2.0 DESCRIPTION OF THE PROPOSED ACTION

2.1 EXISTING FACILITIES

The LNG terminal would be located on 74 acres of a 1,196-acre site owned by Occidental Chemical. The LNG terminal site consists of industrial land and open space and is bordered by the La Quinta Channel to the west, the Occidental Chemical manufacturing complex to the north, a Navy Dredge Disposal Area to the east, and privately owned undeveloped industrial land to the south. The Occidental Chemical manufacturing complex includes facilities owned and operated by DuPont (freon manufacturing), Air Liquide (air separation), and ICLP who operate a 400-megawatt plant that supplies power and steam to the manufacturing complex and electric grid.

2.2 PROPOSED FACILITIES

Ingleside San Patricio proposes to construct and operate a new LNG import, storage, and vaporization terminal on the northeast shoreline of Corpus Christi Bay, west of Ingleside, in San Patricio County, Texas. In addition, Ingleside San Patricio proposes to construct and operate a new natural gas pipeline extending from the LNG terminal to north of Sinton. A general LNG terminal location plan is shown on figure 2.2-1. The proposed LNG terminal plot plan is shown on figure 2.2-2. Detailed pipeline route maps are included in appendix C (see figures C1 to C9). The following section describes the proposed LNG terminal and pipeline facilities, land requirements, construction procedures and schedule, environmental compliance and inspection monitoring, operation and maintenance procedures, safety controls, and nonjurisdictional facilities.

2.2.1 LNG Terminal Facilities

The LNG terminal facilities would consist of a ship unloading facility (marine terminal, ship maneuvering area, and one ship berth), two LNG storage tanks, vaporization and vapor handling system, and support buildings and piping structures. The terminal facility would be located on about 74 acres of land along the east side of La Quinta Channel.

2.2.1.1 Marine Terminal Basin and Berth

The LNG terminal would include a new marine basin that consists of a maneuvering area and one LNG ship berth. The terminal would have the capacity to unload up to 140 LNG ships per year, or between two and three ships per week.

The LNG ships would travel from the Gulf of Mexico into Corpus Christi Bay via Port Aransas. From Port Aransas, the LNG ships would travel in a westerly direction along the Corpus Christi Channel for about 6 miles before turning in a north-northwesterly direction to the La Quinta Channel. The LNG ships would travel along the La Quinta Channel for about 4 miles passing Ingleside-on-the-Bay to the east and Ingleside Point to the west before reaching Ingleside San Patricio's proposed marine basin. The existing authorized depth of the Corpus Christi Channel and the La Quinta Channel is 45 feet. The La Quinta Channel is 5.5 miles long and between 300 to 400 feet wide.

Non-Internet Public

FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE PROPOSED INGLESIDE ENERGY CENTER LNG TERMINAL AND PIPELINE PROJECT
Docket Nos. CP05-11-000, et al.

Page 2-2
Figure 2.2-1
LNG Terminal Location Map

Public access for the above information is available only through the Public Reference Room, or by e-mail at public.referenceroom@ferc.gov.

Non-Internet Public

FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE PROPOSED INGLESIDE ENERGY CENTER LNG TERMINAL AND PIPELINE PROJECT
Docket Nos. CP05-11-000, et al.

Page 2-3
Figure 2.2-2
LNG Terminal Plot Plan

Public access for the above information is available only through the Public Reference Room, or by e-mail at public.referenceroom@ferc.gov.

The Corpus Christi Channel and the La Quinta Channel are operated by the Port of Corpus Christi Authority (PCCA) and maintained by the COE, which completed the existing 45-foot depth project in 1989. The COE recently conducted a study (COE, 2003) to extend the La Quinta Channel an additional 7,400 feet at a depth of 39 feet to reach the proposed PCCA La Quinta Gateway Container Terminal, located about 4.5 miles northwest of the Ingleside Energy Center LNG Terminal.

Construction of the maneuvering area would require the dredging of a 40-acre area owned by the PCCA in La Quinta Channel, to a minimum of about 43 feet below mean low tide (MLT), or 2 feet shallower than the existing channel. About 1,365,300 cubic yards of material would be dredged from the La Quinta Channel for the Ingleside Energy Center LNG Terminal maneuvering area.

The LNG ship berth would be excavated and dredged within a 19-acre upland area at the terminal site and oriented so that the LNG ship would not affect ship traffic in La Quinta Channel. It would be about 750 feet by 1,400 feet and would be dredged to a minimum depth of 43 feet below MLT and a maximum depth of 44 feet below MLT to accommodate LNG ships with storage capacities up to 250,000 m^3 of LNG per ship and drafts up to 40 feet. About 1,719,400 cubic yards of material would be removed from the proposed LNG ship berth area. Of this amount, about 320,000 cubic yards of material would be removed as dry excavation. The side slopes of the newly constructed berth would be at a 2:1 slope. The lower portion of the slopes, between 30 and 43 feet below MLT, would be in sandy layers that would be susceptible to erosion from wheel wash and bow thrusters from the LNG ship (Goldston, 2004). Erosion protection (*i.e.,* articulated concrete blocks) would be placed on the lower portion of the north slope from 5 feet below MLT to the bottom of the slope. Erosion protection would not be required on the south side of the LNG ship berth; however, if needed, other measures to protect side slopes would include installation of riprap, fabriforms, or other slope stabilization materials.

Ingleside San Patricio proposes to remove the dredged material for the marine basin and LNG ship berth using excavation equipment for the dry excavation and a cutterhead suction dredging system for the wet excavation. Ingleside San Patricio's preferred primary disposal area would be on land owned by Alcoa Inc. (Alcoa), located about 3 miles northwest of the terminal site. Should unforeseen circumstances preclude the use of Alcoa's tailing ponds, Ingleside San Patricio has identified an alternative dredged material disposal area on the PCCA's Dredged Material Placement Area (DMPA) No. 13, about 800 feet west of the terminal site. The proposed DMPA on Alcoa property was formerly used for the disposal and permanent storage of bauxite residue and related waste from refining activities at what is now known as the Sherwin Alumina Company plant.[5] See section 2.4.1.2 of this EIS for additional information on dredging and dredged material disposal.

Four breasting dolphins, consisting of steel pipe piles with concrete caps would be constructed at the LNG ship berth. The breasting dolphins would be equipped with:

- rubber fenders with steel protector panels suitable to safely berth and moor the full range of vessel sizes being considered;

[5] The alumina plant was operated from 1953 to 2000 by the Reynolds Metal Company, which is currently a subsidiary of Alcoa.

- triple 100-metric tonnes quick release mooring hooks to be installed on each breasting dolphin; and
- access catwalks to connect the breasting dolphins to the dock/unloading jetty and to the mooring structures.

Six mooring points would be provided, each consisting of steel pipes with concrete caps. Mooring dolphins would be provided with access stairs and protective handrails.

The LNG ship dock/unloading jetty would be a single-level reinforced concrete beam and slab structure supported on piles. It would be about 70 feet wide by 107 feet long and the unloading arm platform would be slightly curbed to confine LNG spillage to a common collection point. Drainage from the collection point would be via the LNG spill-collecting trough to a LNG spill impoundment basin. Figure 2.2-3 shows an artist's rendering of the proposed LNG terminal facilities, including the LNG ship berth.

2.2.1.2 LNG Ship Deliveries

The LNG terminal berth and off-loading facility would be designed to handle LNG transport ships ranging in capacity from about 71,500 m^3 up to 250,000 m^3. Ingleside San Patricio estimates that its proposed Ingleside Energy Center LNG Terminal would serve an average of about 140 LNG ships per year. However, that figure would depend upon the size of the LNG transport ships that come to dock. The most common size of LNG tankers currently in use is 138,000 m^3. Table 2.2.1.2-1 shows how the number of ships would decline if there were increases in LNG ship capacity.

TABLE 2.2.1.2-1

Number of LNG Tanker Deliveries Depending on the Size of the Ship

	Size of the LNG Tankers (Capacity in m^3)		
	138,000	**165,000**	**250,000**
Number of Dockings at LNG Terminal Per Year	323	0	0
	300	20	0
	205	100	1
	100	100	60
	50	50	120
	0	0	180

Ships that transport LNG are specially designed and constructed. LNG ship construction is highly regulated and consists of a combination of conventional ship design and equipment, with specialized materials and systems designed to safely contain liquids stored at temperatures of -260°F. The following section presents a brief overview of the main design and safety features of a typical LNG ship.

Non-Internet Public

FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE PROPOSED INGLESIDE ENERGY CENTER LNG TERMINAL AND PIPELINE PROJECT
Docket Nos. CP05-11-000, et al.

Page 2-6
Figure 2.2-3
Artist's Rendering of the LNG Terminal Facilities

Public access for the above information is available only through the Public Reference Room, or by e-mail at public.referenceroom@ferc.gov.

Profile

LNG ships have a distinctive appearance compared with other transport ships. A LNG ship has a high freeboard (*i.e.*, that portion of the ship above water) when compared with vessels such as an oil tanker, because of the comparatively low density of the cargo. Because of the high freeboard, wind velocity can adversely affect the maneuverability of the ship, particularly at slow speed, such as during docking.

Hull System

All LNG ships are constructed with double hulls while most other liquid transport ships presently in use have single-hull construction. Double-hull construction increases the structural integrity of the hull system and provides protection for the cargo tanks in case of an accident. The space between the inner and outer hulls is used for ballast water. The International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (Gas Tanker Code) and Coast Guard regulations require that LNG ships meet a Type IIG standard of subdivision, damage stability, and cargo tank location.

The Type IIG design ensures the LNG ship could withstand flooding of any two adjacent compartments without any adverse effect upon the stability of the ship. Type IIG design also requires that the cargo tanks must be a minimum of 30 inches from the outer hull and minimum distance above the bottom of the ship equal to the beam of the ship divided by 15, or 6.5 feet, whichever is less. This distance is intended to prevent damage to the cargo tanks in case of low energy-type accidents that might occur in harbors and during docking. Most large LNG ships have a distance of 10 to 15 feet between the outer hull and cargo tank.

Containment Systems

A LNG containment system on the LNG ships consists principally of the cargo tank (sometimes called a primary barrier), the secondary barrier, and insulation. The containment system also includes cargo monitoring and control and safety systems.

Three basic tank designs have been developed for LNG cargo containment: prismatic free-standing, spherical, and membrane. The earliest form of LNG containment is the prismatic free-standing tank. It consists of an aluminum alloy or 9 percent nickel steel, self-supporting tank that is supported and restrained by the hull structure. Insulation consists of reinforced polyurethane foam on the bottom and the sides, with fiberglass on the top. The spherical tank design uses an unstiffened, spherical, aluminum alloy tank that is supported at its equator by a vertical cylindrical skirt, with the bottom of the skirt integrally welded to the ship's structure. This free-standing tank is insulated with multi-layer close-cell polyurethane panels. In the membrane containment system, the ship's hull constitutes the outer tank wall, with an inner tank membrane separated by insulation. Two forms of membrane are commonly used: the Technigaz membrane using stainless steel and the Gas-Transport membrane using Invar.

LNG tankers are of the double-hulled design regardless of the containment system used. A double bottom and double sides are provided for the full length of the cargo area and arranged as ballast tanks, independent of the cargo tanks. The double-hulled design provides greatly increased reliability of cargo containment in the event of grounding and collisions. Further, the segregated ballast tanks prevent ballast water from mixing with any residue in the cargo tanks.

Pressure/Temperature Control

A basic goal of all LNG containment systems is to maintain the LNG cargo at or near atmospheric pressure at the boiling temperature of the LNG (about -260°F). This is accomplished using "auto-refrigeration," a phenomenon that results from the constant heat flow into the tank and the removal of the associated vapor.

The vapor generated during auto-refrigeration is known as boil-off. Typical boil-off rates of LNG ships range from 0.25 to 0.15 percent (by volume) per day. Currently, all LNG ships burn the boil-off as fuel. The Coast Guard does not permit routine venting of BOG to the atmosphere. Thus, all LNG ships that trade in the U.S. are fitted with an internalized combustion energy system that allows the ship's boilers to consume all of the BOG to fuel the ship's steam propulsion system. As a result, LNG ships have reduced emissions when compared with conventional oil-fired ships.

Ballast Tanks

Sufficient ballast water capacity must be provided to permit the ship to return to the loading port safely under various sea conditions (see section 4.5.1.4 for additional information on ballast water). LNG cargo tanks are not used as ballast tanks because these tanks must contain a minimal amount of LNG in them at all times, even when "empty" in order to keep the tanks cold in normal operation. Consequently, LNG ships must be designed to provide adequate ballast capacity in other locations.

Ballast water tanks of the LNG ships are arranged within the LNG ship's double hull. It is essential that ballast water not leak into the LNG containment system. To reduce the potential for leakage, the ballast tanks, cofferdams, and void spaces are typically coated to reduce corrosion. LNG ships are also periodically inspected to examine the coating and to renew it as necessary.

A ballast control system, which permits the simultaneous ballasting during cargo transfer operations, is also incorporated into each LNG ship. This allows the LNG ship to maintain a constant draft during all phases of its operation to enhance performance. Under normal operating conditions, ballast water would be taken onto the ship during LNG off-loading at the Ingleside Energy Center LNG Terminal.

Ship Safety Systems

The LNG vessels proposed for use in the Ingleside Energy Center LNG Project would have to comply with all federal and international standards regarding LNG shipping. As such, ships that transport LNG to the Ingleside Energy Center LNG Terminal would be fitted with an array of cargo monitoring and control systems. These systems would automatically monitor key cargo parameters while the ship is at sea and during the remote-control phase of cargo operations at the marine terminal.

The system includes provisions for pressure monitoring and control, temperature monitoring of the cargo tanks and surrounding ballast tanks, emergency shutdown of cargo pumps and closing of critical valves, monitoring of tank cargo levels, and gas and fire detection.

The LNG ships would be fitted with many navigation and communication systems, including:

- two separate marine radar systems, including automatic radar plotting and radio direction finders;
- LORAN-C receivers;
- echo depth finders; and
- a satellite navigation system.

All LNG ships also have redundant, independent steering control systems that are operable from the bridge or steering gear room to maintain rudder movement in case of a steering system failure.

Fire Protection

All LNG ships arriving at the Ingleside Energy Center LNG Terminal would be constructed according to structural fire protection standards contained in the International Convention for the Safety of Life at Sea (SOLAS). This would be done under the review and approval of the Coast Guard.

The ships would also be fitted with active fire protection systems that meet or exceed design parameters in Coast Guard regulations and international standards, such as the Gas Tanker Code and SOLAS, including:

- a water spray (deluge) system that covers the accommodation house and central room, and all main cargo control valves;
- a traditional firewater system that provides water to fire monitors on deck and to fire stations found throughout the ship;
- a dry powder extinguishing system for LNG fires; and
- a carbon dioxide system for protecting the machinery, ballast pump room, emergency generators, cargo compressors, etc.

Crew Qualifications and Training

All officers and crews of the LNG ships would comply with the International Convention Standards of Training, Certification and Watch Keeping for Seafarers. Key members of the crew must have specific training in the handling of LNG and the use of the safety equipment. Officers must receive simulator training in the handling of the ship and the cargo systems specific to the conditions at the project site. In addition, a local pilot from the Port would board each ship and guide it through the Corpus Christi Channel.

Ship Selection

The specific identity of LNG ships that would off-load at the Ingleside Energy Center LNG Terminal would depend on the commercial terms of the LNG purchase agreements. Transportation could be provided by either the LNG buyer or supplier. The different contractual arrangements for LNG transport can result in ships of different sizes and countries of origin being used to transport LNG to the LNG terminal.

Table 2.2.1.2-2 shows the relative dimensions of two of the larger LNG ships that could be used to transport LNG to the Ingleside Energy Center LNG Terminal: 125,000 m^3 cargo capacity typical of ships presently in service; and 165,000 m^3 potential cargo capacity of future ships.

TABLE 2.2.1.2-2

Typical LNG Ship Characteristics

Specifications	Existing Ships	Future Ships
Capacity	125,000 m^3	165,000 m^3
Length	950 feet	1,000 feet
Beam	145 feet	150 feet
Loaded Draft	38 feet	40 feet
Hull Depth	82 feet	100 feet
Loaded Displacement	95,000 Long Tons	122,000 Long Tons

Ships arriving at the Ingleside Energy Center LNG Terminal would comply with the Coast Guard regulations for LNG ships. This compliance is demonstrated by the operator of the LNG ship having proper certificates authorizing the transport of LNG as follows:

- U.S. Flag LNG Ship – The Coast Guard Certificate of Inspection must be valid and endorsed for the ship to transport LNG (46 CFR 154, 1979).
- Foreign Flag LNG Ship – The ship must have a valid Certificate of Compliance issued by the Coast Guard. The certificate is issued after the ship has proved that it complies with the Coast Guard regulations and after it has been satisfactorily inspected by a Coast Guard Marine Safety Office (46 CFR 154, 1979).

Both U.S. and foreign flag ships must be inspected annually by the Coast Guard and the flag state. A Coast Guard Certificate of Inspection is required every two years. Coast Guard officers from the Marine Safety Unit, Corpus Christi, Texas, may board the LNG ships arriving in the Channel to ensure safety standards are met. Ingleside San Patricio would continually monitor ship operations to ensure that the operations are according to their established procedures and to ensure that the ships are maintained to all standards.

2.2.1.3 LNG Unloading and Transfer Lines

Onboard ship pumps would deliver the LNG to the storage tanks. The dock/unloading jetty would have an unloading arm platform containing four, 16-inch-diameter 304 L stainless steel arms of equal length. Three of the arms would be unloading arms used for liquid transfer to the storage tank and the fourth arm would be for vapor return to the LNG ship. Each arm would be designed up to a pressure of 225 pounds per square inch gauge (psig), with a capacity of 4,000 m^3 per hour for LNG and 12,000 m^3 per hour for vapor. The arms could handle LNG ships ranging from 75,000 m^3 to 250,000 m^3 in size.

Each of the arms would be operated by a hydraulic system and mounted on individual risers to support the entire weight of the arm. The arms would be designed with swivel joints for the required range of movement between the dock and the LNG ship and would be suitable for cryogenic service. A counter-balance system would be installed in each arm to reduce loads on the ship flanges. Each arm would be equipped with powered emergency release coupling (PERC) valves to protect the arm and the ship and minimize spillage of its liquid content during an emergency disconnect.

The unloading arms would be connected to a single 36-inch-diameter stainless-steel insulated LNG transfer line from the dock/jetty platform. This line would run along the main pipe rack to transfer the LNG into the LNG storage tanks. The LNG transfer line would range in length from approximately 1,100 to 1,550 feet and would be placed on aboveground structural pipe racks.

Ingleside San Patricio would design these facilities in accordance with applicable codes and standards, including but not limited to Oil Companies International Marine Forum, Society of International Gas Tanker and Terminal Operators, American Petroleum Institute (API), and American Society of Civil Engineers. The facilities would be designed to provide safe berthing for the receipt and mooring of LNG ships and to ensure safe transfer of LNG cargoes from the ships to the LNG storage tanks.

2.2.1.4 LNG Storage Tanks

The transfer lines would transport the LNG to the two, 160,000 m^3 double-containment storage tanks at a maximum internal pressure of 2.5 psig (see figure 2.2-4). The storage tank design includes a double-wall LNG storage tank that would be surrounded by a free-standing pre-stressed concrete containment wall to the height of the LNG storage tank eave height (about 137 feet). The concrete containment wall would be on the same reinforced concrete slab foundation as the LNG storage tank and separated with an inner space.

Each LNG storage tank would consist of a 9 percent nickel inner tank that would contain the LNG. An outer tank of carbon steel would surround the inner tank. The space between the inner and outer tank would be insulated with expanded perlite to allow the LNG to be stored at temperatures of -270°F. A carbon steel domed roof would be constructed over the outer tank and an insulated aluminum deck over the inner tank would be suspended from the roof. Each tank would be about 253 feet in diameter (outer tank dimension) and 178 feet high (top of roof dome). The insulation beneath the inner tank would be cellular glass, load-bearing insulation that would support the weight of the inner tank and the LNG.

All piping connections into and out of the LNG storage tanks would be from the top so that there would be no penetrations of the tank bottom or sides. Four in-tank pump columns would be installed in each of the LNG storage tanks, three would contain pumps and one would be a spare. The in-tank pumps would transfer the LNG from the LNG storage tanks to LNG sendout pumps. Each in-tank pump would be designed to handle up to 4,756 gpm. Three operating in-tank pumps would be required to obtain the annual sendout rate of 1.0 bcfd.

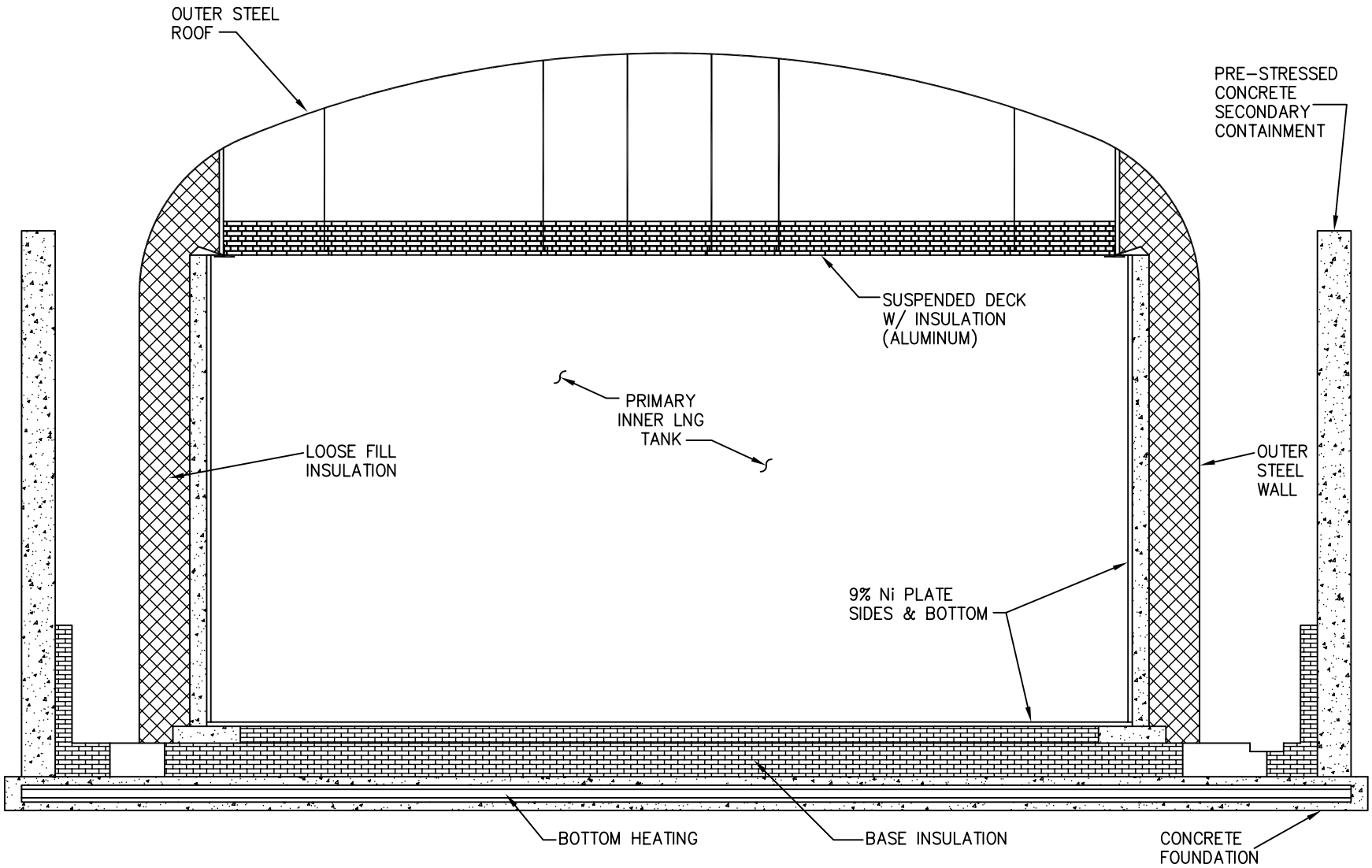

Figure 2.2-4

Ingleside Energy Center LNG Project
Typical Double Containment Storage Tank

CADDFILE: INGL2905-A002.dwg

2.2.1.5 Vaporization System

LNG from the LNG storage tanks would be pressurized to 1,400 psig by six high-pressure sendout pumps, each capable of discharging 1,950 gpm, and then vaporized so that natural gas could be sent out via the proposed natural gas pipeline. The pressurized LNG would be vaporized in eight STV. One vaporizer would be set aside as a spare.

This process would involve warming the LNG and converting it back to a gaseous state and using heated wastewater from Occidental Chemical's and/or ICLP's cooling water system as a source of vaporization heat for the LNG. The LNG from the sendout pumps would enter the vaporizer tubes. A 30 percent by weight ethylene glycol/water mixture (intermediate fluid) would be circulated over the tubes containing the LNG and warming it to a gaseous state for sendout to the pipeline system. As the heated wastewater circulates over the STV, it would be cooled by the LNG. Cooled water would be returned to the Occidental Chemical and/or ICLP facility for reuse. This process would reduce water consumption at the Occidental Chemical manufacturing complex by about two million gallons per day. In addition, integration of the LNG terminal with Occidental Chemical's facility would conserve about 16,000 million cubic feet of natural gas per day that would otherwise be burned to generate heat for the vaporization process. This would avoid the release of about 300 tons of regulated air emissions per year.

After leaving the vaporizers, the high pressure gas would be metered and odorized prior to discharge into the sendout pipelines. An interior plant pipe would connect the vaporization system to metering facilities that would measure the total natural gas output of the Project. Under normal operations, the terminal would have an average total output of 1.0 bcfd.

2.2.1.6 Vapor Handling System

During normal operations, ambient heat input into the LNG storage tanks and piping system would cause a small amount of LNG to be continuously vaporized, referred to as BOG. Some vaporization of LNG would also be caused by other factors such as barometric pressure changes, heat input due to pumping, and ship flash vapor.

During LNG ship unloading, a portion of the BOG would be returned to the LNG ship to compensate for the volume of liquid pumped out of the LNG ship into the storage tanks. To accomplish this, the BOG would be routed to two vapor return blowers that would increase the BOG pressure to about 10 psig. BOG exiting the vapor return blowers would enter a pressure control valve that allows sufficient BOG to enter the LNG ship. Any excess BOG would be routed to the BOG compressor where it would be compressed to about 100 psig. This high-pressure BOG would then be routed to a condenser drum where it would be condensed to a liquid and blended into the LNG sendout.

Each of the LNG storage tanks would be connected to a low-pressure flare system and utility gas system via a 30-inch BOG line. Under normal conditions, isolation valves on the BOG lines would be opened to ensure that each of the storage tanks is operating at equal pressures. A pressure transmitter in the BOG header would monitor this pressure. As vapors are generated or released within the storage tanks, the pressure in the BOG header would rise causing the pressure controller to load the BOG compressor. If pressure within the storage tanks continues to rise, a separate pressure transmitter/controller would open a pressure control valve and send

the excess gas to a totally enclosed ground flare system. An elevated flare would handle any additional releases should the ground flare system be exceeded. Conversely, if the BOG header pressure decreases, the BOG compressor would be unloaded to reduce the BOG removal rate and a second pressure controller would open a second pressure control valve to allow vacuum breaker gas from the utility gas system to enter the storage tank and maintain proper pressure.

2.2.1.7 Utilities and Support Facilities

Support facilities located within the terminal include a control building, main firewater pump house, backup firewater pump shelter, jetty control building, compressor enclosure, substation building, and structural pipe racks.

2.2.2 Pipeline Facilities

The natural gas pipeline facilities proposed by Ingleside San Patricio would consist of approximately 26.4 miles of steel, 26-inch-diameter high-pressure pipeline, extending underground from Ingleside San Patricio's proposed LNG terminal to north of Sinton, Texas. The pipeline would be capable of transporting about 1.0 bcfd of natural gas at a design pressure of 1,440 psig. The pipeline would allow Ingleside San Patricio to transport natural gas from its LNG terminal to intrastate and interstate markets, via interconnections with nine existing pipeline systems. Ingleside San Patricio would construct a meter station at each of the pipeline interconnect/delivery points. Table 2.2.2-1 lists each of the proposed pipeline interconnect/ delivery points and the associated meter station. Detailed maps of the pipeline route and meter station locations are provided in appendix C.

TABLE 2.2.2-1

Proposed Delivery Points and Meter Station Locations

Interconnection/Delivery Points	Pipeline Milepost	Average Daily Flow Rate (MMcfd)
Texas Eastern Transmission Company	12.5	350,000
Channel Pipeline Company	18.3	500,000
GulfTerra Pipeline Company a/	19.7	300,000
CrossTex Pipeline Company a/	19.7	100,000
Kinder Morgan Texas Pipeline Company, Tejas Pipeline	24.3	800,000
Gulf South Pipeline Company, L.P.	25.5	235,000
Natural Gas Pipeline Company of America	25.7	950,000
Transcontinental Gas Pipeline Corporation	26.1	250,000
Tennessee Gas Pipeline Company	26.3	855,000

a/ GulfTerra Pipeline Company collocated with CrossTex Pipeline Company.

In addition to the eight meter stations, Ingleside San Patricio would construct aboveground facilities at the start and end points and approximate midpoint of the pipeline, as listed below:

- pig[6] launcher facility, tie-in valves, and the San Patricio meter station at pipeline milepost (MP) 0.0 within the proposed LNG terminal;
- MLV collocated with the Texas Eastern Transmission Company (Tetco) meter station near the mid-point of the pipeline at MP 12.5; and
- pig receiver facility collocated with the Tennessee Gas Pipeline Company (Tennessee) meter station at the northern pipeline terminus at MP 26.3.

2.3 LAND REQUIREMENTS

2.3.1 LNG Terminal Facilities

Construction of the proposed LNG terminal would require about 74 acres of land, not including about 40 acres offshore within the La Quinta Channel for the maneuvering area. Table 2.3.1-1 summarizes the land requirements for the proposed LNG terminal. Access to the LNG terminal would be by way of State Route 361 and the existing access road for the Occidental Chemical manufacturing complex.

TABLE 2.3.1-1

Summary of Land Requirements for Proposed LNG Terminal Facilities

Facility/Use		Land Affected During Construction (acres)	Land Affected During Operation (acres)
LNG Terminal			
Offshore Maneuvering Area a/		40.0	40.0
Land-based Facilities including Ship Berth b/		74.0	74.0
	Total	**114.0**	**114.0**

a/ Acreage for operation includes dredged area located within state/federal waters.
b/ Area within terminal operating limits, including: storage tanks (1.3 acres); process area (4.6 acres); LNG transfer lines and pipe racks (2.0 acres); electric substation (0.7 acre); Ingleside Energy Center complex (46.4 acres); ship berth to be excavated (19.0 acres); and exclusion zones.

2.3.2 Pipeline Facilities

Construction of the proposed pipeline and related facilities would disturb about 375.7 acres of land, including the construction right-of-way for the 26-inch-diameter main pipeline, additional temporary workspaces, a contractor and pipe yard, MLV, metering stations/interconnects, pig launcher and receiver, and access roads.

Operation of the new facilities would require about 159.7 acres for the permanent easement along the 26-inch-diameter pipeline and 1.0 acre at the aboveground facilities. After construction the temporary right-of-way would be restored to its previous condition and use. The land required for operation of aboveground facilities would be fenced and maintained by Ingleside San Patricio. Table 2.3.2-1 summarizes the land requirements for proposed pipeline facilities.

[6] Pigs are tools that are used inside the pipeline for clearing and inspecting the pipe.

TABLE 2.3.2-1

Summary of Land Requirements for Proposed Pipeline Facilities

Facility	Land Affected During Construction (acres)	Land Affected During Operation (acres)
Pipeline		
Pipeline Right-of-Way	323.6 a/	159.7
Additional Temporary Extra Workspaces	14.1	0
Contractor and Pipe Yard	6.9	0
Access Roads b/	29.0	0
Subtotal	**373.6**	**159.7**
Aboveground Facilities		
Meter Stations c/	1.9	1.0
Pig Launcher, Tie-in Valves, and San Patricio Meter Station at MP 0.0 d/	0.2	0.2
Subtotal	**2.1**	**1.2**
Total e/	**375.7**	**160.9**

a/ Includes nominal 100-foot-wide construction right-of-way.
b/ All access roads are existing.
c/ Also includes pig receiver that would be collocated with the Tennessee meter station at MP 26.3.
d/ Facilities would be within the fence line of the LNG terminal. MLV at MP 12.5 would be collocated with the Tetco meter station.
e/ Some calculations may appear to be incorrect due to the effects of rounding.

2.3.2.1 Pipeline Right-of-Way and Temporary Extra Workspaces

Ingleside San Patricio would construct the 26-inch-diameter sendout pipeline within a 100-foot-wide construction right-of-way, of which 50 feet would be retained for permanent pipeline easement and 50 feet would be temporary workspace. Figures 2.3-1 and 2.3-2 show typical right-of-way cross-sections for this pipeline paralleling roads and existing pipelines, respectively. Additional temporary workspace of varying dimensions, located adjacent to the construction right-of-way, would be required at about 31 locations, primarily at crossings of existing utilities, roads, and waterbodies. Locations of additional temporary workspaces are listed in table D-1 in appendix D.

Approximately 22.9 miles of the route for the 26-inch-diameter pipeline would be immediately adjacent to existing rights-of-way. Construction of the pipeline would not result in overlap of existing easements. Table 2.3.2.1-1 lists locations where the pipeline would parallel existing rights-of-way. Where the pipeline would be directly adjacent to an existing pipeline, the new pipeline would be offset about 50 feet from the existing utility.

2.3.2.2 Aboveground Facilities

Aboveground facilities associated with the proposed pipeline would include meter stations, a MLV, a pig launcher, and a pig receiver (see section 2.2.2 above). Table 2.3.2-1 lists land requirements for these proposed aboveground facilities. A typical interconnect/delivery point meter station for this Project would be about 50 feet by 100 feet in size, requiring about 0.2 acre for construction and about 0.1 acre for operation. The exception would be the Kinder Morgan Texas Pipeline Company-Tejas Pipeline (Kinder Morgan-Tejas) meter station that would be about 50 feet by 150 feet in size, requiring about 0.2 acre for construction and operation.

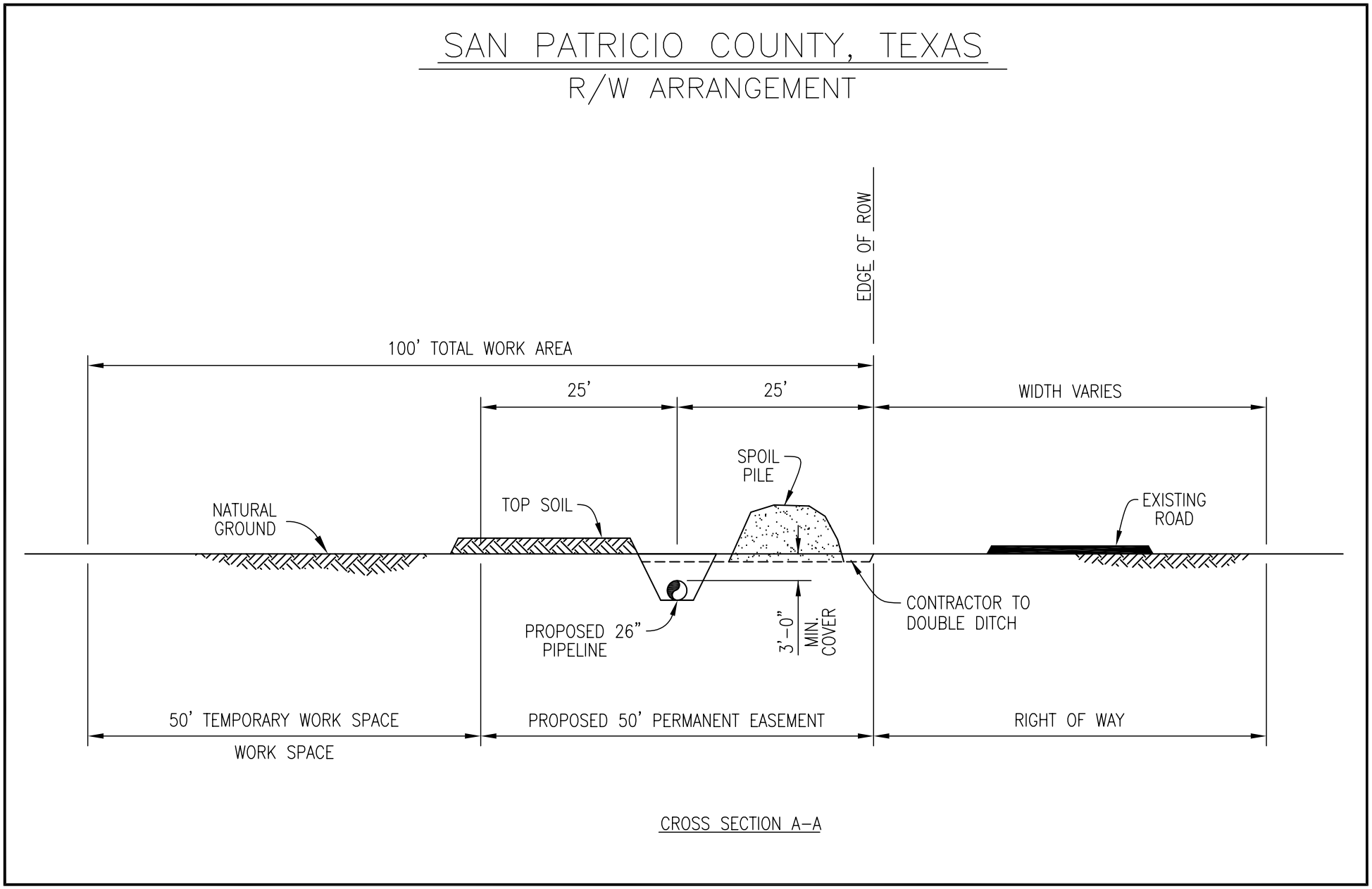

Figure 2.3-1

Ingleside Energy Center LNG Project
Typical Right-of-Way Cross Section Paralleling Roads

CADDFILE: INGL2905-004.DWG

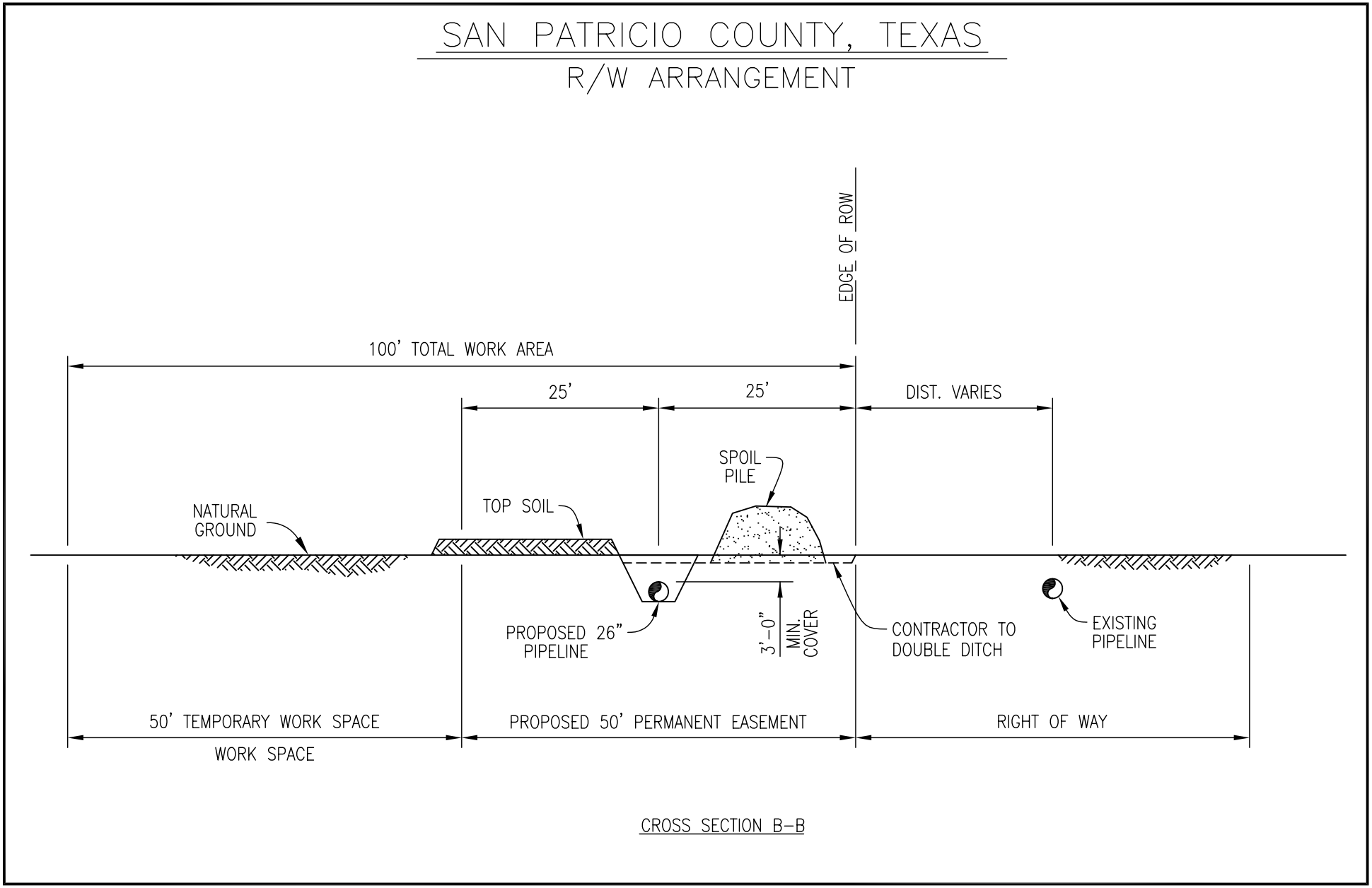

Figure 2.3-2

Ingleside Energy Center LNG Project
Typical Right-of-Way Cross Section Paralleling Existing Pipeline

CADDFILE: INGL2905-005.DWG

TABLE 2.3.2.1-1 **Locations Where the San Patricio Pipeline Would Parallel Existing Rights-of-Way**			
Mileposts	**Segment Length (miles)**	**Existing Easement**	**Direction from Existing Right-of-Way**
0.0 – 1.7	1.7	Plant Road and Railroad Spur	Adjacent to the east side of the road and spur.
1.7 – 4.7	3.0	Pipelines	Adjacent to the west side of the pipelines.
4.9 – 5.3	0.4	County Road 918-1 and Powerline	Adjacent to the south side of the road and powerline.
5.5 – 6.3	0.8	County Road 106/1722	Adjacent to northeast side of the road.
6.3 – 8.4	2.1	County Road 106/1722 and Pipelines	Adjacent to north side of the road and pipelines.
8.4 – 12.6	4.2	Pipelines	Adjacent to the north and east side of the pipelines.
15.1 – 15.7	0.6	Powerline	Adjacent to the south side of the powerline.
15.7 – 19.2	3.5	County Road 100/1178 and Powerline	Adjacent to the south side of the road and powerline.
19.8 – 25.6	5.8	Pipelines	Adjacent to the north and east side of the pipelines.
25.6 – 26.4	0.8	Field Road	Adjacent to the south side of the road.
Total Miles	**22.9**		

The pig launcher and tie-in valves at MP 0.0 would be located at the San Patricio meter station within the proposed LNG terminal. It would be situated about 1.7 miles south of State Route 361 and require about 0.2 acre for construction and operation. The Tetco meter station would be collocated with a MLV at MP 12.5. A pig receiver facility would be collocated with the Tennessee meter station at the northern pipeline terminus at MP 26.3. The meter stations would be situated within the permanent easement for the pipeline right-of-way.

2.3.2.3 Access Roads and Contractor Yard

Ingleside San Patricio would use seven existing access roads related to its proposed pipeline facilities of which six would require improvement (see table 2.3.2.3-1). Road improvements would take place within the existing road footprint and be located in agricultural, pasture, and range land. No wetland or waterbodies would be impacted due to road improvements. Six of these roads would be retained for permanent access while one road would only be temporarily used during construction of the pipeline. No new permanent roads would be constructed for this Project. A total of about 29 acres would be required for the access roads.

Ingleside San Patricio has identified one proposed pipe storage and contractor warehouse yard, a 6.9-acre tract of open land at MP 1.6. This tract would only be used temporarily during construction of the Project.

TABLE 2.3.2.3-1

Access Roads Associated with the Proposed Pipeline

Milepost	Road Name/ Destination	New/ Existing	Permanent/ Temporary	Acres Affected
2.2	Unnamed Agriculture Road to Right-of-Way.	Existing	Permanent	1.0
2.5	Unnamed Agriculture Road to Right-of-Way.	Existing	Permanent	1.0
19.9	Unnamed Agriculture Road to GulfTerra/CrossTex Meter Station.	Existing	Permanent	0.2
20.3 and 21.1	Unnamed Pasture Road to Right-of-Way (road loops).	Existing	Permanent	3.4
22.1	Marathon Road to Right-of-Way.	Existing	Permanent	6.9
24.8	Unnamed Pasture Road to Right-of-Way.	Existing	Temporary	4.8
25.8	Unnamed Agriculture Road to Right-of-Way.	Existing	Permanent	11.7

Note: Ingleside San Patricio proposes to improve all access roads, except Marathon Road.

2.4 CONSTRUCTION PROCEDURES

This section describes the general construction procedure proposed by Ingleside San Patricio for construction of the LNG terminal and pipeline facilities. Section 4.0 of this EIS contains more detailed discussions of proposed construction and restoration procedures as well as additional measures that we are recommending to mitigate environmental impacts.

The Project LNG terminal and pipeline facilities would be designed, constructed, operated, and maintained in accordance with federal standards that are intended to adequately protect the public by preventing or mitigating LNG and natural gas pipeline failures or accidents, and ensure safe operation of the facilities.

Under provisions of the Natural Gas Pipeline Safety Act of 1968, as amended, Ingleside San Patricio would design, construct, operate, and maintain the LNG terminal facilities in accordance with the DOT's "Federal Safety Standards for Liquefied Natural Gas Facilities" at 49 Code of Federal Regulation (CFR) 193 and the National Fire Protection Association's (NFPA) "Standards for the Production, Storage, and Handling of LNG" (NFPA 59A). These standards specify siting, design, construction, equipment, and fire protection requirements for new LNG facilities. The LNG ship unloading facilities and any appurtenances located between the LNG ship and the last valve immediately before the LNG storage tank would comply with the applicable sections of the Coast Guard regulations for "Waterfront Facilities Handling LNG" at 33 CFR 127 and Executive Order 10173.

The proposed pipeline facilities would be designed, constructed, operated, and maintained in accordance with the DOT regulations at 49 CFR 192, *Transportation of Natural or Other Gas by Pipeline: Minimum Federal Safety Standards*. Among other items, these regulations specify material selection; design criteria; corrosion protection; and qualification for welders and operation personnel. In addition, Ingleside San Patricio would comply with the Commission's regulations at 18 CFR 380.15, regarding the siting and maintenance of pipeline rights-of-way.

Ingleside San Patricio would construct the Project facilities in accordance with the FERC's *Upland, Erosion Control, Revegetation and Maintenance Plan* (Plan) and *Wetland and Waterbody Construction and Mitigation Procedures* (Procedures). The FERC's Plan and Procedures are available for viewing on the FERC Internet website at www.ferc.gov.

Ingleside San Patricio would be required to develop onshore and offshore Spill Prevention, Control and Countermeasures Plans (SPCC Plans) to be implemented during construction of the facilities. The SPCC Plans must address potential spills of fuel, lubricants, and other hazardous materials and describe spill prevention practices, spill handling and emergency notification procedures, and training requirements.

2.4.1 LNG Terminal Facilities

Ingleside San Patricio considered the following factors during site selection and design of the LNG terminal facilities, in accordance with 49 CFR 193 Subpart B and NFPA 59A (both 1996 and 2001 versions):

- thermal radiation protection and separation of facilities;
- seismic forces and soil characteristics; and
- wind forces and other severe natural conditions.

Construction of the LNG terminal facilities would include the removal and relocation of Occidental Chemical's existing loading dock and chemical storage tank (see section 2.10.1), site preparation, activities associated with excavation for the ship unloading facility and dredging for the maneuvering area, construction of the LNG storage tanks, and vaporization facilities. Other associated activities include construction of a 12-inch-diameter gas pipeline and two meter stations and replacement of an existing wooden cooling tower, owned by Occidental Chemical (see sections 2.10.3 and 2.10.4, respectively).

2.4.1.1 Site Preparation

Before beginning work, the LNG terminal site and portions of Occidental Chemical's site would be divided into areas by Ingleside San Patricio and/or the major contractors or subcontractors for construction support offices, warehousing, temporary access roads, material laydown storage, construction equipment parking, and parking lots for workers. Ingleside San Patricio would obtain concrete from a local concrete supply company; however, an on-site concrete batch plant may be considered to facilitate construction. Minimal clearing, grubbing, and backfilling would be required to prepare the construction site for these temporary facilities. Materials needed for the marine facilities would be delivered to the project site and constructed from working marine barges. All other required materials would be transported to the site via truck or rail.

Existing access roads including State Route 361 and those at the Occidental Chemical manufacturing complex would be used during construction.

2.4.1.2 Marine Terminal Basin Dredging and Dredged Material Placement Areas

The marine basin would be dredged to a minimum depth of 43 feet below MLT and a maximum depth of 44 feet below MLT. Based on a geotechnical survey conducted by Ingleside San

Patricio, about 1,365,300 cubic yards of material would be dredged for the maneuvering area and about 1,719,400 cubic yards of material would be removed for the LNG ship berth. Of the material that would be removed for the LNG ship berth, about 320,000 cubic yards of material would be removed as dry excavation. The maneuvering area would be centered on the La Quinta Channel and be about 1,460 feet in diameter while the LNG ship berth would be perpendicular to the La Quinta Channel. Ingleside San Patricio's dredging contractor would conduct pre- and post-dredging surveys to determine actual quantities.

Ingleside San Patricio proposes to remove the dredged material for the marine basin using excavation equipment for the dry excavation. A cutterhead suction dredging system would be used for the wet excavation. Working off of a dredge barge, a rotating cutter would displace the basin sediments, which would then be suctioned into a pipeline attached to the cutterhead. The depth of the cut would be controlled by lowering the cutterhead. A centrifugal pump would move the slurry (a combination of sea water and bottom sediments sucked up from the dredge cutterhead) through the pipeline. Typically for a dredging project of this size, a 20- to 30-inch-diameter pipeline would be used for the dredge. The slurry would be transported through a discharge pipeline to the disposal areas. Depending on the length of the discharge pipeline, a booster pump may be used.

Ingleside San Patricio's preferred DMPA for its dredged material would be at Alcoa's bauxite residue tailing ponds. Alcoa's tailing ponds are 119, 385, and 188 acres in size, and were formerly used for the disposal and permanent storage of bauxite residue and related waste from refining activities at the Sherwin Alumina Company plant. Should unforeseen circumstances preclude the use of Alcoa's tailing ponds, Ingleside San Patricio has identified the PCCA's DMPA No. 13 as an alternative disposal area. However, use of DMPA No. 13 would not proceed without a determination from the PCCA and the COE that adequate capacity exists at this location to accommodate the maintenance work required in Corpus Christi Bay and dredged material from other area projects. The PCCA's DMPA is located about 800 feet west of the LNG terminal site and consists of a 600-acre spoil bank that was created by dredged material from other area projects (see figure 2.4-1).

Upon finalization of the DMPA site, Ingleside San Patricio would consult and comply with the applicable permitting agencies and their requirements. Ingleside San Patricio would also develop a Dredge Disposal Plan (DDP), which would include an assessment of the DMPA and impacts that may occur from transporting the material from the dredge location to the DMPA. Upon completion, the DDP would be filed with the Commission. Ingleside San Patricio would work with Alcoa and/or the PCCA as well as the applicable agencies to determine the specific improvements that would be necessary at the DMPAs to handle the dredged spoil, such as raising the height of the existing earthen levees to accommodate dredged spoil. In addition, **we recommend that:**

- **Ingleside San Patricio should include in its Dredge Disposal Plan the final placement location, the routes of dredge slurry pipes and access roads, and the location/design of outfall structures. This plan should be filed with the Secretary of the Commission (Secretary) <u>prior to the start of dredging operations</u>.**

Non-Internet Public

FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE PROPOSED INGLESIDE ENERGY CENTER LNG TERMINAL AND PIPELINE PROJECT
Docket Nos. CP05-11-000, et al.

Page 2-23
Figure 2.4-1
Dredged Material Placement Areas

Public access for the above information is available only through the Public Reference Room, or by e-mail at public.referenceroom@ferc.gov.

2.4.1.3 LNG Ship Unloading and Transfer Facilities

The LNG ship unloading facilities would consist of a LNG dock/jetty platform that is equipped with a mooring system and appurtenant facilities. The LNG dock/jetty platform would be constructed using a reinforced concrete beam structure supported on pre-cast concrete piles and connected to the shore by a trestle. The finished jetty head platform would be about 70 feet wide and 107 feet long. It is expected that the unloading facilities would be constructed using steel-pipe pilings, concrete, and reinforcing steel and would be fabricated from working barges in the dredged LNG ship berth area. The dock/jetty platform would be at an elevation of 20 feet above MLT to support the unloading arms, allow for LNG ship access, and unload piping and controls.

2.4.1.4 LNG Storage and Vaporization Facilities

The most labor-intensive and time-consuming activity would be the construction of the two LNG storage tanks. After the reinforced concrete slab foundation is installed with heating coil conduits, to prevent frost heave of the subsoil, tank construction would consist of the following sequential steps:

- construction of the outer steel tank, steel floating roof, and suspended deck;
- installation of a pre-fabricated compression ring;
- raising of the roof and suspended deck and welding of the compression ring;
- installation of the inner tank that includes the bottom liner, inner concrete base, foam glass, dry sand, and secondary annular;
- installation of the inner vertical wall and outer concrete containment wall;
- installation of top steel platform on roof plate;
- installation of corner protection in the annular space between the concrete containment wall and outer steel wall;
- installation of pipe racks and pump columns;
- hydrostatic and pneumatic testing; and
- inert the tank with nickel gas.

The storage tanks would be hydrostatically tested in accordance with API Standard 620, Appendix Q.8. API Standard 620 deals with the design and construction of large, welded, field-erected low-pressure carbon steel aboveground storage tanks (including flat-bottom tanks) with a single vertical axis of revolution, and Appendix Q deals with low-pressure storage tanks for liquefied hydrocarbon gases at temperatures not lower than -270°F (Techstreet, 2004). Hydrostatic testing of each tank would involve filling the inner tank with approximately 28 million gallons of fresh water. The tank would be filled and emptied as quickly as possible. At the maximum level calculated, the water would be maintained for at least 48 hours for inspection. After testing, the tanks would be cleaned with fresh water and dried. Test water would be obtained from and discharged to the Occidental Chemical manufacturing complex. See section 4.3.2.3 of this EIS for further information on hydrostatic testing.

Construction of other necessary facilities and buildings, as well as foundations and major equipment such as vaporization units and other major mechanical equipment would commence once construction of the LNG storage tanks has begun. Emphasis would be placed on coordinating the arrival of the major equipment with the completion and curing of the respective foundations so that the equipment can be placed on its foundation when it arrives. The process pipeline would be pre-fabricated and brought to the Project site for installation while the concrete structures would be pre-fabricated on-site or poured in place. Ancillary systems such as the control room, electrical substation, and firewater, utility, and safety systems would be constructed in a sequence to enable the facilities to be tested, pre-commissioned, and inspected prior to the completion and commissioning of the LNG storage tanks.

2.4.2 Pipeline and Associated Aboveground Facilities

2.4.2.1 General Pipeline Construction Procedures

Figure 2.4-2 shows the typical steps of cross-country pipeline construction. Standard pipeline construction proceeds in a manner of an outdoor assembly line composed of specific activities that make up the linear construction sequence. These operations collectively include survey and staking of the right-of-way, clearing and grading, trenching, pipe stringing and bending, welding and coating, lowering-in and backfilling, hydrostatic testing, and cleanup. In addition to standard pipeline construction, Ingleside San Patricio would use special construction techniques where warranted by site-specific conditions. These special techniques would be used when constructing across waterbodies, wetlands, agricultural areas, and roads.

Survey and Staking

Before the start of construction, Ingleside San Patricio would finalize surveys and stake the centerline and exterior boundaries of the construction right-of-way. The exterior boundary would mark the limit of approved disturbance areas and would be maintained throughout the construction period. Utility lines would be located and marked to prevent accidental damage during pipeline construction, and any special agricultural drainages would be noted. During this period, equipment involved in pipeline construction would be moved onto the right-of-way using existing roads for access.

Clearing and Grading

Initial clearing operations would include the removal of vegetation within the construction right-of-way and temporary construction workspace either by mechanical means (using equipment such as a brush hog) or hand-cutting. The right-of-way limits would be identified and flagged in the field prior to clearing. Flat grassy areas would be mowed. In upland portions of the right-of-way, tree stumps would be removed to create a flat and safe travel lane. Tree stumps and rootstock would be left in the temporary workspace wherever possible to encourage natural revegetation. Brush and timber would be stockpiled at the edge of the right-of-way, or hauled off-site, in accordance with the property owner's wishes.

During clearing, temporary gated fences would be installed where necessary for livestock control and security. Temporary entries of clean rock over geotextile fabric would be installed for access to the right-of-way from roads.

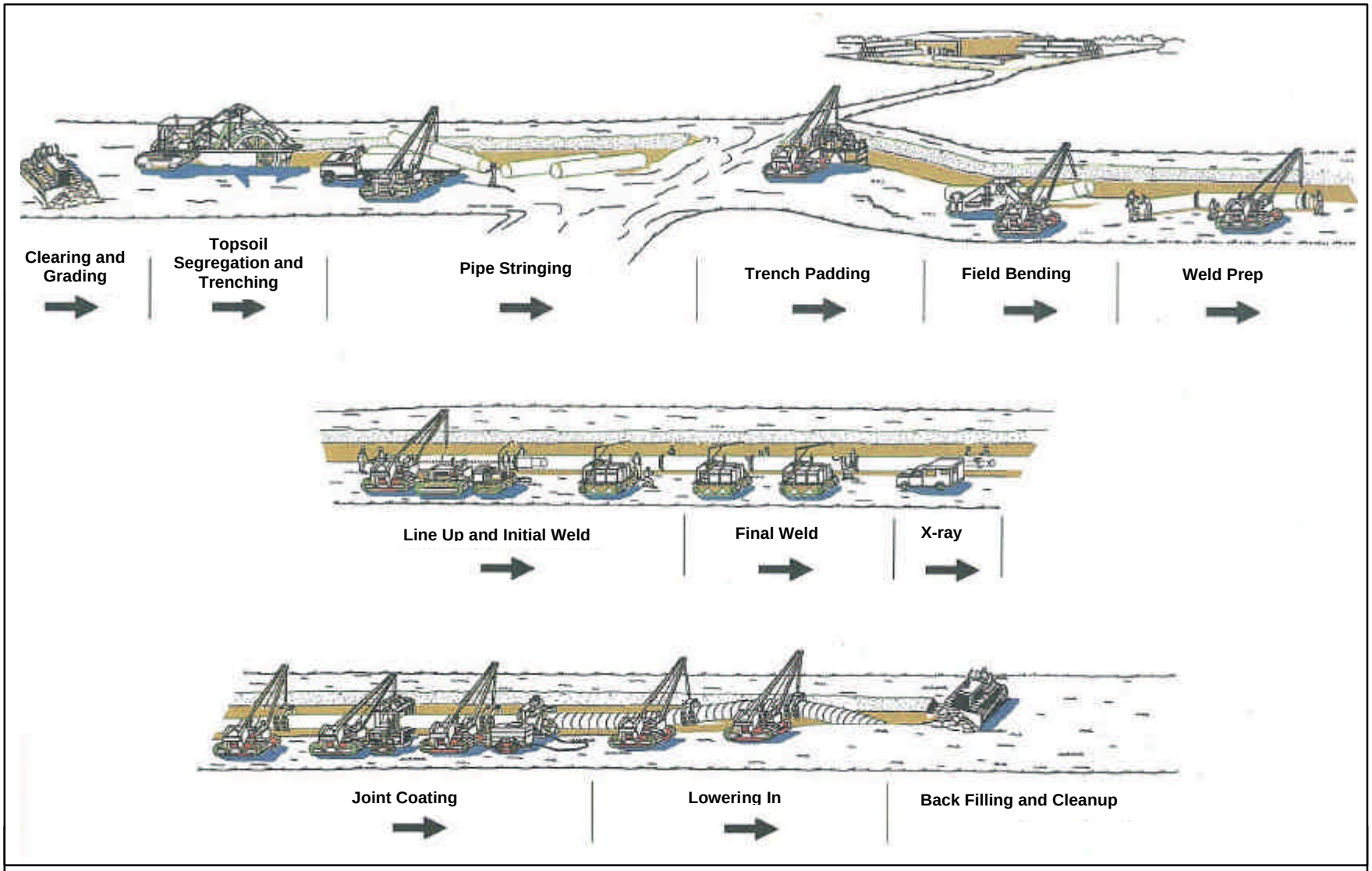

Figure 2.4-2
Ingleside Energy Center LNG Project
Typical Pipeline Construction Sequence

Following clearing, the construction right-of-way and additional temporary workspace would be rough graded as necessary to allow for safe passage of equipment and to prepare a relatively level work surface for pipeline construction. Bulldozers equipped with ripper and grading blades would perform grading activities. Because the area is basically flat, little grading is anticipated. Closely following initial disturbance of the soil, erosion controls would be installed at the required locations (see section 4.2). Temporary bridges and culverts would be established for creek and drainage ditch crossings.

Trenching

The pipeline ditch would be excavated with either a wheel-trencher or a backhoe. Typically, the trench would be between 5 to 7 feet deep (for a minimum of 3 feet of cover over the pipe) and between 10 to 35 feet wide. Topsoil would be segregated from subsoil, and windrowed on the spoil side of the construction right-of-way. Based on available data, no bedrock would be encountered within the trench depth and no blasting would be required to excavate the trench. Temporary barriers, know as “trench plugs,” would be installed at certain distances within the ditch.

Pipe Stringing, Bending, and Welding

After trenching, the pipe would be strung along the right-of-way and placed up on wooden pedestals known as “skids.” Pipe would be trucked to the right-of-way from the contractor yard at MP 1.6, and off-loaded using side-booms. A hydraulic bending machine would be used in the field to bend individual sections of pipe where necessary to fit the contours of the trench. About 40-foot-long segments of pipe, known as “joints,” would be welded together. All welds would be x-rayed to ensure structural integrity and compliance with the requirements established by the DOT and the API Standard 1104.

Lowering-In and Backfilling

The trench would be dewatered, cleaned of debris, and padded as necessary before the pipeline is lowered into the trench. Ingleside San Patricio construction contractor would use a padding machine to dump rock-free subsoil or sand (but not topsoil) into the bottom of the trench. Side-booms would be used to lower in the pipe. Permanent trench breakers would then be installed where necessary within the ditch, such as at the base of slopes. The trench would be backfilled first using stored subsoil, then the topsoil. Excess rock would be removed from the top 12 inches of topsoil. Heavy equipment would be used to compact the backfill, and a crown of soil would be left over the pipeline to account for settling. After the trench is backfilled, the pipeline would be cleaned of any internal dirt, water, or debris by pipeline "pigs" that are propelled through the pipeline by air pressure.

Hydrostatic Testing

After backfill and cleaning, the pipeline would be hydrostatically tested in one segment, using approximately 3.5 million gallons of water for the entire pipeline. The sections of pipe that were installed using the horizontal directional drill (HDD) method would be tested separately to ensure the integrity of the HDD segment. Of the 3.5 million gallons, about 246,784 gallons would be used to test each HDD segment. The test water would be obtained from Occidental Chemical’s existing firewater system. The testing process involves filling a segment of the

pipeline with water and maintaining a prescribed pressure for a specified amount of time. If a leak or break in the line were to occur during testing, Ingleside San Patricio would repair and retest that section of pipe until the DOT specifications are met. After testing is completed, the water would typically be discharged in an upland area through hay bale filtering devices. Ingleside San Patricio may also discharge water into Occidental Chemical's existing stormwater system. Hydrostatic testing is also addressed in section 4.3.2.3 of this EIS.

Cleanup and Restoration

Following backfilling, all work areas would be final-graded and restored to preconstruction contours as closely as possible. Prior to final grading, all construction debris would be picked up along the right-of-way. Permanent erosion control structures, such as slope breakers, would be installed during final grading, in accordance with the FERC Plan. Our Plan requires that restoration be completed within 20 days after backfilling, unless prevented by inclement weather conditions. Private property such as fences, field roads, and driveways would be restored or repaired as necessary.

Revegetation would be accomplished by seeding disturbed areas in accordance with the recommendations of the local office of the Natural Resources Conservation Service (NRCS) or as requested by the landowner. Seeding would not be required in active cultivated croplands, unless specifically requested by the landowner. Revegetation is further discussed in section 4.4.2 of this EIS.

2.4.2.2 Special Pipeline Construction Techniques

Utility, Railroad, and Road Crossings

Prior to construction, Ingleside San Patricio would contact the local "One Call" or "Call Before You Dig" system to determine the location of utilities to be crossed. These utility crossings would then be marked in the field during pre-construction surveys.

Railroads and paved roads would be crossed using a bore or HDD. For the bore method, pits would be excavated on both sides of the road or railroad at the depth of the ditch. A boring machine uses an auger to drill a tunnel under the road or railroad, wide enough for the pipeline and casing to be pulled through. Unpaved county roads would be open-cut. During the cut, usually one lane of traffic would be left open. Steel plates may be used to cover the open trench.

Utility, road, and railroad crossings would be done according to applicable permits. Local authorities would be kept apprised of the timing of such crossings.

Agricultural Areas

Ingleside San Patricio estimates that about 70 percent of the pipeline route is agricultural land. By adhering to the measures in our Plan, which is designed to minimize impact on soils, Ingleside San Patricio would minimize impacts on agricultural and prime farmland soil. These measures include coordination with the landowner or land management agency, topsoil segregation, use of the ditch plus spoil method; maintenance of water flow in crop irrigation systems, removal of large rocks, and repair of rutting or compaction. Ingleside San Patricio indicated it would schedule construction for the winter season to reduce impacts associated with

crossing agricultural lands. A more detailed discussion of agricultural areas can be found in section 4.2.1 of this EIS.

Wetlands and Waterbodies

Ingleside San Patricio would use a 75-foot-wide construction right-of-way for its pipeline crossing of wetlands. For conventional wetland crossings, Ingleside San Patricio would segregate the top 12 inches of topsoil. When crossing saturated wetlands, Ingleside San Patricio may stabilize the travel lane using timber riprap, prefabricated equipment mats, or terra mats. Two perennial streams and seven ditches or canals would be crossed using the HDD method. A more detailed discussion of waterbody and wetland construction can be found in sections 4.3.2 and 4.4.1 of this EIS, respectively.

2.4.2.3 Aboveground Facility Construction Procedures

Aboveground facilities that would be constructed as part of the Project include meter stations, MLV, pig launcher and receiver. Construction of the meter stations would involve clearing and grading, where necessary. Foundations would be poured; piping, valves, fittings, and flanges assembled on-site; equipment mounted on the foundations; and auxiliary buildings erected. Lastly, access roads and parking lots would be paved, a permanent perimeter fence would be installed surrounding the facilities, and landscaping would be completed.

Pigging facilities would be located within the San Patricio meter station at the beginning of the pipeline (MP 0.0) and the Tennessee meter station at the northern end of the pipeline (MP 26.3). A MLV would be collocated with the Tetco meter station at MP 12.5, and would be fenced.

2.5 CONSTRUCTION SCHEDULE

Ingleside San Patricio wants to have the Project in operation by about October 2008. It should take a total of about 37 months to construct the entire Project. The first part of this process would be the relocation of the Occidental Chemical's existing loading dock, which would take about 14 months, including dredging, removal of the existing dock, and construction of the new dock. At the same time the onshore Occidental Chemical piping and tank would be relocated. Then the marine basin and maneuvering area would be dredged and the new LNG dock constructed, taking about 14 months total to complete. Concurrent with the dredging for the relocation of the Occidental Chemical dock, Ingleside San Patricio would begin erection of the LNG storage tanks, requiring about three months for grading, nine months to lay foundations, and about 23 months to complete construction of the tanks.

It would take a total of about nine months to construct the entire 26.4-mile-long, 26-inch-diameter pipeline, and associated aboveground facilities, from initial clearing through final restoration. Therefore, pipeline and meter station construction would not begin until about the same time as the connecting pipelines at the LNG terminal. The pipeline would be built as one spread. A separate construction crew would build the meter stations.

2.6 ENVIRONMENTAL COMPLIANCE AND MONITORING

Ingleside San Patricio would implement environmental compliance and monitoring requirements from the FERC's Plan and Procedures during construction of the LNG terminal and pipeline. Ingleside San Patricio would also incorporate compliance and monitoring requirements from federal, state, and local permits obtained for the Project.

In accordance with the FERC's Plan and Procedures, Ingleside San Patricio would conduct environmental training for construction and contractor personnel before construction and periodically during construction. Ingleside San Patricio would employ at least one environmental inspector (EI) for construction of the LNG terminal, and at least one EI for construction of the pipeline and meter stations. The EIs would be responsible for monitoring construction activities for compliance with the conditions of the FERC Certificate, and all other applicable federal, state, and local permits. The EIs would have independent status, but would report to Ingleside San Patricio's Chief Inspector, and would have stop-work authority in the event of a noncompliance issue that requires corrective action.

In addition, the FERC would have its own independent EIs monitor the Project for compliance with the Commission's environmental conditions.

2.7 OPERATION AND MAINTENANCE

Ingleside San Patricio would incorporate post-construction environmental requirements into an *Operation and Maintenance Plan* and an *Emergency Plan and Procedures* for the Project.

2.7.1 LNG Terminal Facilities

Imported LNG would be obtained from liquefaction plants throughout the world (*e.g.*, Trinidad, Nigeria, Algeria, Qatar, and Venezuela) and delivered via LNG ships to the proposed terminal. LNG ships would enter Corpus Christi Bay under the command of a local pilot who would decide whether the current and wind conditions allow safe entry to the Corpus Christi Channel. The pilot would direct the maneuvering of the LNG ship in the harbor using the Project-dedicated tugboats. The pilot would direct the securing of the lines and would turn the command back to the captain when the ship is secured.

Upon arrival at the terminal, the ship would dock securely at the berth of the unloading facility, attach to the unloading arms, and transfer LNG from the ship to the storage tank using the ship's LNG pumps. Three unloading arms would be dedicated to the unloading of LNG while a fourth arm would be a vapor return arm to maintain a vapor balance within the ship's LNG tanks. After the LNG is offloaded, the ship would be detached from the unloading arms and mooring and breasting dolphins, moved from the slip with tug assistance, and turned to face southeast along the La Quinta Channel.

The BOG generated from vaporization of LNG while in the storage tanks, and pipeline and flash gas from pump circulation would be compressed by a BOG compressor and then passed to a condensor system where it would be condensed into the outgoing LNG.

Three in-tank pumps and six sendout pumps would be used to pressurize the stored LNG to pipeline pressure and pump the pressurized LNG to the STV. The vaporization process would involve warming the LNG and converting it back to a gaseous state and using heated wastewater from Occidental Chemical's and/or ICLP's cooling water system as a source of vaporization heat for the LNG. The LNG from the sendout pumps would enter the vaporizer tubes and an intermediate fluid would be circulated over the tubes containing the LNG and warming it to a gaseous state. Heated wastewater would be cooled by the LNG and returned to the Occidental Chemical and/or ICLP facility for reuse. The natural gas would be odorized and then discharged into the sendout pipeline for delivery to markets.

Ingleside San Patricio estimates that maintenance dredging of the LNG terminal maneuvering area and ship slip would be required every 10 to 12 years. Materials excavated during maintenance dredging are expected to be deposited at Alcoa's tailing ponds. The COE would be responsible for maintenance dredging along the La Quinta Channel.

Ingleside San Patricio would operate and maintain its facilities in compliance with 49 CFR 193, and 33 CFR 127, NFPA 59A, and other applicable federal and state regulations. In accordance with 49 CFR 193.2503 and 193.2605 and Sections 11.3.1 and 11.5.2 of NFPA 59A, Ingleside San Patricio is required to prepare and submit manuals that address specific procedures for the safe operation and maintenance of the LNG storage and processing facilities. These manuals would address startup, shutdown, cooldown, purging, and other routine operation, maintenance, and monitoring procedures. In accordance with 33 CFR 127.305, Ingleside San Patricio would also prepare an operation manual that addresses specific procedures for the safe operation of the ship unloading facilities. These manuals would include training requirements and programs for operation and maintenance personnel.

2.7.2 Pipeline and Associated Aboveground Facilities

Ingleside San Patricio would operate and maintain the proposed facilities in accordance with the applicable safety standards established by the DOT Minimum Federal Safety Standards as specified in 49 CFR 192 and in accordance with the NGA. The pipeline would be patrolled from the air on a periodic basis. This patrol would provide information on possible leaks, encroachment into the right-of-way, third party construction activity near the pipeline, erosion, waterbody crossings, exposed pipe, or population density changes in the vicinity of the pipeline. Operation would also include monitoring of cathodic protection units (installed for corrosion control) along the pipeline to ensure proper functioning.

Maintenance activities would include regularly scheduled gas leak surveys, and measures necessary to repair any leaks. All fence posts, signs, marker posts, aerial markers, and decals would be painted or replaced as necessary to ensure the pipeline location remains visible from the air and ground. All valves would be periodically inspected and greased. Maintenance would also include periodic seasonal mowing of the permanent right-of-way, vegetation control around aboveground facilities, and the repair of terraces as necessary. Ingleside San Patricio would not use herbicides or pesticides within 100 feet of a wetland or waterbody unless approved in appropriate permits.

2.8 SAFETY CONTROLS

2.8.1 LNG Terminal Facilities

The LNG terminal facilities would be sited, designed, constructed, operated, and maintained in compliance with federal safety standards. Federal siting and design requirements for LNG terminal facilities are summarized in table 2.8.1-1.

TABLE 2.8.1-1

Federal Siting and Design Requirements for LNG Facilities

Requirement	Description
Thermal Radiation Protection (49 CFR 193.2057 and Section 2.2.3.2 of NFPA 59A)	This requirement is designed to ensure that certain public land uses and structures outside the LNG facility boundaries are protected in the event of an LNG fire.
Flammable Vapor-Gas Dispersion Protection (49 CFR 193.2059 and Sections 2.2.3.3 and 2.2.3.4 of NFPA 59A)	This requirement is designed to prevent a flammable vapor cloud associated with an LNG spill from reaching a property line of a property suitable for building.
Wind Forces (49 CFR 193.2067)	This requirement specifies that all facilities be designed to withstand wind forces of not less than 150 miles per hour without the loss of structural integrity.
Impounded Liquid (Section 2.2.3.8 of NFPA 59A)	This requirement specifies that liquids in spill impoundment basins cannot be closer than 50 feet from a property line of a property suitable for building or a navigable waterway.
Container Spacing (Section 2.2.4.1 of NFPA 59A)	This requirement specifies that LNG containers with capacities greater than 70,000 gallons must be located a minimum distance of 0.7 times the container diameter from the property line or buildings.
Vaporizer Spacing (Section 2.2.5.2 of NFPA 59A)	This requirement specifies that integral heated vaporizers must be located at least 100 feet from a property line of a property suitable for building and at least 50 feet from other select structures and equipment.
Process Equipment Spacing (Section 2.2.6.1 of NFPA 59A)	This requirement specifies that process equipment containing LNG or flammable gases must be located at least 50 feet from sources of ignition, a property line of a property suitable for building, control rooms, offices, shops, and other occupied structures.
Marine Transfer Spacing (33 CFR 127.105)	This requirement specifies that each LNG unloading flange must be located at least 985 feet from any bridge crossing a navigable waterway.

2.8.1.1 Spill Containment

In addition to the double-containment storage tanks described in section 2.2.1.4 of this EIS, two impoundment basins would be located at the LNG terminal site. These impoundment basins would be sloped for drainage and equipped with pumps that would discharge rainfall runoff at a rate equal to or greater than 25 percent of the 10-year frequency, 1-hour duration storm.

A primary impoundment basin would be located between the LNG storage tanks and the dock/jetty platform. It would be 50 feet by 50 feet with a usable depth of 30 feet, which creates a holding capacity of 561,039 gallons. Collection troughs would drain any accidentally spilled

LNG from under the facility transfer lines to the primary impoundment basin. Pumps would discharge rainfall runoff into an existing drainage system.

A second impoundment basin would be located in the process area to collect spills from the vaporizer area where glycol may be present. It would be 20 feet by 20 feet with a usable depth of 30 feet, which creates a holding capacity of 89,766 gallons. Pumps would discharge rainfall runoff into a 1.2 million gallon stormwater tank.

Both of the impoundment basins would be equipped with automatic level control activators and low-temperature sensors and switches to prevent operations of the pumps in the event of an accidental release of LNG into the basin.

2.8.1.2 Hazard Detection System

The LNG terminal would have a monitoring system able to detect fire, combustible gas, and low-temperature LNG spills. Audible and visual alarms would be located throughout the terminal site. All monitors would be hardwired from a field device into a control room that would be equipped with fire and gas detectors. An independent safety instrumented system (SIS) would be installed to allow for safe, sequential shutdown and isolation of both rotating and fired equipment and the LNG storage facilities.

A closed-circuit television system would be installed to provide the operators and security staff with panoramic and variable zoom views of the plant and dock/jetty areas. The control room, channel, and berth areas would each have camera controllers and overhead television monitors. In addition, 18 color television cameras with zoom, panoramic, and tilt functions would be installed throughout the LNG terminal site.

2.8.1.3 Fire Protection System

The main components of the fire protection system at the LNG terminal include:

- a 1,200,000 gallon firewater pond;
- six firewater pumps (one driven by an electric motor and the other driven by a diesel engine), each designed to provide 2,500 gpm at 150 psi;
- one electric motor driven jockey pump, designed to provide 215 gpm at 150 psi;
- 50 fire monitors, of which two are elevated;
- hose reels and firewater piping distribution system;
- 50 hand-held portable fire extinguishers; and
- audible alarms.

Water for the firewater pond would be obtained from the San Patricio Water District. To test the firewater system, Ingleside San Patricio would withdraw about 420,000 gallons of seawater on a weekly basis. The water would be discharged back into the pump suction area adjacent to suction screens at a rate of 14,000 gpm. Potential impacts on marine waters and organisms are discussed in sections 4.3.2.1 and 4.5.1.5 of this EIS.

Nitrogen for LNG Tank Relief Valves

Nitrogen snuffing would be provided at the tailpipe of each LNG storage tank pressure relief valve. This would enable a fire in the relief valve discharge piping to be extinguished. The nitrogen piping for the relief valve tailpipe purging would be located along the side of the tank and terminated in a safe location at grade with a valve connected to the nitrogen system.

High Expansion Foam System

Ingleside San Patricio would install a high expansion foam system for the LNG terminal facility. It would be self powered, so no electrical power would be required. The system would have a carbon steel foam solution storage tank, two high expansion foam generators, and all other necessary accessories for proper operation. The system would have the ability to flood the impoundment basins with foam to a depth of 6 feet within one minute. Connections would be provided to the firewater system for use with this foam system.

Vent Systems

Each LNG storage tank would have pilot-operated pressure relief valves. The valves would relieve pressure from the inner tank vapor space. Inlet piping would penetrate the suspended deck so that, in the event of an overfill, LNG could not block the pressure relief inlet pipes. Pressure relief valve outlet pipes would discharge vertically at a height that would not require water protection on the roof should a pressure relief fire occur. The outlet pipes would be equipped with a rain flapper and drain. Each pressure relief valve would have a nitrogen purge and connection for extinguishing small fires and purging against ice formation should it occur. The operation valve would be located remote from the storage tanks at a grade level that would allow the operator to supply nitrogen in case of a small relief valve fire.

Emergency Shutdown System

An independent SIS would be installed to allow the safe, sequential shutdown and isolation of rotating equipment and LNG storage facilities. Three levels of shutdown would be configured for the LNG terminal.

Level 1 (LNG Ship Unloading Shutdown) – Could be initiated manually or automatically by local instrumentation, storage tank high-high liquid level, storage tank high pressure, or by the LNG ship. Level 1 shutdown would include LNG ship transfer pump stoppage in a safe and controlled manner without disconnecting the LNG transfer arms. LNG ship transfer pump stoppage can be activated by either the ship's own shutdown system or by the facility's overall SIS shutdown system.

Level 2 (LNG Ship Unloading Shutdown) – Could be initiated manually, by the LNG ship, or by unloading arm operating parameters that exceed safe operating limits. All shutdowns described for Level 1 above would occur, plus the PERCs on the unloading arms would release.

Level 3 (Vaporizer Train Shutdown) – This shutdown may be initiated manually and initiates a shutdown and isolation of all sendout pumps and vaporizers. LNG ship unloading would be unaffected by a Level 3 shutdown.

A partial facility shutdown may be initiated by activating either Level 1, 2, or 3 pushbuttons in response to a major incident such as fire, vapor, or liquid release. A total facility emergency shutdown can only be initiated in the control room by activating all three level pushbuttons. Upon activation of the total facility shutdown, the SIS would shut down sequentially and isolate the terminal equipment, including stopping LNG ship unloading and disconnecting the unloading arms from the LNG ship.

2.8.2 Pipeline and Associated Aboveground Facilities

2.8.2.1 Corrosion Protection and Detection Systems

During construction of the proposed facilities, Ingleside San Patricio would install a cathodic protection system to prevent or minimize corrosion of the buried pipeline and aboveground facilities. The cathodic protection system impresses a low-voltage current on the pipeline to offset natural soil and groundwater corrosion potential. Cathodic protection beds would be installed at 1-mile intervals along the pipeline route, near road crossings. The condition of the pipe coating and the effectiveness of the cathodic protection system would be monitored during regularly scheduled cathodic protection surveys in accordance with federal standards and regulations. Cathodic protection surveys usually require walking the pipeline right-of-way with monitoring instruments. Repairs to the pipe, the pipe coating, or the cathodic protection system would be made as appropriate.

2.8.2.2 Emergency Response Procedures

The proposed pipeline and aboveground facilities must be designed, constructed, operated, and maintained in accordance with the DOT Minimum Federal Safety Standards in 49 CFR 192. The regulations are intended to ensure adequate protection for the public and to prevent natural gas facility accidents and failures. Part 192 specifies material selection and qualification; minimum design requirements; and protection from internal, external, and atmospheric corrosion. Part 192 also prescribes the minimum standards for operating and maintaining pipeline facilities, including the requirement to establish a written plan governing these activities. Under Section 192.615, each pipeline operator must also establish an emergency plan that includes procedures to minimize the hazards in a natural gas pipeline emergency. Key elements of the plan include procedures for:

- receiving, identifying, and classifying emergency events, gas leakage, fires, explosions, and natural disasters;
- establishing and maintaining communications with local fire, police, and public officials, and coordinating emergency response;
- making personnel, equipment, tools, and materials available at the scene of an emergency;
- protecting people first and then property, and making them safe from actual or potential hazards; and
- emergency shutdown of system and safe restoration of service.

Part 192 also requires that each operator must establish and maintain a liaison with appropriate fire, police, and public officials to learn the resources and responsibilities of each organization that may respond to a natural gas pipeline emergency, and to coordinate mutual assistance. The operator must also establish a continuing education program to enable customers, the public, government officials, and those engaged in excavation activities to recognize a gas pipeline emergency and report it to appropriate public officials.

2.9 FUTURE PLANS AND ABANDONMENT

The Project as proposed includes no plans for future abandonment. However, Ingleside San Patricio anticipates that over the life of the Project (40 years) the LNG terminal facility could be upgraded and/or expanded. No future expansion is currently planned or proposed. Such actions would require a separate application to the FERC.

2.10 NONJURISDICTIONAL FACILITIES

Under Sections 3 and 7 of the NGA, the FERC considers all relevant factors bearing on the public convenience and necessity as part of a decision to approve jurisdictional facilities. The jurisdictional facilities for the Ingleside Energy Center LNG Project include the proposed LNG terminal facilities and proposed new natural gas pipeline and its associated aboveground facilities. Occasionally, proposed projects have associated facilities that do not come under the jurisdiction of the Commission.

There are four nonjurisdictional facilities related to this project: (1) relocation of Occidental Chemical's existing loading dock (also referred to as the vinyl chloride monomer [VCM] dock) and chemical storage tank and construction of a (2) NGL recovery facility, (3) medium pressure natural gas pipeline, and (4) heated wastewater delivery and cool water return system. These facilities would be located within Ingleside San Patricio's proposed LNG terminal site. Ingleside San Patricio stated that separate permits are not required for the proposed nonjurisdictional facilities. Permits for the NGL recovery facility, 12-inch-diameter medium pressure natural gas pipeline, and waste heat delivery and cool water return systems are all included in the overall permitting of the proposed terminal. The permitting for the relocation of Occidental Chemical's existing loading dock is also included in the terminal permitting and is separately stated in the COE and Texas Commission on Environmental Quality (TCEQ) permits.

2.10.1 Relocation of Occidental Chemical's Existing Loading Dock and Chemical Storage Tank

Prior to dredging and constructing the LNG ship berth area, Ingleside San Patricio and Occidental Chemical would relocate Occidental Chemical's existing loading dock from its current location, west of the proposed LNG ship berth area, to an area about 2,000 feet to the northwest. This dock is used by Occidental Chemical to load products on to ships for customer delivery. The existing loading dock, and associated facilities, would be removed and rebuilt in the same configuration and orientation to the La Quinta Channel as the existing dock. Although a dredged channel exists at the new dock location, about 550,300 cubic yards of material would be dredged to accommodate the ships that come to Occidental Chemical's manufacturing

complex. This would result in the removal of about 15 acres of benthic substrate and 0.53 acre of seagrass bed.

The relocated dock would be constructed using methods similar to those described for the LNG dock/jetty platform and would take about eight months to complete. Impacts and mitigation on the benthic substrate and seagrass bed would be similar to those discussed for the LNG ship berth and maneuvering basin in section 4.0 of this EIS.

In addition to relocating Occidental Chemical's existing loading dock, a chemical storage tank that is located at Ingleside San Patricio's proposed LNG storage tank area would be relocated about 250 feet northwest of its current location on Occidental Chemical's property. The area required for the tank is about 2.76 acres.

2.10.2 Natural Gas Liquids Recovery Facility

If market conditions warrant, Ingleside San Patricio would construct a NGL recovery facility to remove NGL (ethane, propane, and butane) from the LNG stream. The NGL would be added into the local products pipeline grid as feedstock for the local petrochemical industry. Removal of NGL would upgrade the LNG to a higher value product before it enters the natural gas pipeline system.

The NGL recovery facility would be about 0.82 acre in size and be located 450 feet south of the LNG storage tanks. The NGL would be removed from the LNG stream by integrating a NGL removal facility with the LNG terminal. The NGL removal facility would receive LNG from the storage tank pumps and vaporize the LNG so that the remaining liquid stream contains NGL components. This liquid stream would be fractionated in a demethanizer to produce an ethane and raw NGL mix that would be further fractionated in a deethanizer to produce ethane, propane, and butane. Ingleside San Patricio estimates that about 55,000 barrels of NGL would be produced daily. The NGL recovery system would include a compressor and heat exchanger that would condense natural gas vapor back to a liquid (recondensed LNG) and send this liquid to high-pressure sendout pumps. Two lines would deliver the ethane and raw NGL mix to the Occidental Chemical manufacturing complex where existing pipelines would transport the mix to existing liquid lines. The NGL recovery facility can be shut down if NGL recovery is not economically feasible. Land impacts and mitigation proposed for this facility would be similar to those discussed for the LNG terminal in section 4.0 of this EIS.

2.10.3 Medium-pressure Gas Pipeline

Ingleside San Patricio would construct a 1.5-mile-long, 12-inch-diameter pipeline to deliver BOG and natural gas to the Occidental Chemical and ICLP facilities located north of the LNG terminal site. This pipeline and the proposed waste heat delivery and cool water return system would occupy about 4.8 acres. A compressor would pressurize the gas to about 500 psig. Two meter stations would be located at the end of the pipeline to meter the gas for each facility. Land impacts and mitigation proposed for this facility would be similar to those discussed for the LNG terminal in section 4.0 of this EIS.

2.10.4 Heated Wastewater Delivery and Cool Water Return System

The vaporization heat needed for the Project would be provided by heated wastewater that is currently rejected from cooling towers at the Occidental Chemical and ICLP facilities and would be pumped to and from the proposed LNG terminal via a piping system, which along with the proposed 12-inch-diameter pipeline would occupy about 4.8 acres. To accommodate for reduced water consumption at Occidental Chemical's facility, an existing wooden cooling tower would be rebuilt as a fiberglass tower to allow for anticipated reduced water usage by Occidental Chemical without having the tower develop dry rot or present a fire risk when empty. Land impacts and mitigation proposed for this facility would be similar to those discussed for the LNG terminal in section 4.0 of this EIS.

2.10.5 Summary of Nonjurisdictional Facilities

Under the NEPA, the Commission has the responsibility to attempt to review infrastructure facilities that are associated with, and a necessary part of, a jurisdictional project. Our review of the nonjurisdictional facilities including the relocation of Occidental Chemical's existing loading dock and chemical storage tank, construction of a NGL recovery facility, medium pressure natural gas pipeline, and heated wastewater delivery and cool water return system indicate that construction would not have an adverse impact on the environment. Relocation of Occidental Chemical's existing loading dock would temporarily increase the potential sedimentation in the La Quinta Channel; however, Ingleside San Patricio's use of our Procedures and implementation of other federal or state permit requirements would protect aquatic resources. As previously stated, the applicable federal and state permitting for the nonjurisdictional facilities is included in the terminal permitting and is separately stated in the COE and TCEQ permits.