating and fishing but the impacts would be temporary while the boat is in transit or moored at the ship unloading facility. Because the safety zone would be a moving zone around the ship, the impacts would be of short duration at any given point along the shipping route. The Coast Guard has stated that it would make every effort to minimize disruption to other water way users.

The primary Project components that could have a moderate visual impact on the surrounding areas are the marine terminal basin, where large LNG ships would dock, and the six 176-foot-tall LNG storage tanks. Potential public viewpoints include the adjacent J. D. Murphree WMA, SH 87, SH 82, and scattered residences, the nearest of which is 1.6 miles away. However, the shoreline of the Port Arthur Ship Canal is largely industrial and the addition of the proposed LNG terminal facilities would not significantly change the existing viewshed for most viewers. Two visually scenic areas would be crossed by the 70-Mile-Long Pipeline route: the Creole Nature Trail (Highway 27 – a National Scenic Byway) and the Western Corridor Tour (Highway 171). The visual impact of the pipeline corridor from these highway viewpoints would be moderate in the short-term, but once restoration is complete, the long-term effects would be minor.

Much of the Project area is located within the Texas Coastal Zone Management Area (Texas) and a Coastal Zone Environmental Management Unit (Louisiana). Sempra would be required to file applications with the Railroad Commission of Texas and the LADNR to obtain CZMP consistency determinations from both prior to construction. We have recommended that Sempra file copies of the CZMP consistency determinations issued by the Railroad Commission of Texas and LADNR before construction begins.

5.1.10 Socioeconomics

Construction and operation of the Port Arthur LNG Project would result in short- and long-term socioeconomic impacts. The construction workforce for Phase I of the LNG terminal is expected to average 530 workers per month with a peak of 1,247 workers over a 45-month period. Phase II construction at the LNG terminal would require an average of 429 workers for the duration of the 39-month construction period; peaking at about 861 workers. The construction workforces for the highway/utility corridor relocation and the pipelines are expected to average 100 workers over a 6-month period and 240 workers over a 10-month period, respectively. Approximately 50 to 70 percent of the workforce would be composed of non-local workers migrating into the Project area. The temporary influx of the construction workforce would cause a short-term increase in population, which could have minor effects on the availability of temporary housing and public services and traffic around the Project area. Temporary and permanent fiscal benefits would result from construction and operation of the Project in the form of additional tax revenues at the state and county level. Sempra would employ between 79 and 86 full-time workers to maintain and operate the LNG terminal facilities and the pipelines.

During operation of the LNG terminal, although there would be safety zones around transiting LNG ships, the addition of 360 LNG ships per year would not have a long-term impact on commercial ship traffic in the area. The moving safety zone enforced around each LNG ship and moored vessel security zone around the ship unloading facility while a ship is docked would be restricted to other commercial traffic unless permission to enter the zone is obtained from the Captain of the Port. The moving safety zones, if implemented, may have the effect of temporarily limiting the Sabine/Neches Waterway to one-

way traffic. This presently occurs with large vessels which can sometimes delay other vessels using the waterway as they wait or anchor at suitable locations to allow these vessels to pass.

Construction and operation of the proposed projects would not result in disproportionate adverse impacts on environmental justice communities. The projects are expected to generate temporary and permanent employment opportunities, taxes and other revenue streams within the project area and would not result in significant adverse impacts on the local environment and natural resources. Although some of the neighborhoods crossed by the proposed pipeline route have lower incomes than average, the potential impacts would affect all of the communities crossed by the pipeline and would not disproportionately impact only the environmental justice areas.

5.1.11 Cultural Resources

Sempra has consulted with the Texas and Louisiana SHPO and performed cultural resource investigations for the APE. As of the date this EIS was prepared, the completed surveys located two cultural resource sites within the terrestrial portion of the proposed APE. Both sites have been assessed as being potentially eligible for listing to the NRHP. In addition, seven magnetic and/or acoustic anomalies have been identified within the APE of the pipeline crossing of Sabine Lake.

We have recommended that Sempra not be allowed to construct any facilities or use any staging, storage, temporary work areas, or access roads until it files the survey reports, any required treatment plans, and the SHPOs comments with the Commission and is given written authorization to proceed by the Director of the OEP.

5.1.12 Air Quality and Noise

Air emissions resulting from construction of the LNG terminal and associated pipelines would be short-term and would not significantly affect air quality in the region. Sempra would minimize fugitive dust emissions during construction by the use of dust suppression techniques such as watering, if necessary.

During operation of the LNG terminal, air emissions would result from the operation of the hot water heaters, standby natural gas-fired generators, diesel-fired firewater pumps, and fugitive emission sources. Sempra has submitted an application to the TCEQ requesting an air permit to authorize the emissions from the LNG terminal. In addition, emissions would result from maneuvering and hoteling of LNG ships at the marine berth. The determination in the Final General Conformity Determination (**appendix M**) concludes that the direct and indirect emissions from this proposed project would exceed the *de minimus* level for general conformity. The Texas Council on Environmental Quality issued a conditional conformity certification based on a review of Sempra's emissions estimates and commitments made by Sempra to reduce or offset emissions. We have determined that the direct and indirect emissions from the LNG terminal would exceed the *de minimis* level for general conformity. However, with implementation of Sempra's proposed mitigation measures, we conclude, pursuant to 30 Tex. Admin. Code 101.30(h)(1)(E)(iv), that the total of direct and indirect emissions from the LNG terminal for the future years does not increase emissions with respect to the future baseline emissions. No impacts to air quality would result from the operation of the pipeline facilities.

Except for pile driving, construction activities would be unlikely to increase the existing ambient levels at the nearest NSAs when equipment is in operation. Sempra plans on limiting pile driving to daylight hours, 5 days per week, to reduce noise impacts during its expected 8-month duration per phase. However, because of the number of piles to be driven, it may be necessary to drive piles outside of the planned construction window. We have recommended that prior to any nighttime or weekend pile

driving, Sempra conduct a noise survey at the nearest noise sensitive areas to establish actual noise levels during pile driving activities. If the actual noise levels during pile driving activities exceed ambient nighttime noise levels, Sempra would develop a noise mitigation plan to reduce noise levels during the weekend and/or nighttime period and document that the noise mitigation plan effectively reduces noise from construction pile driving activities. This plan would be filed for review and written approval prior to the start of any nighttime or weekend pile driving.

Sempra performed computer modeling to calculate noise levels that would be generated by operation of the proposed LNG terminal. Calculated noise levels anticipated from operation of the LNG terminal would be below 55 dBA. No adverse, long-term impacts would therefore be anticipated. However, we have recommended that Sempra complete a noise survey no later than 60 days after the Project goes into operation to confirm that noise attributable to operation of the LNG terminal would not exceed an L_{dn} above the ambient levels at the three nearest NSAs.

5.1.13 Alternatives

The EIS addresses alternatives to the proposed actions before both the FERC and the Coast Guard. The proposed action before the FERC is to consider issuing to Sempra a section 3 authorization for the LNG import facilities and a section 7 Certificate of Public Convenience and Necessity for a new natural gas pipeline. The proposed action before the Coast Guard issuance of a Coast Guard LOR finding the waterway suitable for LNG marine traffic, with certain conditions. Section 3 of the EIS clearly describes the criteria for alternative selection.

We considered the alternatives of no action or postponed action, system alternatives, alternative LNG terminal sites, and pipeline route alternatives. While the no action or postponed action alternatives would eliminate or postpone the environmental impacts identified in this EIS, the objectives of the proposed Project would not be met and Sempra would not be able to provide a new source of natural gas supply to the U.S.

For the Coast Guard's proposed action, the no action alternative would be issuance of Coast Guard LOR finding the waterway not suitable for LNG marine traffic. Similar to the no action alternative to the FERC proposed action, the no action alternative for the Coast Guard would avoid any project related environmental effects; however, it would also prevent LNG vessels from delivering LNG to an import terminal and the project objectives would not be met. Reasonable alternatives to the Coast Guard action of issuing an LOR include: 1) Issuance of a Coast Guard LOR finding the waterway suitable for LNG marine traffic without any conditions, and 2) Postponing the issuance of a Coast Guard LOR pending further analysis and study.

Our analysis assessed 18 existing, permitted, or proposed LNG facilities in the region and assessed expansion potential and extent of additional environmental impact if this Project were to be included at one of these sites. Our conclusion was that none of the existing, approved, or proposed onshore LNG terminal facilities could handle the additional volumes proposed by Sempra without significant expansion of the proposed facilities and associated environmental impact. With respect to offshore existing, permitted or proposed LNG facilities, we conclude that, although offshore technologies provide an alternative means for the import of LNG, the proposed offshore technologies would not provide the same capability as the proposed Port Arthur LNG Project and would likely result in a similar level of (although different) environmental impacts. With respect to onshore alternative locations not yet proposed, we concluded there are no practical alternative sites which meet the Project purpose and that offer a clear environmental advantage to the proposed Port Arthur LNG terminal site.

An alternative to the Coast Guard action of issuing a LOR which finds the waterway suitable for LNG vessel traffic with certain conditions is to issue an LOR without any conditions. This would avoid the environmental effects related to any moving safety and moored vessel security zones, or other related LNG safety and security activities, which the Coast Guard would determine is necessary prior to the commencement of LNG vessels transiting the waterway. If the Coast Guard postpones issuance of an LOR pending further analysis or study, the effect is expected to be similar to the FERC postponing its action. That is, although it is speculative to predict the resulting effects, postponing issuance of an LOR may lead to Sempra deciding to delay its entire project.

We also assessed four alternative sites for disposal of dredge materials from the marine basin and berth area. None of these alternatives was superior to the proposed location.

With respect to the pipeline alternatives, we concluded that there were no practicable system alternatives or design alternatives. Sempra evaluated several pipeline routes before selecting the proposed corridors within which it designed the preferred routes for the pipelines. We evaluated six route variations to avoid or minimize impacts on sensitive resources and a proposed development area. We have recommended use of the Pearl Crossing route variation to avoid wetland impacts. We identified no other route variations that would significantly reduce environmental impacts.

In conclusion, we have determined that the proposed Sempra project, as modified by our recommended mitigation and route variation, is the preferred alternative that can meet the project objectives.

5.1.14 Reliability and Safety

We evaluated the safety of both the proposed LNG import terminal facility and the related LNG vessel transit through the Sabine Pass Channel and on into the Port Arthur Ship Canal. With respect to the onshore facility, we completed a cryogenic design and technical review of the proposed terminal design and safety systems. Several areas of concern were noted and specific recommendations to be addressed prior to construction have been identified. Additional recommendations have been included to address technical design and cryogenic issues.

Thermal radiation and flammable vapor hazard distances were also calculated for an accident or an attack on an LNG vessel. For 1.4-meter and 3-meter-diameter holes in an LNG cargo tank, we estimated distances to range from 2,790 to 4,652 feet for a thermal radiation level of 1,600 Btu/ft^2-hr, the level which is hazardous to unprotected persons located outdoors. However, the evaluation of safety is more than an exercise in calculating the consequences of worst-case scenarios. Rather, it is a determination of the acceptability of risk which considers: the probability of events; the effect of mitigation; and the consequences of events. Based on the extensive operational experience of LNG shipping, the structural design of an LNG vessel, and the operational controls imposed by the Coast Guard and the local pilots, the likelihood of a cargo containment failure and subsequent LNG spill from a vessel casualty – collision, grounding, or allision – is highly unlikely. For similar reasons, an accident involving the onshore LNG import terminal is unlikely to affect the public. As a result, the risk to the public from accidental causes should be considered negligible.

As part of our marine safety analysis, we considered how vessel security requirements for LNG ships calling on the proposed LNG terminal might affect other ship and boat traffic in the Sabine/Neches Waterway. Based on the Coast Guard's longstanding experience in controlling the movements of dangerous cargo vessels in the Sabine/Neches Waterway and LNG vessels in other ports, potential impacts can be evaluated for several general security requirements: 1) moving safety zone for inbound and outbound LNG vessels; 2) security zone around a moored LNG vessel; and 3) other measures as deemed appropriate. If the Coast Guard issues a LOR finding the waterway suitable for LNG marine

traffic, the moving safety zone, and the security zone at the terminal, may affect other commercial and recreational traffic using the waterway. The addition of 360 LNG ships per year would have minor effect on ship traffic on the Sabine/Neches Waterway.

The extent of the impact on recreational boaters would depend on the number of boats in the project area during the daily LNG vessel transits when LNG ships would call on the LNG terminal, and on several other variables such as the size of the Coast Guard-imposed moving safety and moored security zone and the width of the channel at the point where a boat encounters the LNG ship. To minimize potential impacts on other marine traffic, the Coast Guard is expected to use a program of announcements to give advance notice of each moving safety and moored security zone schedule and could schedule the transit of LNG ships for times of day less likely to affect recreational boaters.

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, having a large volume of energy transported and stored near populated areas, the perceived threat of a terrorist attack is a primary concern of the local population and requires that resources be directed to mitigate possible attack paths. While the risks associated with the transportation of any hazardous cargo can never be entirely eliminated, they can be managed.

An issue that has developed for several LNG terminal projects is a concern that local communities would have to bear some of the costs of ensuring the security/emergency management of the LNG facility and the LNG vessel while in transit and unloading at the dock. The specific security/emergency management costs for the proposed project are not yet available. The final costs associated with security would be determined after the specific security needs and responsibilities have been established by the Coast Guard through consultations with other federal, state, and local agencies.

As required by its regulations (section 127.009), the Coast Guard is responsible for issuing a LOR as to the suitability of the waterway for LNG marine traffic. Sempra submitted a LOI to the Coast Guard on December 10, 2004. In December 2005 Sempra submitted a WSA for the proposed project to the Captain of the Port for Coast Guard in Port Arthur. The Coast Guard has completed a review of Sempra's WSA in accordance with the guidance in NVIC 05-05.

On March 20, 2006, the Coast Guard sent a letter to FERC, based on the above WSA. As described in this document, the Coast Guard has preliminarily determined that the Sabine/Neches Waterway to the proposed LNG terminal in Port Arthur, Texas, may be suitable for accommodating the type and frequency of LNG vessels being proposed by the applicant. This determination, however, is preliminary because the required NEPA analysis has not yet been completed. This determination is also contingent upon the port security community having the appropriate resources to implement all the measures necessary to responsibly manage the safety and security risks of LNG marine traffic in this area.

Once these plans are finalized and the resources required to implement them have been identified, Sempra will be able to more specifically discuss the funding of such resources. In order to better define how the potential burden on local communities would be addressed, we have recommended that Sempra provide a plan that identifies the mechanisms for funding project-specific security/emergency management costs that would be imposed on state agencies and local communities.

5.2 FERC STAFF'S RECOMMENDED MITIGATION

If the Commission issues their authorization for the proposed Project, we recommend that the Commission's Order include measures 1 through 69. We believe that these measures would further mitigate the environmental impacts associated with the construction and operation of the proposed Project:

1. Sempra shall follow the construction procedures and mitigation measures described in its application, supplemental filings (including responses to staff data requests), and as identified in the EIS, unless modified by this Order. Sempra must:

    a. request any modification to these procedures, measures, or conditions in a filing with the Secretary;
    b. justify each modification relative to site-specific conditions;
    c. explain how that modification provides an equal or greater level of environmental protection than the original measure; and
    d. receive approval in writing from the Director of the OEP **before using that modification**.

2. For the LNG facilities, the Director of OEP has delegation authority to take whatever steps are necessary to ensure the protection of life, health, property and the environment during construction and operation of the Project. This authority shall allow:

    a. stop-work authority and authority to cease operation; and
    b. the design and implementation of any additional measures deemed necessary to assure continued compliance with the intent of the conditions of this Order.

3. For the pipeline facilities, the Director of OEP has delegation authority to take whatever steps are necessary to ensure the protection of all environmental resources during construction and operation of the Project. This authority shall allow:

    a. the modification of conditions of this Order; and
    b. the design and implementation of any additional measures deemed necessary (including stop work authority) to assure continued compliance with the intent of the environmental conditions as well as the avoidance or mitigation of adverse environmental impact resulting from Project construction and operation.

4. **Prior to any construction**, Sempra shall file an affirmative statement with the Secretary, certified by a senior company official, that all company personnel, EIs, and contractor personnel will be informed of the EI's authority and have been or will be trained on the implementation of the environmental mitigation measures appropriate to their jobs **before** becoming involved with construction and restoration activities.

5. The authorized facility locations shall be as shown in the EIS, as supplemented by filed alignment sheets, and shall include the staff's recommended facility locations. **As soon as they are available, and before the start of construction**, Sempra shall file with the Secretary revised detailed survey alignment maps/sheets at a scale not smaller than 1:6,000 with station positions for all facilities approved by this Order. All requests for modifications of environmental conditions of this Order or site-specific clearances must be written and must reference locations designated on these alignment maps/sheets.

Sempra's exercise of eminent domain authority granted under the NGA Section 7(h) in any condemnation proceedings related to the Order for the pipeline must be consistent with these authorized facilities and locations. Sempra's right of eminent domain granted under NGA Section 7(h) does not authorize it to increase the size of its natural gas pipeline to accommodate future needs or to acquire a right-of-way for a pipeline to transport a commodity other than natural gas.

6. Sempra shall file with the Secretary detailed alignment maps/sheets and aerial photographs at a scale not smaller than 1:6,000 identifying all route realignments or facility relocations, and staging areas, pipe storage yards, new access roads, and other areas that would be used or disturbed and have not been previously identified in filings with the Secretary. Approval for each of these areas must be explicitly requested in writing. For each area, the request must include a description of the existing land use/cover type, documentation of landowner approval, whether any cultural resources or federally listed threatened or endangered species would be affected, and whether any other environmentally sensitive areas are within or abutting the area. All areas shall be clearly identified on the maps/sheets/aerial photographs. Each area must be approved in writing by the Director of OEP **before construction** in or near that area.

   This requirement does not apply to extra workspace allowed by the *Upland Erosion Control, Revegetation, and Maintenance Plan* or minor field realignments per landowner needs and requirements that do not affect other landowners or sensitive environmental areas such as wetlands.

   Examples of alterations requiring approval include all route realignments and facility location changes resulting from:

   a. implementation of cultural resources mitigation measures;
   b. implementation of endangered, threatened, or special concern species mitigation measures;
   c. recommendations by state regulatory authorities; and
   d. agreements with individual landowners that affect other landowners or could affect sensitive environmental areas.

7. **At least 60 days before construction begins**, Sempra shall file an Implementation Plan with the Secretary for the review and written approval by the Director of OEP describing how Sempra will implement the mitigation measures required by this Order. Sempra must file revisions to the plan as schedules change. The plan shall identify:

   a. how Sempra will incorporate these requirements into the contract bid documents, construction contracts (especially penalty clauses and specifications), and construction drawings so that the mitigation required at each site is clear to onsite construction and inspection personnel;
   b. the number of EIs assigned per spread, and how the company will ensure that sufficient personnel are available to implement the environmental mitigation;
   c. company personnel, including EIs and contractors, who will receive copies of the appropriate material;
   d. what training and instructions Sempra will give to all personnel involved with construction and restoration (initial and refresher training as the Project progresses and personnel change), with the opportunity for OEP staff to participate in the training session(s);
   e. the company personnel (if known) and specific portion of Sempra's organization having responsibility for compliance;
   f. the procedures (including use of contract penalties) Sempra will follow if noncompliance occurs; and
   g. for each discrete facility, a Gantt or PERT chart (or similar project scheduling diagram), and dates for:

(1) the completion of all required surveys and reports;
(2) the mitigation training of onsite personnel;
(3) the start of construction; and
(4) the start and completion of restoration.

8. Sempra shall develop and implement an environmental complaint resolution procedure. The procedure shall provide landowners with clear and simple directions for identifying and resolving their environmental mitigation problems/concerns during construction of the Project and restoration of the right-of-way. **Prior to construction**, Sempra shall mail the complaint procedures to each landowner whose property would be crossed by the Project.

   a. In its letter to affected landowners, Sempra shall:

      (1) provide a local contact that the landowners should call first with their concerns; the letter should indicate how soon a landowner should expect a response;
      (2) instruct the landowners that, if they are not satisfied with the response, they should call Sempra's Hotline; the letter should indicate how soon to expect a response; and
      (3) instruct the landowners that, if they are still not satisfied with the response from Sempra's Hotline, they should contact the Commission's Enforcement Hotline at (888) 889-8030.

   b. In addition, Sempra shall include in its weekly status report a copy of a table that contains the following information for each problem/concern:

      (1) the date of the call;
      (2) the identification number from the certificated alignment sheets of the affected property;
      (3) the description of the problem/concern; and
      (4) an explanation of how and when the problem was resolved, will be resolved, or why it has not been resolved.

9. Sempra shall employ a team of EIs (at least two per construction spread) with one available at the LNG terminal as appropriate during site preparation. The EI(s) shall be:

   a. responsible for monitoring and ensuring compliance with all mitigation measures required by this Order and other grants, permits, certificates, or other authorizing documents;
   b. responsible for evaluating the construction contractor's implementation of the environmental mitigation measures required in the contract (see condition 6 above) and any other authorizing document;
   c. empowered to order correction of acts that violate the environmental conditions of this Order, and any other authorizing document;
   d. a full-time position, separate from all other activity inspectors;
   e. responsible for documenting compliance with the environmental conditions of this Order, as well as any environmental conditions/permit requirements imposed by other Federal, state, or local agencies; and
   f. responsible for maintaining status reports.

10. Sempra shall file updated status reports prepared by the EI with the Secretary on a weekly basis until all construction and restoration activities are complete. On request, these status reports will also be provided to other federal and state agencies with permitting responsibilities. Status reports shall include:

a. the current construction status of the Project, work planned for the following reporting period, and any schedule changes for stream crossings or work in other environmentally sensitive areas;
b. a listing of all problems encountered and each instance of noncompliance observed by the EI(s) during the reporting period (both for the conditions imposed by the Commission and any environmental conditions/permit requirements imposed by other federal, state, or local agencies);
c. corrective actions implemented in response to all instances of noncompliance, and their cost;
d. the effectiveness of all corrective actions implemented;
e. a description of any landowner/resident complaints which may relate to compliance with the requirements of this Order, and the measures taken to satisfy their concerns; and
f. copies of any correspondence received by Sempra from other federal, state or local permitting agencies concerning instances of noncompliance, and Sempra's response.

11. Sempra must receive written authorization from the Director of OEP **before commencing service** from the LNG terminal and other components of the project. Such authorization will only be granted following a determination that the LNG facility has been constructed in accordance with Commission approval and applicable standards, can be expected to operate safely as designed, and that rehabilitation and restoration of the right-of-way is proceeding satisfactorily.

12. **Within 30 days of placing the authorized facilities in service**, Sempra shall file an affirmative statement with the Secretary, certified by a senior company official:

    a. that the facilities have been constructed in compliance with all applicable conditions, and that continuing activities will be consistent with all applicable conditions; or
    b. identifying which of the certificate conditions Sempra has complied with or will comply with. This statement shall also identify any areas along the right-of-way where compliance measures were not properly implemented, if not previously identified in filed status reports, and the reason for noncompliance.

13. Sempra shall file the comments of the Texas SHPO and FWS on Entergy's planned electric transmission lines with the Secretary **prior to its construction**. Sempra shall defer obtaining service from the planned electric transmission lines until the comments have been filed with the Secretary.

14. Sempra shall incorporate the Pearl Crossing Route Variation, including the construction methods and right-of-way widths into its proposed route and construction plans.

15. Sempra shall develop a plan for construction in the vicinity of the known abandoned wells on the terminal site. This plan shall include a discussion of maintaining the integrity of the plugs. In addition, Sempra shall develop a plan of action if any unidentified wells are discovered during construction. Both of these plans shall be filed with the Secretary for review and written approval by the Director of OEP **before construction of the terminal.**

16. Sempra shall file with the Secretary detailed construction plans for the crossing of Keith Lake Cut. This shall be a site-specific plan that includes scaled drawings identifying all areas that would be disturbed by construction. The Director of OEP must review and approve this plan in writing **before construction of the 3-Mile-Long Pipeline**.

17. Sempra shall file with the Secretary detailed construction plans for the crossing of Keith Lake. This shall be a site-specific plan that includes scaled drawings identifying all areas that would be disturbed by construction. The Director of OEP must review and approve this plan in writing **before construction of the 3-Mile-Long Pipeline**.

18. Sempra shall file with the Secretary a plan for the crossing of each waterbody proposed as a HDD crossing in the event that the HDD is unsuccessful. These shall be site-specific plans that include scaled drawings identifying all areas that would be disturbed by construction. Sempra shall file these plans along with the COE permit when it is obtained. The Director of OEP must review and approve these plans in writing **before construction of the crossings**.

19. Sempra shall submit a Directional Drill Contingency Plan for each waterbody crossed by directional drilling. Each Directional Drill Contingency Plan shall address how Sempra:

    a. will handle any in inadvertent release of drilling mud into the waterbody or areas adjacent to the waterbody, including specific procedures to contain inadvertent releases;

    b. will seal the abandoned drill hole; and

    c. will clean up any inadvertent releases.

    Sempra shall file each plan with the Secretary for review and written approval by the Director of OEP **before construction of each HDD.**

20. If Sempra is unable to construct the pipeline between MPs 18 and 28.1 using the Pearl Crossing Route Variation because another pipeline has been authorized in that location, Sempra shall use its proposed route with the following modification. Sempra shall cross the north bank of Sabine Lake using a horizontal directional drill. In addition Sempra shall relocate the mainline valve proposed for MP 19.2 to a location onshore north of the levee, near MP 19.9.

21. Sempra shall revise its alignment sheets for the 3-Mile-Long and 70-Mile-Long Pipelines where they would be in the same temporary construction right-of-way (MP 0.0 to MP 1.0) to show a maximum width of 110 feet with respect to the construction right-of-way in wetlands. The revised construction plans and alignment sheets shall be filed with the Secretary for review and written approval by the Director of OEP **before construction of the pipelines**.

22. Sempra shall limit its construction right-of-way to 100 feet in wetland areas where the two proposed pipelines would not be within the same right-of-way (between MPs 1.0 and 1.2 and MPs 19.2 and 35.4) and where the push method can be used. If additional right-of-way is required, Sempra shall file with the Secretary for review and written approval by the Director of OEP a site-specific construction plan and written justification **before use of any additional right-of-way width**.

23. **Prior to construction,** Sempra shall file with the Secretary the <u>finalized</u> Aquatic Resources Mitigation Plan (including a <u>finalized</u> Wetland Mitigation Plan) developed in consultation with, and approved by, the COE, NOAA Fisheries, FWS, TCEQ, LADNR, EPA, and LADWF. In addition to the information currently provided in Sempra's Revised Draft Wetland Mitigation Plan, as ultimately approved by the agencies, the <u>finalized</u> Aquatic Resources Mitigation Plan (including a <u>finalized</u> Wetland Mitigation Plan) also shall include EFH impacts and agency-approved mitigation for those impacts.

24. Sempra shall hire and fund a third-party contractor to work under the direction of the Commission staff for the sole purpose of monitoring compliance with the environmental conditions provided in the EIS and all mitigation measures proposed by Sempra. Sempra shall develop a draft monitoring program and obtain proposals from potential contractors to provide monitoring services, and file the

program and proposals with the Secretary for review and approval by the Director of OEP at least 60 days before the anticipated start of pipeline construction. The monitoring program shall include:

a. the employment by the contractor of one to two full-time on-site monitors per construction spread;
b. the employment by the contractor of a full-time compliance manager to direct and coordinate with the monitors, manage the reporting system, and provide technical support to the FERC staff;
c. a systematic strategy for the review and approval by the contract compliance manager and monitors of variances to certain construction activities as may be required by Sempra based on site-specific conditions;
d. the development of an internet website for posting daily or weekly inspection reports submitted by both the third-party monitors and Sempra's environmental inspectors; and
e. a discussion of how the monitoring program can incorporate and/or be coordinated with the monitoring or reporting that may be required by other Federal and state agencies.

25. Sempra shall consult with NOAA Fisheries and address its concerns regarding restoration of shell reefs in Sabine Lake, monitoring of wetlands along the pipelines for a period of no less than 3 years and the development of appropriate mitigation ratios (and timing for development of mitigation areas) for EFH impacts and for long-term (over 3 years) impacts to tidally influenced wetlands along the pipelines. Documentation of these consultations should be filed with the Secretary **before construction of any facilities**.

26. Sempra shall implement the mitigation measures contained in the *Vessel Strike Avoidance and Injured/Dead Protected Species Reporting Policy* found in appendix L of the final environmental impact statement for the Port Arthur LNG Project in its Terminal Use Agreement.

27. **Sempra shall provide, prior to construction of the terminal,** a lighting design plan and operational procedures to minimize impact on the bird population. This plan shall be developed in consultation with FWS and appropriate state agencies.

28. If construction of the LNG terminal or pipeline system has not begun within 1 year from the date of FERC approval of the Project, Sempra shall consult with the appropriate offices of the FWS and NOAA Fisheries to update the species lists and to verify previous consultations and the need for additional surveys and survey reports (if required). The FWS and NOAA Fisheries comments and conclusions on the surveys and survey reports, if any are required, shall be filed with the Secretary **before construction**.

29. Sempra shall not **begin construction** of any facilities associated with the Port Arthur LNG Project until it files with the Secretary a copy of the CZMP consistency determinations issued by the Railroad Commission of Texas and the LADNR.

30. Sempra shall **defer** implementation of any treatment plans/measures (including archeological data recovery); construction of facilities, and the use of all staging, storage, temporary work areas, and new or to-be-improved access roads **until**:

a. Sempra files with the Secretary, all cultural resources survey reports, any required treatment plans, and the SHPO's comments; and
b. The Director of OEP reviews and approves all cultural resources survey reports and plans**,** and notifies Sempra in writing that treatment plans/measures may be implemented or that construction may proceed**.**

All material filed with the Commission containing location, character, and ownership information about cultural resources must have the cover and any relevant pages therein clearly labeled in bold lettering: **"CONTAINS PRIVILEGED INFORMATION—DO NOT RELEASE."**

31. Sempra **shall not begin construction** of the Project **until** the Commission has issued its final conformity certification and Sempra has received written approval by the Director of OEP of its filing stating that it would comply with all requirements of the General Conformity Determination.

32. Sempra shall develop a noise mitigation plan to reduce noise associated with pile-driving activities. This plan shall include an evaluation of potential mitigation measures including the use of vibratory hammers, augered piles, and/or a noise sleeve installed over the pile column to reduce pile driving noise levels. The plan shall identify which mitigation measures would be used, the hours and days of the week that pile driving activities would occur, and what standards would be used to determine when the use of noise mitigation would be required. The final plan shall be filed with the Secretary, for review and written approval by the Director of OEP, **prior to the initiation of any construction activities.**

33. Sempra shall make all reasonable efforts to ensure its predicted noise levels from the Port Arthur LNG Terminal are not exceeded at nearby NSAs and file noise surveys showing this with the Secretary **no later than 60 days after placing the Port Arthur LNG Terminal in service**. However, if the noise attributable to the operation of the Port Arthur LNG Terminal exceeds an L_{dn} of 55 dBA at any nearby NSAs, Sempra shall file a report on what changes are needed and shall install additional noise controls to meet the level within 1 year of the in-service date. Sempra shall confirm compliance with this requirement by filing a second noise survey with the Secretary **no later than 60 days** after it installs the additional noise controls.

34. For areas where the Port Arthur LNG Project would be co-located with one or more planned pipeline(s) adjacent to an existing right-of-way, the first pipeline to be constructed shall be constructed closest to the existing right-of-way. The Port Arthur pipeline shall be constructed with a 25-foot offset from the nearest existing pipeline. For the Port Arthur LNG Project, these areas include:

MILEPOST	CO-LOCATING PROJECT
53.5 to 70.0	Liberty Storage Project
53.5 to 70.0	Cameron LNG Project
69.1 to 69.4	Creole Trail LNG Project

Prior to construction, Sempra shall file alignment sheets and environmental information to support the new alignment with the Secretary for review and written approval by the Director of OEP.

35. **Prior to accepting** ships greater than 140,000 cubic meters in capacity, Sempra shall provide the necessary information to demonstrate that the transient hazard areas identified in the final EIS are applicable. Sempra shall file this information with the Secretary for review and written approval of the Director of OEP. This information shall also be provided to the Coast Guard.

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 review and approval by 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 indicated by each specific recommendation. Items relating to Resource Report 13-Engineering and

Design Material and security shall be submitted as critical energy infrastructure information (CEII) pursuant to 18 CFR § 388.112 and PL01-1. Information pertaining to items such as: offsite emergency response; procedures for public notification and evacuation; and construction and operating reporting requirements would be subject to public disclosure. All information shall be submitted a minimum of 30 days before approval to proceed is required.

36. 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, HD-5.

37. The location of flammable gas detectors used to shut down fired equipment shall be evaluated **prior to initial site preparation**.

    The evaluation shall include:

    a. Identifying all combustion/ventilation air intake equipment and the distance(s) to any possible hydrocarbon release (LNG, flammable refrigerants, flammable liquids, and flammable gases).

    b. Demonstrating that these areas are adequately covered by hazard detection devices and indicating how these devices would isolate or shutdown any combustion equipment whose continued operation could add to, or sustain an emergency.

38. A complete plan and list of the fixed and wheeled dry-chemical, fire extinguishing, high expansion foam, hazard control equipment shall be filed **prior to initial site preparation**. The information shall include a list with the equipment tag number, type, size, equipment covered, and automatic and manual remote signals initiating discharge of the units. Plan drawings shall clearly show the planned location of all fixed and wheeled extinguishers.

39. Facility plans shall be provided showing the proposed location of, and area covered by, each monitor, hydrant, deluge system, hose and sprinkler. Details of the design shall be filed **prior to initial site preparation** and shall include P&IDs of the proposed fire water system.

40. A detailed plan and section drawings of the troughs, containment and segments used to calculate vapor dispersion shall be provided **prior to initial site preparation**.

41. Sempra shall examine provisions to retain any vapor produced along the transfer line trenches and other areas serving to direct LNG spills to associated impoundments. Measures to be considered may include, but are not limited to: vapor fencing; intermediate sump locations; or trench surface area reduction. Sempra shall file final drawings and specifications for these measures with the Secretary 30 days **prior to initial site preparation** for review and approval by the Director of OEP.

42. Sempra shall develop an Emergency Response Plan (including evacuation) and coordinate procedures with the Coast Guard, state, county, and local emergency planning groups, fire departments, state and local law enforcement, and appropriate federal agencies. This plan shall include at a minimum:

    a. designated contacts with state and local emergency response agencies;

    b. scalable procedures for the prompt notification of appropriate local officials and emergency response agencies based on the level and severity of potential incidents;

c. procedures for notifying residents and recreational users within areas of potential hazard;

d. evacuation routes/methods for residents of Sabine, Sabine Pass, Pleasure Island and other public use areas that are within any transient hazard areas;

e. locations of permanent sirens and other warning devices; and

f. an "emergency coordinator" on each LNG vessel to activate sirens and other warning devices.

The Emergency Response Plan shall be filed with the Secretary for review and written approval by the Director of OEP **prior to initial site preparation**. Sempra shall notify FERC staff of all planning meetings in advance and shall report progress on the development of its Emergency Response Plan at **3-month** intervals.

43. The Emergency Response Plan shall include a Cost-Sharing Plan identifying the mechanisms for funding all project-specific security/emergency management costs that would be imposed on state and local agencies. In addition to the funding of direct transit-related security/emergency management costs, this comprehensive plan shall include funding mechanisms for the capital costs associated with any necessary security/emergency management equipment and personnel base. The Cost-Sharing Plan shall be filed with the Secretary for review and written approval by the Director of OEP **prior to initial site preparation**.

44. The **final design** of the hazard detection equipment shall identify manufacturer and model.

45. The **final design** shall specify that open path detectors shall be calibrated to detect the presence of flammable gas and alarm at the lowest reliable set point, in addition to the required 25 percent LEL set point.

46. The **final design** shall include provisions for all flammable gas and UV/IR hazard detectors to be equipped with local instrument status indication as an additional safety feature.

47. 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.

48. The **final design** of the fixed and wheeled dry-chemical, fire extinguishing, and high expansion foam hazard control equipment shall identify manufacturer and model.

49. The **final design** shall include details of the LNG tank tilt settlement and differential settlement limits between each LNG tank and piping and procedures to be implemented in the event that limits are exceeded.

50. The **final design** shall include drawings and specifications of the spill protection system to be applied to the LNG tank roofs.

51. The **final design** shall include details of the boiloff gas flow measurement system provided for each tank.

52. The **final design** shall include provisions to ensure that hot water circulation is operable at all times when LNG is present in the LNG booster pump discharge piping or when the temperature in the LNG inlet channel to any vaporizer is below 35°F.

53. The **final design** shall include a fire protection evaluation carried out in accordance with the requirements of NFPA 59A, chapter 9.1.2.

54. The **final design** shall include details of the shut down logic and cause and effect matrices for alarms and shutdowns.

55. The **final design** shall include emergency shutdown of equipment and systems activated by hazard detection devices for flammable gas, fire, and cryogenic spills, when applicable.

56. The **final design** shall include details of the instrumentation for detecting leaks through pass through seals. The instrumentation shall be designed to continuously monitor, alarm and shut down associated equipment.

57. Security personnel requirements for prior to and during LNG vessel unloading shall be filed **prior to commissioning**.

58. Operation and Maintenance procedures and manuals, as well as safety procedure manuals, shall be filed **prior to commissioning**.

59. Copies of the Coast Guard security plan and vessel operation plan shall be provided to the FERC staff **prior to commissioning**.

60. The contingency plan for failure of the LNG tank outer containment shall be filed **prior to commissioning**.

61. 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**.

62. **Prior to commissioning**, Sempra shall coordinate, as needed, with the Coast Guard to define the responsibilities of Sempra's security staff in supplementing other security personnel and in protecting the LNG ships and terminal.

63. The FERC staff shall be notified of any proposed revisions to the security plan and physical security of the facility **prior to commencement of service**.

64. Progress on the proposed construction project shall be reported in monthly reports filed with the Secretary. Details shall include a summary of activities, projected schedule for completion, problems encountered and remedial actions taken. Problems of significant magnitude shall be reported to the FERC **within 24 hours**.

In addition, we recommend that the following inspecting and reporting measures be applied throughout the life of the facility:

65. 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, the Company shall respond to a specific data request including information relating to possible design and operating conditions that may have been imposed by other agencies or organizations. Up-to-date detailed piping and instrumentation diagrams reflecting facility modifications and provision of other pertinent information not included in the semi-annual reports described below, including facility events that have taken place since the previously submitted annual report, shall be submitted.

66. **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.), 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 boiloff rates. Adverse weather conditions and the effect on the facility also shall be reported. Reports shall be submitted **within 45 days** after each period ending **June 30 and December 31**. In addition to the above items, a section entitled "Significant plant modifications proposed for the next 12 months (dates)" also shall be included 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.

67. In the event the temperature of any region of the outer containment, including imbedded pipe supports, becomes less than the minimum specified operating temperature for the material the Commission shall be notified **within 24 hours** and procedures for corrective action shall be specified.

68. 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 FERC staff. 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. In all instances, notification shall be made to FERC staff **within 24 hours**. This notification practice shall be incorporated into the LNG facility's emergency plan. Examples of reportable LNG-related incidents include:

    a. fire;

    b. explosion;

    c. estimated property damage of $50,000 or more;

    d. death or personal injury necessitating in-patient hospitalization;

    e. free flow of LNG for five minutes or more that results in pooling;

    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;

    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;

    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 operating pressure (or

working pressure for LNG facilities) plus the build-up allowed for operation of pressure limiting or control devices;

i. a leak in an LNG facility that contains or processes gas or LNG that constitutes an emergency;

j. inner tank leakage, ineffective insulation, or frost heave that impairs the structural integrity of an LNG storage tank;

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 shutdown of operation of a pipeline or an LNG facility that contains or processes gas or LNG;

l. safety-related incidents to LNG vessels occurring at or en route to and from the LNG facility; or

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.

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, 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.

69. Sempra shall **annually** review its waterway suitability assessment relating to LNG vessel traffic for the project; update the assessment to reflect changing conditions which may impact the suitability of the waterway for LNG marine traffic; provide the updated assessment to the cognizant Captain of the Port/Federal Maritime Security Coordinator (COTP/FMSC) for review and validation if appropriate, further action by the COTP/FMSC relating to LNG vessel traffic; and provide a copy to the FERC staff.