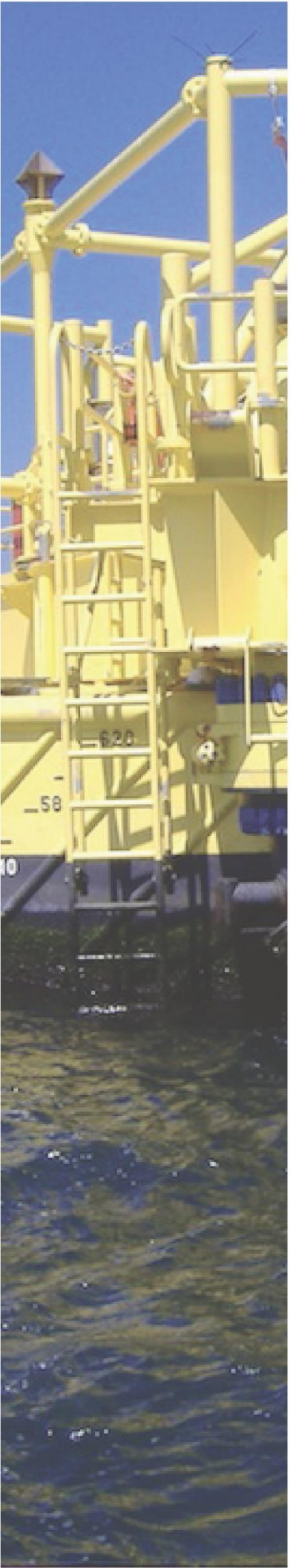

TEXAS GulfLink

Volume I. Deepwater Port License Application

(Public)

Prepared by:

Abadie-Williams

ENGINEERING CONSULTANCY REDEFINED

Submitted to:

Maritime Administration Office of
Deepwater Ports and Offshore Activities
1200 New Jersey Avenue SE, W21-309
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United States Coast Guard
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Submitted by:

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Info:

Single point mooring on Whiddy Island, Ireland

File:Whiddy Spim.jpeg
Created: 19 July 2015
Location: 51° 41′ 51″ N, 9° 32′ 10″ W

Note from Applicant: Texas GulfLink attempted to make a proactive effort to interface with as many local, state, and federal stakeholders prior to application submission.

We know and understand that it was not possible to directly engage and meet with all residents, agencies, and public officials, but sincerely appreciate the opportunity to discuss Texas GulfLink with each of them in the near future.

Thank you in advance for the patience, and we welcome the chance for a formal introduction.

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Abbreviations & Acronyms

A&R	Abandonment and Recovery
ABS	American Bureau of Shipping
ACHP	Advisory Council on Preservation
AIS	Automatic Information System
ANSI	American National Standards Institute
AFBMA	Anti Friction Bearing Manufactures Association
AISC	American Institute of Steel Construction
AMM	Assistant Mooring Master
APE	Areas of Potential Effect
API	American Petroleum Institute
APT	American Petroleum Tankers
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATBA	Area to be Avoided
ATON	Aids to Navigation
ATWS	Additional Temporary Workspace
AW	Abadie-Williams
AWOIS	Automated Wreck and Obstruction Information System
AWS	American Welding Society
B.S.	British Standards
BA	Brazos Area
BBL	Barrel (42 US Gallons)
BEACH	Beaches Environmental Assessment and Coastal Health Act
BGEPA	Bald and Golden Eagle Protection Act
BPH	barrels per hour
BML	Below the Mudline
B/Y	Black and Yellow
BMP	Best Management Practices

BOEM	Bureau of Ocean Energy Management
BSEE	Bureau of Safety and Environmental Enforcement
BTU	British Thermal Unit
BW	Black Water
CAA	Clean Air Act
CALM	Catenary Anchor Leg Mooring
CCR	Cargo Control Room
CCTV	Closed Circuit Television
CFR	Code of Federal Regulations
CMP	Coastal Management Plan
CO2	Carbon Dioxide
COC	Certificate of Compliance
COTP	Captain of the Port
cP	Centi-Poise
CRM	Control Room Management
CTA	Cargo Transfer Assistant
CWA	Clean Water Act
CZMA	Coastal Zone Management Area
C/M	Chief Mate
DNV	Det Norske Veritas
DOI	Department of Interior
DOT	Department of Transportation
DPLA	Deepwater Port License Application
DSV	Dive Support Vessel
DWP	Deepwater Port
DWPA	Deepwater Port Act
DWT	Deadweight Tonnage
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EPA	Environmental Protection agency

ERV	Emergency Response Vessel
ESA	Endangered Species Act
ESD	Emergency Shut Down
ETA	Estimated time of Arrival
°F	Fahrenheit
F&G	Fire and Gas
FBE	Fusion Bonded Epoxy
FCC	Federal Communications Commission
FEED	Front End Engineering Design
FERC	Federal Energy Regulatory Commission
FSO	Facility Security Officer
FSP	Facility Security Plan
FRP	Facility Response Plan
FWPCA	Federal Water Pollution Control Act
FWS	Fish and Wildlife Service
GA	Galveston Area
GIS	Geographic Information System
GIWW	Gulf Intracoastal Waterway
GLO	Texas General Land Office
GMPHOM	Guide to Manufacturing and Purchasing Hoses
GPS	Global Positioning System
GW	Grey Water
HAZID	Hazard Identification
HAZOP	Hazard and Operability
HDD	Horizontal Directional Drill
HDPE	High Density Polyethylene
HIV	High Interest Vessel
HMTA	Hazardous Material Transportation Act
hp	horsepower
HSSE	Health, Safety, Security, Environment

HWM	High Water Mark
Hz	Herts
IACS	International Association of Classification Societies
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
IAP	Incident Action Plan
IC	Incident Commander
ICS	Incident Command System
ICWW	Intracoastal Waterway
ID	Inside Diameter
IEC	International Electrical Commission
ILI	In Line Inspection
IMCA	International Marine Contractors Association
IMO	International Maritime Organization
IMP	Integrity Management Plan
ISGOTT	International Safety Guide for Oil Tankers and Terminals
ISO	International Standards Organization
ISSC	International Ship Security Certificate
JSA	Job Safety Analysis
KPI	Key Performance Indicator
Kbbl	Thousand Barrels
LACT	Lease Automatic Custody Transfer
LOI	Letter of Intent
LRAD	Long-Range Acoustic Device
MAOP	Maximum Allowable Operating Pressure
MARAD	Maritime Administration
MARPOL	International Convention for the Prevention of Pollution from Ships
MARSEC	Maritime Security
MAWP	Maximum Allowable Working Pressure
MBTA	Migratory Bird Treaty Act
MCC	Motor Control Center

MHZ	Megahertz
mils	Thousands of an Inch
MM	Mooring Master
MMbbl	Million Barrels
MMPA	Marine Mammal Protection Act
MMS	Minerals Management Service
MOP	Maximum Operating Pressure
MP	Milepost
MPH	Morris P Hebert
MPRSA	Marine Protection, Research and Sanctuaries Act
MSh	Mud and Shells
MSS	Manufacturers Standardization Society
Mt	Metric Ton
MTR	Material Test Report
MTRF	Marine Transportation-Related Facility
NAA	No Anchoring Area
NAAQS	National Ambient Air Quality Standards
NACE	National Association of Corrosion Engineers
NDE	Non-destructive Examination
NEC	National Electric Code
NESC	National Electric Safety Code
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
NHPA	National Historic Preservation Act
NIMS	National Incident Management System
NOA	Notice of Arrival
Nm	Nautical Miles
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent

NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRC	National Response Center
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NVMC	National Vessel Movement Center
OCIMF	Oil Companies International Marine Forum
OCS	Outer Continental Shelf
OCSLA	Outer Continental Shelf Land Act
OD	Outside Diameter
OMC	Oil Movement Controller
OSHA	Occupational Safety and Health Administration
OSRO	Oil Spill Removal Organization
OSRP	Oil Spill Response Plan
OPA	Oil Pollution Act
OQ	Operator Qualification
PHMSA	Pipeline and Hazardous Material Safety Administration
PIC	Person in Charge
PLC	Process Logic Controller
PLEM	Pipe Line End Manifold
PPE	Personal Protection Equipment
PRV	Pressure Relief Valve
PSD	Prevention of significant Deterioration
PSI	Pounds Per Square Inch
PSIG	Pounds Per Square Inch Gauge
PSV	Pressure Safety Valve
RACON	Radar Beacon
RRC	Railroad Commission of Texas
RHA	Rivers and Harbor Acts
ROW	Right-of-Way

RPM	Revolutions Per Minute
SACS®	Design and Analysis Software for Offshore Structures
SALM	Single Anchor Leg Mooring
SCADA	Supervisory Control and Data Acquisition
SCFM	Standard Cubic Ft. per Minute
SCR	Steel Catenary Risers
SDV	Shut Down Valve
SIL	Safety Integrity Level
SOLAS	Safety of Life at Sea
SOP	Standard Operating Procedures
SPCC	Spill Prevention, Control and Countermeasure Plan
SPFD	Simplified Flow Diagram
SPM	Single Point Mooring
SSC	Standard Practice, Stress Corrosion Cracking
SSDM	Seafloor Survey Data Model
TCMP	Texas Coastal Management Program
TCEQ	Texas Commission on Environmental Quality
TGL	Texas GulfLink
THC	Texas Historical Commission
THPO	Tribal Historic Preservation Officers
TOP	Top of Pipe
TPWD	Texas Parks and Wildlife Department
TSA	Terminal Service Agreement
TWIC	Transportation Worker Identification Credential
UPS	Uninterruptible Power Supply
U.S.A.	United States of America
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
USDOI	United States Department of the Interior
USEPA	United States Environmental Protection Agency

USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VDU	Vapor Destruction Unit
VEC	Vapor Emission Control
VECS	Vapor Emission Control System
VFD	Variable Frequency Drive
VHF	Very High Frequency
VLCC	Very Large Crude Carriers
VOC	Volatile Organic Compounds

Overview of Project

In 2015, Congress lifted the 40-year ban on oil exports, allowing tankers filled with U.S. crude oil to export to international markets. The repeal of the export ban unleashed a flood of U.S. produced shale oil onto the world market, historically controlled by the Organization of Petroleum Exporting Countries (OPEC). In 2005, before the shale revolution, the United States had net imports of 10.7 million barrels per day (bpd) of crude and fuels. Evidenced by the net import of only 6.6 million bpd today, the lifting of the U.S. export ban has eroded the market share of OPEC countries and the Middle East's control of the world crude market, ushering in the age of United States energy independence.

U.S. producers are now exporting to some of the world's biggest oil-importing nations in Asia and Europe. The export boom has filled pipelines and sparked a surge of investment in new shipping infrastructure along the Gulf Coast; particularly the need for large-scale projects capable of loading large quantities on Very Large Crude Carriers (VLCCs).

U.S. producers now export between 1.5 million and 2 million barrels of crude per day, which could rise to between 4 million and 7 million by conservative estimates by 2022, according to the U.S. Energy Information Agency (EIA). Future forecasts predict that 80% of global crude oil supply growth in the next decade will be produced in the United States. Much of the increased flow is expected to be delivered to Asia, the top importer of crude worldwide and second largest buyer of U.S. produced crude.

Between 2010 and 2017, U.S. oil production rose from 5.5 million bpd to 10 million bpd as shale fields in West Texas and North Dakota saw massive incremental drilling investments. The increased production brought the U.S. on par with Saudi Arabia and close to Russia's 10.9 million bpd, the world's top producer. As a result, OPEC, led by Saudi Arabia, cut output in 2017, in an effort to reduce supply and raise prices, after losing the battle with U.S. producers for production supremacy.

Foreign oil imports domestically have also taken a back seat to U.S. produced crude oil. Total U.S. crude imports have dropped to 6.6 million bpd from a peak of 10.7 million bpd in 2006. OPEC's representative value of that decline was nearly half, now representing an approximate 37 percent of crude oil imports to the United States. American refineries now are relying on more on domestic production and Canadian import production.

Surging U.S. exports has driven the need for domestic energy investment, forcing terminals and ports in Texas and around the Gulf Coast to enhance infrastructure to handle larger tankers. Gulf Coast terminals are responsible for nearly 75 percent of all U.S. crude exports, but only the Louisiana Offshore Oil Port (LOOP) can handle supertankers that can carry up to 2 million barrels of oil. The remaining export production relies on lightering, a method where smaller ships load a larger ship in multiple trips. Lightering has inherent safety concerns. Not only is it an inefficient method to load large quantities of crude oil for export, but it is also subject to the necessary realities of port congestion and imminent weather delays.

The Texas GulfLink Project will provide a large-scale infrastructure facility to accommodate deep draft tankers that can export crude oil to international markets. Texas GulfLink will provide the United States with an economical solution to clear the over-supply barrels destined for the Gulf Coast. Texas GulfLink has put together a team of industry-leading professionals who possess extensive experience in construction and operation of deepwater ports, and are well-positioned to leverage that experience as prudent operators, exceeding industry standards for safety and environmental protection. From commercial development to operations, the team has extensive experience designing, managing and leading an organization that can store large volumes of crude oil in above-ground storage facilities with pipeline connectivity to load VLCCs at an offshore Deepwater Port complex. Coupled with the financial

backing of an experienced private equity fund dedicated to investing in the energy midstream space, the team is uniquely positioned to take this project from conceptual design, through permitting and construction, to commissioning. Texas GulfLink will provide a neutral infrastructure solution without the inherent conflicts of affiliated marketing, as the best approach to support the interests of U.S. producers, and lead to the greatest outcome for all stakeholders.

Texas GulfLink is seeking a Deepwater Port License to construct, own, and operate a Deepwater Oil Port near Freeport, Texas capable of loading deep draft crude carrying vessels. The Deepwater Port will deliver crude oil via an onshore crude pipeline from above ground crude oil storage tanks. Upon nomination from the crude oil shipper, the oil will be transported to one of two floating Single Point Mooring (SPM) buoys in the Gulf of Mexico, approximately 28.3 nautical miles offshore, via a 42-inch pipeline. The SPM buoys will allow for Very Large Crude Carrying Vessels (VLCCs) to moor and receive up to 2 million barrels of crude at a rate of 1.0 million bpd on the average to be transported internationally. A manned, offshore platform complex, equipped with around-the-clock port monitoring, custody transfer metering, and surge relief will provide assurance that the shipper's commercial risks are mitigated and the port is protected from security threats and environmental risks.

The Deepwater Port offshore facility will consist of the following assets:

- One 42-inch outside diameter, 28.3 nautical mile long crude oil pipeline would be constructed from the shoreline crossing in Brazoria County, Texas, to the Texas GulfLink Deepwater Port for crude oil delivery. The pipeline, in conjunction with 12.4 statute miles of new-build onshore pipelines, will connect the onshore crude oil storage facility and pumping station (Jones Creek Terminal) to the offshore Texas GulfLink Deepwater Port. The crude oil will be metered departing the onshore terminal as it leaves the tank and again at the offshore platform, providing custody transfer and line surveillance.
- Two fixed offshore platform structures, with 4 piles each, located in the Galveston Outer Continental Shelf lease block 423, approximately 28.3 nautical miles off the coast of Brazoria County, Texas, in a water depth of 104 ft. The fixed platforms will be constructed with one (1) 4-pile metering platform with Surge System and one (1) 4-pile quarters and VTC Radar Room platform equipped with sleeping accommodations for 20 personnel, with room for a 20-person temporary living quarters to house extra personnel. This fixed platform will also include the helideck. The two fixed platforms will be connected via a personnel walkway.
- The port will utilize two (2) single point mooring buoys (SPMs), each having: two (2) 24-inch inside diameter crude oil subsea hoses interconnecting with the crude oil pipeline end manifold (PLEM); two (2) 24-inch inside diameter floating crude oil hoses connecting the moored VLCC or other crude oil carrier for loading to the SPM buoy; The floating hoses will be approximately 1,100 ft.in length and rated for 275 psig (18.9 bar). Each floating hose will contain an additional 110 ft. of 16-inch "rail tail hose" that is designed to be lifted and robust enough for hanging over the edge railing of the VLCC or other crude oil carrier. The subsea hoses would be approximately 160 ft.in length and rated for 275 psig (18.9 bar).
- Two (2) PLEMS would provide the interconnection between the pipelines and the SPM buoys. Each SPM buoy would have one (1) PLEM for crude oil export. Each crude oil loading PLEM would be supplied with crude oil by one (1) 42-inch outside diameter pipeline, each approximately 1.25 nautical miles in length.

The Deepwater Port onshore storage components will consist of the following:

- Newly installed 9.45 statute miles of 36” pipeline from the Department of Energy (DOE) facility at Bryan Mound to the Texas GulfLink Jones Creek tank storage terminal.
- The proposed Jones Creek Terminal located in Brazoria County, Texas, on approximately 200 acres of land consisting of eight (8) aboveground storage tanks, each with a total storage capacity of 685,000 barrels (660,957 barrels working storage capacity), for a total onshore storage capacity of approximately 6 million barrels (5.3 million barrels working storage) of crude oil. The facility can accommodate five (5) additional tanks, bringing the total to thirteen (13) or 9.8 million barrels of shell capacity with 8.6 million barrels of working capacity, should commercial drivers dictate.
- The Jones Creek Terminal will also include: six (6) electric-driven mainline crude oil pumps; three (3) electric driven booster crude oil pumps; one (1) crude oil pipeline pig launcher; one (1) crude oil pipeline pig receiver; two (2) measurement skids for measuring incoming crude oil - one (1) skid located at the incoming pipeline from the Bryan Mound facility, and one (1) skid installed for the outgoing crude oil barrels leaving the tank storage to be loaded on the VLCC; and ancillary facilities to include an operations control center, electrical substation, offices, and warehouse building.

Project Reference Sheet

Project Basics	
Project Name	Texas GulfLink (TGL)
Applicant	Texas GulfLink Holdings a Subsidiary of Sentinel Midstream LLC.
Deepwater Marine Terminal Location	Galveston Block 423 and Galveston Block A36
Onshore Terminal Location	Jones Creek, Brazoria County Texas
Receipt Pipeline	From the DOE Bryan Mound facility
Vessel Sizes	AFRAMAX (80 - 120 DWT) to VLCC (Very Large Crude Carrier) (160 - 320 DWT)
Throughput Capacity	1,000,000 BPD (Average 15 VLCCs per month)
Major Deepwater Port Components Offshore	
Crude Oil Subsea Export Pipeline	42" 12.45 statute miles (10.81 nm) of pipeline to the HDD beach. One 42" outside diameter pipeline 32.57 statute miles (28.3 nm) in length from the beach to the platform. Total pipeline length 45.02 statute miles.
	Maximum operating pressure 1480 psig, ASME 600#
	Pig launcher at the onshore terminal and a pig receiver at the offshore platform
	Pipeline to be buried a minimum 3 ft. below the mud line and a minimum 10 ft. below the mudline in the shipping fairways
Meter Platform and Quarters Platform Manned	One (1) 4 pile metering platform with Surge System and One (1) 4 pile quarters and VTC Radar Room platform with sleeping accommodations for 20 personnel with room for a 20-person temporary living quarters
	One (1) incoming 42” pipeline with pig receiver
	Two departing 42" pipelines, 1.43 statute miles (1.25 nm) to each SPM (single point mooring). 285 psig, ASME 150# rating
	One Custody Transfer Metering System rated for 85,000 BPH with a displacement prover and an automatic sampling system
	Living quarters to accommodate 20 personnel
	Surge valve and tank for pipeline and marine hose pressure protection, Surge Valve set point is 175 psig to protect marine loading hoses which are rated at 275 psig.
	Helicopter deck
	24/7 manned port radar and security camera control room for the proposed safety zone monitoring
Single Point Mooring (SPM) 2	CALM (Catenary Anchored Leg Mooring) system Chinese Lantern Underbuoy hose Configuration under
	Each approximately 1.43 statute miles (1.25 nm) (7,595.14') from the platform and 1.5 statute miles (1.32nm) (8,020') apart from each other
	One (1) PLEM Pipeline End Manifold for each SPM
	Two (2) 24" subsea underbuoy hoses from the PLEM to the CALM SPM

	Two (2) 24" floating hoses approximately 1100' long with an additional 110 ft. of 16" rail tail hose extending from the CALM SPM to be connected to the vessel's Center Bow Manifold (per SPM) with a marine breakaway coupling. Each floating hose string will have a blank flange and a shutoff valve at the vessel's manifold end.
	Two (2) mooring hawser lines with 76 mm chain to be connected to the vessel's bow chain stoppers
	Onboard SPM load monitoring system with a radio connection to the Port Security Control Room
Crude Oil Loading Pipelines	42" OD pipeline from the Platform to each PLEM/SPM buoy
	Each approximately 1.25 nautical miles (7,595.14') in length from the Platform to the PLEM
	Maximum operating pressure 285 psig (Pressure rating of SPM hoses)
	Buried 3 ft. below the mudline and a minimum of 10' below the mudline in the shipping fairway
Onshore Jones Creek Terminal	
Incoming Pipeline	9.45 miles of 36" pipeline, originating at the DOE Bryan Mound facility, with market connectivity to Houston.
	Maximum flow rate of 60,000 BPH (1.4 million BPD)
Incoming Meters	Custody Transfer Meters rated for 60,000 BPH
	Shared displacement prover (shared with outgoing meter system)
	Automatic Sampling System
Above Ground Tank Storage	The Proposed onshore terminal will initially have 8 tanks. The proposed tanks are 300' diameter by 60' high external floating roof tanks. The facility can be expanded to include 13 tanks.
	Each proposed tank will have the following volume capacity. Shell Capacity = 755,379 bbls Storage Capacity = 708,168 bbls Working Capacity = 667,251 bbls
	8 Tanks total capacity: Total Shell Capacity = 6,043,032 bbls Total Storage Capacity = 5,665,344 bbls Total Working Capacity = 5,338,008 bbls
Outgoing Meters	Meter system rated for 85,000 BPH to be used for line surveillance on the 42" pipeline to the Offshore Platform
	Designed for full flow and minimum flow rate during start up and vessel topping off Shared displacement prover (shared with incoming meter system)
Tank Booster Pump	Three (3) vertical turbine booster pumps, will provide suction pressure to mainline pumps with soft start capability. 1500 to 2000 HP each
	Booster Pumps will be in parallel
	50% redundancy at 65,000 BPH, capable of 85,000 BPH with all pumps operating

	Located between the tanks and the outgoing meter system
Mainline Pumps	Six (6) horizontal centrifugal pumps with Variable speed control 6000 to 8000 HP each
	Mainline pumps will be in series
	50% redundancy at 65,000 BPH, capable of 85,000 BPH with all pumps operating
	located downstream of the outgoing meters and upstream of the 42" pipeline pig launcher
Operations Control Center	24/7 manned operation control center with 2 control desks (1 for tank farm receipts and one for vessel loading)
	SCADA system to operate the entire receipt and loading system with pipeline surveillance and rupture detection
	Microwave communication system between the onshore facility and the offshore platform with satellite VSAT backup

33 CFR §148.105(a) Applicant, Affiliate, and Consultant Information

§148.105(a)(1) Identities of the Applicant, Affiliate(s), and Consultant(s)

The name, address, telephone number, citizenship, and principal business activity of the applicant and its affiliates.

This section provides corporate information on Texas GulfLink, LLC and its affiliates, as defined in 33 CFR §148.105. Additional information regarding Texas GulfLink, LLC and its affiliates is provided in Volume V, Appendix A, Corporate Organization Chart & Information [**Confidential**].

Name of Applicant	Texas GulfLink, LLC
Address	8333 Douglas Avenue, Suite 400 Dallas, TX 75225
Telephone	(214) 666-5385
Citizenship	United States (Texas)
Principal Business Activity	Texas GulfLink, LLC was formed for the purpose of developing, licensing, owning, constructing, and operating a deepwater crude oil export terminal to service the energy export market.
Affiliate of Applicant	Texas GulfLink Holdings, LLC
Address	8333 Douglas Avenue, Suite 400 Dallas, TX 75225
Telephone	(214) 666-5385
Citizenship	United States (Delaware)
Principal Business Activity	Texas GulfLink Holdings, LLC is the sole member of Texas GulfLink, LLC
Affiliate of Applicant	Sentinel Midstream, LLC Sentinel Midstream Management, LLC Sentinel Midstream Member, LLC Sentinel Midstream Holdings, LLC
Address	8333 Douglas Avenue, Suite 400 Dallas, TX 75225
Telephone	(214) 666-5385
Citizenship	United States (Delaware)
Principal Business Activity	Sentinel Midstream, LLC is the sole member of Texas GulfLink Holdings, LLC. The remaining Sentinel entities are either owned in common interest with Texas GulfLink, LLC or are its parent companies. Sentinel provides midstream solutions for crude oil gathering, storage, and terminaling as well as natural gas gathering, processing and treating.
Affiliate of Applicant	Cresta Energy Sentinel Aggregator, LLC Cresta Energy Fund I Carry, LP Cresta Energy Fund I, LP
Address	8333 Douglas Avenue, Suite 400 Dallas, TX 75225
Telephone	(214) 310-1230
Citizenship	United States (Delaware)
Principal Business Activity	Cresta Energy Fund I, LP is a middle-market focused private equity firm with a conservative, value-added approach to infrastructure investing. Cresta invests in hard asset transportation, storage, and processing businesses primarily in the energy, chemicals, and water sectors.

Information about the engineering and consulting firms currently working on the Texas GulfLink Project is provided below under §148.105(b), Experience Related to DWPs, and §148.105(c), Engineering Firms.

§148.105(a)(2) Identities of Applicant's Subsidiaries and Divisions

The name, address, and principal business activity of each subsidiary, division of the applicant, or its affiliates that participated in the decision to apply for a license to build a deepwater port.

Sentinel Midstream, LLC and Cresta Energy Fund I, LP participated in the decision to form Texas GulfLink, LLC in order to apply for a license to construct, own, and operate the Texas GulfLink Project. Texas GulfLink, LLC currently has no subsidiaries. Contact information, including name, address, and principal business activity of these participants is listed in §148.105(a)(1) above.

§148.105(a)(3) Affiliate Relationship(s) to Applicant

A description of how each affiliate is associated with the applicant, and of the ownership interest each affiliate has in the applicant.

Texas GulfLink, LLC is a Texas limited liability company established to develop, permit, own, construct, and operate the proposed Texas GulfLink Project. Texas GulfLink, LLC is a wholly-owned subsidiary of Sentinel Midstream, LLC. Sentinel Midstream and its parent and affiliate entities are ultimately owned by Cresta Energy Fund I, LP and Cresta Energy Fund I Carry, LP. A description of each affiliate, as defined by 33 CFR §148.5, and its respective ownership interest in Texas GulfLink, LLC is provided above, as well as in Volume V, Appendix A, Corporate Organization Chart & Information [**Confidential**]; *see also* Volume V, Appendix B, Affidavits of US Citizenship [**Confidential**].

§148.105(a)(4) Corporate Officers and Directors

A list of the applicant's corporate officers and directors, and each affiliate that participated in the decision to apply for a license.

As described above, Sentinel Midstream, LLC and Cresta Energy Fund I, LP and its managers and officers participated in the decision to apply for a license to construct, own, and operate the Texas GulfLink Project. Texas GulfLink, LLC was created in 2019 to develop, license, own, construct, and operate a deepwater crude oil export terminal to service the energy export market.

Table 1 provides the names and titles of the current officers and directors of Texas GulfLink, LLC. Information about the engineering and consulting firms currently working on the Texas GulfLink Project is provided below under §148.105(b), Experience Related to Deepwater Ports, and §148.105(c), Engineering Firms. Additional information regarding Texas GulfLink, LLC and its Corporate Officers is provided in Volume V, Appendix B, Affidavits of US Citizenship [**Confidential**].

Table 2 provides the names of each affiliate that participated in the decision to apply for a license.

Table 1: Corporate Officers and Directors of Texas GulfLink, LLC

Title	Name
President and Chief Executive Officer	Jeff Ballard
Chief Financial Officer	Blair Mathews
Chief Operating Officer	Brad Ramsey
Director of Engineering	Keith Pollock
Director of Marine Operations	Capt. Daniel Harris

Table 2: Affiliates of Texas GulfLink, LLC

Name of Affiliate Participating in Decision	Relationship to Texas GulfLink
Texas GulfLink Holdings, LLC	See §148.105(a)(1), above.
Sentinel Midstream, LLC	See §148.105(a)(1), above.
Sentinel Midstream Holdings, LLC	See §148.105(a)(1), above.
Sentinel Midstream Management, LLC	See §148.105(a)(1), above.
Sentinel Midstream Member, LLC	See §148.105(a)(1), above.
Cresta Energy Sentinel Aggregator, LLC	See §148.105(a)(1), above.
Cresta Energy Fund I, LP	See §148.105(a)(1), above.
Cresta Energy Fund I Carry, LP	See §148.105(a)(1), above.

§148.105(a)(5) Applicant's and Affiliates' Five-Year Histories

A statement for each applicant or affiliate, providing complete and detailed information on any civil or criminal legal proceeding during the preceding 5 years that relates to, or that could materially affect, information in the license application.

Neither Texas GulfLink, LLC, nor its affiliates, have been subject to any civil or criminal legal proceedings during the preceding five years that relate to, or could materially affect, information provided in this application. Neither Texas GulfLink, LLC, nor its affiliates, have filed for protection under bankruptcy laws or has been party to any litigation during the past five years that relates to, or could materially affect, the construction, ownership or operation of the Texas GulfLink Project.

§148.105(a)(6) Lobbying Activities, 31 U.S.C. §1352

A declaration by the applicant that neither the applicant nor its affiliate has engaged in any lobbying activities that are prohibited by 31 U.S.C. §1352 or any other applicable Federal anti-lobbying statute.

Neither Texas GulfLink, LLC, nor any of its affiliates, have engaged in any lobbying activities that are prohibited by 31 U.S.C. §1352 or any other applicable Federal anti-lobbying statute.

33 CFR §148.105(b) Experience Related to Deepwater Ports

§148.105(b)(1) Offshore Operations Experience

A description of the applicant's, affiliate's, and consultant's experience in offshore operations, particularly operations involving the transfer and storage of liquid cargo, and the loading and unloading of vessels.

This section provides an overview of the Texas GulfLink Team's experience related to offshore operations, which is comprised of various members of Texas GulfLink affiliates and consultants. Additional information about the Texas GulfLink team is provided in Volume V, Appendix A, Corporate Organization Chart & Information [**Confidential**].

The Texas GulfLink project team comprises an exclusive grouping of individuals with specific midstream and offshore oil and gas experiences. From commercial development to operations, the team has extensive experience designing, managing, and leading an organization that can store large volumes of crude oil in above ground storage facilities with pipeline connectivity to load VLCCs at an offshore Deepwater Port complex. Coupled with the financial backing of a private equity fund dedicated to investing in the energy midstream space, who also have extensive operating and management experience, the team is uniquely positioned to take this project from conceptual design, through permitting, and construction to commissioning.

TEXAS GULFLINK CORPORATE OFFICERS & DIRECTORS

Jeff Ballard **President & Chief Executive Officer**

Jeff Ballard founded Sentinel Midstream, parent company of Texas GulfLink, in May 2018, and has over 12 years of experience in the midstream sector with a successful track record in business development, commercial operations, and contract negotiation. He has led the development and execution of commercial and business development projects for crude oil and natural gas gathering, treating, processing, and storage terminals in various basins across the United States, most recently in the Permian and Rockies Basins.

Prior to founding Sentinel Midstream, Mr. Ballard served as Director of Business Development at Silver Creek Midstream, assisting in multiple acquisitions and greenfield development projects in the Powder River and Big Horn Basins. Before Silver Creek Midstream, he served as Manager of Business Development at JP Energy Partners and its successor American Midstream Partners where he was responsible for commercial growth and business development in the Permian and Delaware Basins. Previous to JP Energy Partners, Mr. Ballard held the role of Senior Commercial at Pioneer Natural Resources, Midstream Eagle Ford division, and its successor Enterprise Products. He also held various commercial positions at Energy Transfer Partners.

Mr. Ballard honorably served in the United States Army and is an Operation Iraqi Freedom Combat Veteran. After exiting the Army, he earned a Bachelor of Business Administration in Marketing and Management from Dallas Baptist University.

Brad Ramsey **Chief Operating Officer**

Brad Ramsey has over 25 years of engineering, construction, and operations experience in the upstream, midstream, and downstream energy sectors with Koch, Valero, NuStar Energy, Easton Energy, and multiple energy infrastructure construction companies. Mr. Ramsey has in-depth midstream experience in the crude, natural gas, natural gas liquids, and refined products business segments where he developed teams to execute several billion in capital projects in the United States, Great Britain, the Netherlands, Canada, Mexico, and the Caribbean.

As VP of Engineering at NuStar Energy, L.P., Mr. Ramsey:

- Constructed over 100 storage tanks in 6 countries and 12 US states totaling over 16 million barrels.
- Built 2 crude rail facilities at St. James, LA, each capable of offloading 120 car unit trains in 6 hours.
- Designed and built grass roots crude terminals with truck, rail, pipeline, and marine connectivity.
- Constructed and revamped numerous Docks in Corpus Christi, TX; Texas City, TX; Savannah, GA; St. James, LA; Amsterdam, The Netherlands, and other locations.
- Constructed numerous cross-country pipeline projects managing design, engineering, hydraulics, surveying, land acquisition, procurement, construction, and commissioning.
- Helped with construction, operations, and maintenance of the NuStar St. Eustatius Single Point Mooring (SPM) system, capable of crude oil loading rates up to 100,000 barrels per hour.

He has established and managed two grass roots construction companies specializing in midstream pipeline and facility construction. Mr. Ramsey served as Chief Operating Officer of Easton Energy which operates over 400 miles of natural gas liquids (NGL) pipelines and has managed multiple groups responsible for safety, permitting, and regulatory compliance.

Mr. Ramsey holds a Mechanical Engineering degree from the University of Kansas.

Blair Mathews **Chief Financial Officer**

Blair Mathews has over 12 years of experience in the upstream and midstream sectors with a focus on financial planning and analysis, transaction and contract negotiation, and acquisitions and divestitures. Before becoming Chief Financial Officer at Texas GulfLink, he served as Business Development Director at EXCO Resources (“EXCO”) where he was responsible for leading the acquisition and divestiture efforts for EXCO’s upstream and midstream assets across multiple areas.

As Mr. Mathews reported directly to EXCO’s CEO before transitioning to Texas GulfLink, Mr. Mathews was tasked with the strategic planning and execution of key company initiatives. During his 11 years at EXCO, he worked in various positions in the financial planning and analysis group where he focused on financial forecasting for EXCO’s midstream equity investment, TGGT. In addition to leading the divestiture of TGGT for $910 million, he led the financial evaluation and negotiation of multiple successful upstream acquisitions and divestitures on EXCO’s behalf. He led the financial portion of the TGGT credit facility to the bank group in order to establish TGGT’s initial credit facility of $500 million. Among other initiatives, he assisted in a $750 million bond offering for EXCO, two strategic joint ventures with BG Group in excess of $1 billion, and was heavily involved in EXCO’s attempted go-private.

Before transitioning to the oil and gas industry, Mr. Mathews worked at Ernst & Young in the financial valuation group and in business development efforts in the transaction advisory services practice. He performed business valuation for purposes of transactional analysis, purchase price allocation, goodwill impairment testing, and litigation support.

Mr. Mathews holds a Bachelor of Business Administration degree in Finance from Baylor University.

Keith W. Pollock Director of Engineering

Mr. Pollock serves as Texas GulfLink's Project Manager and Construction Operations Manager with extensive international and domestic experience in areas concerning Pipeline Onshore & Offshore/ Offshore Oil & Gas Construction / Civil Infrastructure. Before joining Texas GulfLink, he served as Operations Manager where he managed daily operations while simultaneously managing multiple large-scale construction projects, and developed and implemented processes for the company to facilitate more accurate and efficient accounting, project management, and operations practices.

During his time as a Project Manager at Chevron, he managed all aspects of large-scale capital projects ($50M-$150M+) with a median execution range of 2+ years, and managed onshore pipeline and facility installation from concept to pre-commissioning and handover to operations. He has also served as a Senior Project Engineer with Cal Dive International where he managed all areas of shallow water pipeline installation/salvage, platform installation/salvage, topside hook-up, and onshore fabrication.

Mr. Pollock holds a Bachelor of Science in Mechanical Engineering from Texas A&M University.

Capt. Daniel Harris Director of Marine Operations

Capt. Harris previously served as a Louisiana Offshore Oil Port (LOOP) Mooring Master where he personally handled over 2000 VLCC moorings and a half dozen SPM loading operations. Capt. Harris also spent 20 years sailing US flag tankers, mostly on the West coast for BP in the Alaska TAPS trade. Capt. Harris has extensive shipyard experience with tankers and Military Sealift Command (MSC) vessels and was an accredited OCIMF SIRE Vetting Inspector with over 300 inspections. He has spent approximately two years as BP's Port Captain for the southeast and Gulf Coast region and traveled to South America to attend high-risk tanker operations, mostly in Brazil. He also has extensive shipyard experience including Builders Trials, Dock Trials, and Sea Trials. Career highlights include:

- 18 Years as Mooring Master with service on ULCC and VLCC
- 2000+ mooring/unmooring - SPM
- Accredited OCIMF SIRE Vetting Inspector with 300+ inspections (BP/Exxon/Shell) 1999-2001
- Mooring Masters' representative LOOP expansion project 2005
- Current U.S. Coast Guard Masters License Unlimited Oceans
- Broad Shipyard experience including; Builders Trials, Dock Trials, Sea Trials, Structural Inspections, Coating Inspections, and Safety Meetings. (Newport News; Portland, OR; and Singapore yards)
- BP Port Captain SE & Gulf Coast (1999-2000), office Alliance Refinery Belle Chase, LA
- 20 Years sailing tankers, including 15 years (TAPS trade) Alaska/West Coast (1.2 million bbl tanker), First Class Pilot Prince William Sound
- Captain of MSC Vessel in Desert Strom Operation with 3 voyages to Persian Gulf with military cargo, 1990
- 6 VLCC loadings as Mooring Master/PIC, SPM operation at LOOP 2018

He holds a B.S. from New York Maritime Academy in Marine Transportation, 1978.

TEXAS GULFLINK TEAM

Tyler M. Abadie, P.E. Engineering, Operations, Regulatory Compliance

As founder and Chief Executive Officer of Abadie-Williams, Mr. Abadie is directly involved in day-to-day activities, working with functional departments, and assisting client executives. He has been involved as an owner's rep, strategic consultant, and due diligence advisor for over $450 million dollars' worth of acquisitions and divestments between major corporations and independent operators.

His experience and expertise has allowed an expanded consulting confidence in his clients, specifically, in areas such as marine terminal front-end engineering and design, deep water pipeline operations, abandonment and liability planning, Gulf of Mexico asset life extension, engineering assessments, integrity auditing, data management, CAPEX/OPEX planning, purchase sale agreements, facility sharing agreements, tariff generation, and regulatory compliance representation.

Mr. Abadie has directly managed CAPEX intensive projects throughout the Gulf of Mexico, Louisiana, and Texas; ranging from crude oil terminal and pump stations to large-scale deepwater pipeline diving operations.

Prior to starting Abadie-Williams, Mr. Abadie served as engineering and operations lead for Harvest-Marks Pipeline, a private equity joint venture, which acquired Chevron and British Petroleum Cypress Pipeline assets located within southeast Louisiana. Mr. Abadie worked directly with ownership to achieve revenue benchmarks and managed daily operations. Tyler facilitated the implementation of capital projects, new producer connections, an upgraded SCADA system, compliance management software, and represented the company in PHMSA/LDNR audits. Tyler eventually served as the technical and operational liaison between the divesting and acquisition parties.

Before his tenure in the midstream industry, Mr. Abadie worked as a contractor for companies such as Dow Chemical, OxyChem, Rolls Royce, NASA, Georgia-Pacific, Chevron GOMBU, Monsanto, International Paper, Buckeye, DuPont, and Shell.

Mr. Abadie holds a Bachelor of Science degree in Civil Engineering from Louisiana State University and is a licensed professional engineer in Texas and Louisiana.

Phillip A. Plaisance Operations and Oil Movements

As Chief Operating Officer of Abadie-Williams, Mr. Plaisance is responsible for oversight of the Abadie-Williams project managers within a matrix organization, ensuring continuity between engineering, operations, controls, and subject matter experts. He serves as a critical liaison between Abadie-Williams project managers and client representatives, interfacing this critical component for successful midstream project implementation.

Prior to joining Abadie-Williams, Mr. Plaisance served as the Manager of Oil Movements for The Louisiana Offshore Oil Port (LOOP), managing the operations control center and the scheduling department. The team was responsible for scheduling and offloading tankers calling on LOOP, receipts from the Mars Pipeline and the Endymion Pipeline. The average total volume of receipts was approximately 1.3 million barrels per day. The team also was responsible scheduling and moving 1.3 million barrels per day on the pipelines departing the Clovelly Hub.

From 2009 to 2010, he served as the Operations and Maintenance Superintendent of all of LOOP and LOCAP's onshore assets, interfacing with the offshore supervision to ensure safe and reliable operation of LOOP's 48" pipeline, from the Marine Terminal to the Clovelly Hub.

From 1998 to 2009, Plaisance served as the Instrumentation and Control Systems Supervisor at LOOP. Project Manager on multiple large-scale meter system upgrades at multiple locations. Project Manager for a complete Facility Upgrade Project at LOOP's Fourchon Booster Station, including the refurbishment of four 6,000 horse power pumps PLC replacement, and electrical substation upgrades. He was the Project Manager for multiple legacy PLC upgrades at the offshore and onshore facilities, including the storage caverns and the brine system.

From 1995 to 1997, he served as the District Engineer for Unocal Pipeline's Louisiana District, supporting new pipeline start-up on multiple offshore pipelines, valve replacement projects, and control system upgrades. In 1998, he became the acting Louisiana District Manager, responsible for the Whitecap Pipeline, which is an 18" pipeline that runs from Ship Shoal Block 208 to Ship Shoal Block 28 and is a main source of Louisiana Light Sweet Crude (LLS). Between 1993 to 1995, he served as a contract engineer, contract PLC design engineer for LOOP, working on the conversion of the 7,000 horse power electric pump drives to 7,400 horse power diesel-driven pump. He designed the PLCs for 3 of the 4 conversions.

He has served as the Incident Command System Planning Section Chief. Led the Planning Section to develop Incident Action Plans (IAP) for actual emergency responses and emergency response drills. Presented IAP to Federal, State, and local officials and achieved Unified Command approval of the IAP every time. Served as Incident Commander on two emergency responses. Developed customer and media communications protocol to be distributed during weather-related events and abnormal situations.

Mr. Plaisance holds a Bachelor of Science degree in Electrical Engineering from Louisiana State University.

Kyle M. Lawson Finance, Commercial, and Risk Management

As Chief Financial Officer of Abadie-Williams, Kyle Lawson is responsible for the financial, insurance, legal, and contractual oversight of all Abadie-Williams managed projects. He serves as a critical liaison between Abadie-Williams project managers and client's representatives, ensuring that their risks are minimized and their strategic fiscal objectives are achieved.

Before joining Abadie-Williams, Kyle served in various roles at the Louisiana Offshore Oil Port (LOOP), most recently in Business Development, responsible for ensuring shippers' contracts and commercial objectives were maximized. Kyle also served in Operations, as Process Improvement Analyst, where he utilized Lean and Six Sigma philosophies to achieve strategic organizational cost savings and increased efficiencies amongst the various business units. Also, while in the Operations group, Mr. Lawson gained valuable experience related to the offshore tanker, platform, SPM, pipeline oil movements and scheduling operations at LOOP. Prior to Operations, Kyle served in Accounting where he was responsible for developing the annual enterprise operating budget and corresponding financial reporting to owner companies. At the onset of his career, Kyle worked in Engineering as Cost Tracking Analyst responsible for monitoring, projecting, and reporting maintenance and capital project costs (estimated $1M-50M annually) to LOOP management. Mr. Lawson also served on the LOOP Emergency Response Team which followed the National Incident Management Systems (NIMS) Incident Management System (IMS), as a Type II-trained member to perform Documentation Unit Leader and Deputy Planning Section Chief responsibilities.

Kyle holds a Bachelor of Science degree in Management from Louisiana State University and a Master of Business Administration from the University of New Orleans.

Chuck J. Arnondin **Project Director**

As Project Director of Abadie-Williams' Corporate Projects and Deepwater Port Department, Mr. Arnondin has over 37 years of experience in the oil and gas industry as Engineer, Project Manager, and Manager of Engineering. Mr. Arnondin also has extensive experience working as a Subject Matter Expert on projects related to the transportation, storage, and measurement of crude oil, fuel oils, and natural gas liquids, as well as extensive experience with projects related to the design and construction of storage tanks, pipelines, meter stations, and salt dome storage cavern facilities.

Before joining Abadie-Williams, Mr. Arnondin worked as a Senior Project Manager with Boardwalk Louisiana Midstream, Audubon Engineering, and Louisiana Offshore Oil Port (LOOP). In these roles, he was directly responsible for the development of project budget, design, procurement & construction operations, and providing Project Management duties including the development of project objectives, associated budgets, schedules, execution plans, technical design requirements, multi-discipline contractor scopes or work, commercial contracts for fabrication and installation, commissioning plans, and review of final project documentation.

Mr. Arnondin holds a Bachelor of Science in Mechanical Engineering from Louisiana State University.

Tommy Laurendine, P.E. **Civil/Structural Engineering Manager**

Mr. Laurendine is the civil/structural engineering manager for Abadie-Williams. He acts as the supervisor for all structural and civil engineering activities for offshore and onshore client projects. He has extensive experience in the design, analysis, assessment, decommissioning, repair, and modifications of offshore platforms. Mr. Laurendine has been retained as the BSEE-approved Certified Verification Agent (CVA) for design review of assessment, modifications, and additions to earthquake platform in the Pacific Ocean and mudslide platforms in the Gulf of Mexico, as well as to provide expert opinion on offshore structural failures caused by mudslides in the Gulf of Mexico.

Mr. Laurendine has led accident investigations on offshore platform drilling rig failures and has been hired by several consulting firms to teach offshore structural engineering to staff civil engineers. He is an expert in BSEE and Coast Guard regulations having worked as Chief, Office of Structural and Technical Support, for MMS.

Mr. Laurendine also served as a Project Manager for first-in-place, rigs-to-reef project, clearing the way to save money on future decommissioning projects in the Gulf of Mexico. He has extensive experience with corrosion damage repairs and mitigation development planning. He has also been selected as an expert to review technical papers and literature on offshore structural engineering research, design & analysis, and decommissioning.

Mr. Laurendine holds a Bachelor of Science in Civil Engineering and a Master of Science in Civil Engineering from the University of New Orleans. He is a licensed professional engineer in the States of Texas and Louisiana.

Earl F. Verdin **Senior Marine/Offshore Project SME**

Mr. Verdin is a Senior Project Manager and Subject Matter Expert within the Operations Department of Abadie-Williams. He is a professional in the oil and gas offshore industry with extensive experience in project engineering, cost estimating, proposal preparation, contract negotiations, project execution, and project management for the design, fabrication, transportation, and installation of domestic and international deep-water offshore facilities.

Before joining Abadie-Williams, Mr. Verdin worked for McDermott for over 31 years, and acted as PMT and Estimating, Pursuit Manager, Construction Advisor, (Senior) Project Manager, and Project Engineer for a variety of Oil & Gas projects all over the world. These projects include, but were not limited to: Anadarko Red Hawk Spar, Williams Energy Services Gulf Star, PEMEX Ayastil, PDVSA Perla, Chevron USA Tahiti, Noble Energy Lorien, NW Hutton Salvage, Chevron USA Petronius, Shell Auger, Exxon USA Harmony and Heritage, and Texaco Petronius Compliant Tower.

Mr. Verdin has also published as co-author of the paper, *Neptune Project: Spar Hull, Mooring, and Topsides Installation* presented at the Offshore Technology Conference.

Mr. Verdin holds a Bachelor of Science in Petroleum Engineering Technology – Nicholls State University.

Edwin M. Stanton, CAPT, USCG (Ret) Environmental & Regulatory Compliance

Captain Edwin Stanton is a Maritime & Environmental subject matter expert within the Strategic Consulting Department of Abadie-Williams. Mr. Stanton is a retired Coast Guard Captain who served 36 years of active duty in the Coast Guard. He has served as Executive Officer of the Coast Guard Atlantic Area Strike Team and Commanding Officer of the Coast Guard Gulf Strike Team, a specialized oil and hazmat team; Chief of Port Operations and Executive Officer of Marine Safety Office, San Juan, Puerto Rico; Chief of the Response Division of Eighth Coast Guard District in New Orleans; Chief of the Office of Response at Coast Guard HQ; Vice Chair of the National Response Team; Co-Chair of Regional Response Teams in Federal Regions IV, V, VI, VII, and VIII; Deputy Commander and Commander, Sector Mobile, Alabama; Commander, Sector New Orleans. He was Incident Commander for the Macondo well blowout in Houma, LA.

Mr. Stanton has responded to the major oil discharge from the Tank Barge MORRIS J BERMANN, in Puerto Rico; the Tanker JESSICA oil discharge in the Galapagos Islands; the crash of the Shuttle COLUMBIA; anthrax contamination of post offices and the AMI building in Boca Raton, Florida; Hurricanes HUGO, KATRINA, GUSTAV; the discharge of oil from the Motor Vessel WESTCHESTER in the Mississippi River; the discharge of oil into the Gulf of Mexico from the T/V MEGA BORG; the discharge of oil into Galveston Bay from the Tank Barge APEX; and many others. He was the Coast Guard subject matter expert in environmental response for the North Atlantic Coast Guard Forum for three years and has lectured on emergency response and oil spill response in many forums, domestic and international.

Mr. Stanton has authored regulations and policy for the Coast Guard; performed duties as a Marine Casualty Investigator; Marine Inspector; Pollution Investigator; Port Operations and Waterways Management specialist; and Hazardous Cargo specialist. As a Sector Commander, he exercised the duties of Federal On-Scene Coordinator; Federal Maritime Security Coordinator; Search and Rescue Mission Coordinator; Officer-in-Charge, Marine Inspection; and Captain of the Port. His duties included the oversight of many operations in the Gulf of Mexico, including the Louisiana Offshore Oil Port.

Following the Coast Guard, Mr. Stanton worked as Vice President, Emergency Management for Witt-O'Brien's until 2016, where he directed incident operations for owners and operators of vessels, oil exploration and production facilities, pipeline companies, and oil storage facilities.

His educational experience includes:

- USCG Recruit Training, Cape May, NJ
- USCG Officer Candidate School, Yorktown, VA
- Port Safety Industry Training, Port of New Orleans, LA
- Associates Degree, University of Phoenix

- Marine Safety Basic Indoctrination Course
- Mobile Offshore Drilling Unit Inspection Course
- USCG On-Scene Coordinator Crisis Management Course
- Various Incident Management, Planning, Inspection, Port Ops, Hazmat Courses
- EPA Environmental Response courses

CRESTA TEAM

Chris D. Rozzell Managing Partner

Mr. Rozzell has 19 years of investment and operating experience in the energy industry, and he co-founded Cresta Energy Fund in 2016. At Cresta, Mr. Rozzell's primary responsibilities include transaction sourcing, transaction execution, and portfolio management as well as management of the Firm. He currently serves as a Director of NAmerico Energy Holdings and Lynx Terminals. Prior to co-founding Cresta, he served as Chief Executive Officer of Wildcat Midstream Holdings, a middle market investment holding company focused on the energy midstream space. He joined Wildcat from Regency Energy Partners, where he served as Executive Vice President and Chief Commercial Officer, managing the company's efforts in commercial project development, acquisitions, gas supply, marketing, scheduling, and gas control. Prior to Regency, he held managerial positions in the strategic planning, development, and enterprise risk groups of TXU Corp, and worked in the Investment Banking division of Bear, Stearns & Co. Inc.

Chris holds a B.B.A in Finance from Southern Methodist University.

David T. Miller, P.E. Partner

Mr. Miller has 24 Years of operating and investment experience in the energy industry, co-founding Cresta in 2016. At Cresta, Mr. Miller's primary responsibilities include transaction sourcing, diligence, and portfolio management. He currently serves as a Director of NAmerico Energy Holdings, Cornerstone Midstream, and Ocelot Energy Management. Prior to co-founding Cresta, he served as Chief Operations Officer of Wildcat Midstream Holdings, a middle market investment holding company, focused on the energy midstream space. He joined Wildcat from Regency Energy Partners where he served as Vice President of Operations and Engineering, responsible for staffing, budgeting, maintenance, operations, and technical support for the midstream company's gathering, processing, and transmission assets. Prior to Regency, he held various management and senior operations and engineering positions with the XTO Energy and Aquila Gas Pipeline Corporation.

David holds a B.S. in Civil Engineering from the University of Texas at Arlington. He is a Registered Professional Engineer in the State of Texas.

Drew Armstrong Partner

Mr. Armstrong has over 14 years of finance and acquisitions experience in the energy industry, co-founding Cresta in 2016. At Cresta, Mr. Armstrong's primary responsibilities include transaction sourcing, transaction execution, and portfolio management. He currently serves as Director of NAmerico Energy Holdings, Cornerstone Midstream and Sentinel Midstream. Prior to co-founding Cresta, he served as Chief Financial Officer of Wildcat Midstream Holdings, a middle market investment holding company, focused on the energy midstream space. Prior to joining Wildcat, Drew was responsible for overseeing all mergers and acquisitions activity for Regency Energy Partners. During his time at Regency, the company completed approximately two billion dollars of acquisitions. Prior to joining Regency Energy Partners, Drew worked

in the corporate planning group at TXU, where he managed the sell-side forecasting process during the KKR-led leveraged buyout of TXU in 2007. Prior to TXU, Drew begin his career in E&P commercial lending at Bank of Texas.

Drew holds a M.B.A. from Southern Methodist University and a B.B.A in Finance from Oklahoma State University.

Wade Webber Vice President

Mr. Webber joined Cresta in 2017, as a Vice President. He concentrates on transaction analysis and execution, portfolio monitoring, and deal sourcing. Prior to joining Cresta, Mr. Webber worked on the investment team at NGP Energy Capital, making midstream and upstream investments in the oil and gas industry. Prior to NGP, Mr. Webber was an investment banking analyst with Bank of America Merrill Lynch's Energy Group in Houston.

Mr. Webber graduated cum laude from Brigham Young University with a Bachelor of Science in Accounting.

§148.105(b)(2) Contracted Affiliates' Marine and Offshore Construction Experience and Qualifications

For each affiliate that has a significant contract with the applicant for construction of the deepwater port, a description of that affiliate's experience in construction of marine terminal facilities, offshore structures, underwater pipelines, and seabed foundations; in addition to a description of other experiences that would bear on the affiliate's qualification to participate in the construction of a deepwater port.

At this time, neither Texas GulfLink, nor any of its affiliates, have entered into any contracts related to the construction of the deepwater port. At such time when contracts are executed, Texas GulfLink will promptly notify MARAD and the U.S. Coast Guard, and provide information required under §148.105(b)(2) describing that affiliate's experience in construction of marine terminal facilities, offshore structures, underwater pipelines, and seabed foundations, along with any other information bearing upon their qualifications. Any contractor providing construction services to the Texas GulfLink Project will be vetted for extensive offshore experience and expertise fitting a project of this nature.

33 CFR §148.105(c) Engineering Firms

For each engineering firm, if known, that will design the deepwater port or a portion of the port, the application must include the firm's (1) Name; (2) Address; (3) Citizenship; (4) Telephone number; and (5) Qualifications.

The following licensed Engineering Firms have contributed subject matter expertise, front end engineering and design, strategic consulting, field operations, and environmental services for the Texas GulfLink project and Maritime Administration (MARAD) Deepwater Port Licensing Application. Further information on each Engineering Firm's qualifications can be found in Volume IV, Appendix A, Engineering Qualifications [**Confidential**].

Engineering Firm:	Abadie-Williams LLC
Licensing:	Texas Firm #20800, Louisiana Firm #5949
Citizenship:	United States (USA)
Address:	1 Galleria Blvd. Suite 1680 Metairie, LA 70001
Number:	(504) 834-3040
Services Provided:	Front End Engineering & Design, Owner's Representative Engineer, MARAD Application and Regulatory Permitting Preparation and Agent, Deepwater Port Consulting, Offshore Marine Terminal Preliminary Layout and Pipeline Routing, Import/Export Midstream Operations Subject Matter Expertise, Oil Spill Response Planning, Risk Assessment, Port Security Planning, CAPEX/OPEX Financial Modeling, Commercial Consulting, Project Management, Procurement Services, and Controls.
Qualifications:	See Volume IV, Appendix A, Engineering Qualifications [**Confidential**].

Engineering Firm:	C-K Associates, LLC
Licensing:	Texas Firm #9628, Louisiana Firm #3075
Citizenship:	United States (USA)
Address:	8591 United Plaza Blvd., Suite 300 Baton Rouge, LA 70809
Number:	(225) 755-1000
Services Provided:	Environmental Consulting, Lead Environmental Impact Assessment (EIA) for Onshore/Offshore Analysis, Alternative Site Analysis, Air Dispersion Modeling, Title V Emission Modeling, Wetland Delineation, Wetland Mitigation, Air, Water, and Wetland Permit Drafting, Federal & State Permitting Consultant.
Qualifications:	See Volume IV, Appendix A, Engineering Qualifications [**Confidential**].

Engineering Firm:	Clement Control Systems, Inc.
Licensing:	Louisiana Firm #3868
Citizenship:	United States (USA)

Address:	880 West Commerce Road, Suite 501 New Orleans, LA 70123
Number:	(504) 733-5323
Services Provided:	Conceptual Deepwater Port Control Systems/SCADA Architecture
Qualifications:	See Volume IV, Appendix A, Engineering Qualifications [**Confidential**].

Engineering Firm:	Fugro USA Marine, Inc.
Licensing:	Texas Firm #4719
Citizenship:	United States (USA)
Address:	6100 Hillcroft, 3rd Floor Houston, TX 77081
Number:	(713) 369-5572
Services Provided:	Desktop Engineering for an Analysis of the General Characteristics of the Ocean Bottom, Sub-Bottom, and Upland soils throughout the Marine Site through existing data. Offshore Soil Mechanic Engineering.
Description:	See Volume IV, Appendix A, Engineering Qualifications [**Confidential**].

Engineering Firm:	Keystone Engineering Inc.
Licensing:	Texas Firm #7272, Louisiana Firm #1460
Citizenship:	United States (USA)
Address:	1100 West Causeway Approach Mandeville, LA 70471
Number:	(985) 626-4020
Services Provided:	Front End Engineering & Design for Offshore Platform General Arrangement, and Preliminary Platform Structural Analysis
Qualifications:	See Volume IV, Appendix A, Engineering Qualifications [**Confidential**].

Engineering Firm:	Laney Group Inc.
Licensing:	Texas Firm #13329
Citizenship:	United States (USA)
Address:	831 Crossbridge Drive Spring, TX 77373
Number:	(281) 540-6615
Services Provided:	Preliminary Horizontal Directional Drill (HDD) Onshore Pipeline Crossing Engineering, Design, & Routing, Typical Construction Methodology for Horizontal Directional Drill (HDD) Pipeline Installation.
Qualifications:	See Volume IV, Appendix A, Engineering Qualifications [**Confidential**].

Engineering Firm:	Morris P. Hebert, Inc.
Licensing:	Texas Firm #8039
Citizenship:	United States (USA)
Address:	10101 Southwest Fwy Ste 400 Houston, TX 77074
Number:	(713) 219-1470
Services Provided:	Preliminary Onshore Storage Terminal Drainage Study & Planning, Onshore Storage Terminal Cut/Fill Analysis for USACE Permitting, Onshore Terminal Land Surveying.
Qualifications:	See Volume IV, Appendix A, Engineering Qualifications [**Confidential**].

Engineering Firm:	T. Baker Smith, LLC
Licensing:	Texas Firm #6084, Louisiana Firm #3388
Citizenship:	United States (USA)
Address:	412 S Van Avenue Houma, LA 70363
Number:	(985) 868-1050
Services Provided:	Preliminary Offshore Pipeline Routing, Offshore Reconnaissance Survey, Offshore Hazard Survey, Offshore Archaeological Survey Project Management, Offshore BOEM/BSEE Block Verification, Preliminary Offshore Mapping & GIS Services
Qualifications:	See Volume IV, Appendix A, Engineering Qualifications [**Confidential**].

The following non-engineering consultants were also utilized in various deepwater port components for their various subject matter expertise. Further corporate qualifications can be furnished upon request.

Table 3. Non-Engineering Consultants

Company	Country	Address	Telephone	Role
CSA Ocean Sciences	USA	8502 SW Kansas Ave Stuart, FL	(772) 219-3000	Offshore Environmental Impact Assessment
BGE Environmental Services Group	USA	One Sugar Creek Center Boulevard Suite 475 Sugar Land, TX 77478	(281) 207-1930	Onshore Environmental Impact Assessment
Search	USA	315 NW 138th Terrace Newberry, FL 32669	(352) 333-0049	Archaeology and Cultural Resources management
The Compliance Group	USA	14884 Hwy. 105 West, Suite 100 Montgomery, TX 77356	(936) 447-6100	HSE, PHMSA, DOT compliance consultant
The Response Group	USA	13939 Telge Rd. Cypress, TX 77429	(281) 880-5000	Emergency Response Planning, Trajectory Modeling, Risk & Consequence Assessment
The Perryman Group	USA	500 N. Valley Mills Dr., Suite 300 Waco, TX 76710	(254) 751-9595	Economic and Social Impact Assessment
TMI Solutions	USA	351 Paisano Drive George West, TX 78022	(361) 449-7008	Pipeline route planning (onshore), GIS
SOFEC	USA	15011 Katy Freeway Ste 500 Houston, TX 77094	(713) 510-6600	Offshore floating components (SPM) conceptual information
Imodco Terminals	CH	5 Route de Fribourg CH-1723 Marly Switzerland	+377 9205 1500	Offshore floating components (SPM) conceptual information
Kean Miller LLP	USA	909 Poydras Street Ste 3600 New Orleans, LA 70112	(504) 585-3050	MARAD/USCG, Offshore, Midstream, Application and Permitting, Corporate legal counsel
McElroy, Sullivan, Miller & Weber LLP	USA	1201 Spyglass Drive Ste 200 Austin, TX 78746	(512) 327-8111	EPA legal consultation
Kirkland & Ellis	USA	901 Main Street Dallas, TX 75202	(214) 972-1770	Federal stakeholders and financial consulting
Leotta Location + Design	USA	17170 Perkins Road Baton Rouge, LA 70810	(225) 753-0325	Onshore alternative site analysis
InServ – Integrated Service Company	USA	1312-B Underwood Road LaPort, TX 77571	(832) 460-0953	Detailed design for onshore crude oil storage tanks

33 CFR §148.105(d) Applicant's Citizenship and Operating Authority

An affidavit that the applicant is a citizen of the United States. …For limited liability companies, the equivalent organizational documents, and affidavits from the members of the Board of Managers, and members.

Texas GulfLink, LLC is a limited liability company organized under the laws of the State of Texas. Texas GulfLink, LLC and all of its officers are United States citizens. Individual affidavits attesting thereto are provided in Volume V, Appendix B, Affidavits of US Citizenship [**Confidential**]. Legal documents pertaining to the formation of Texas GulfLink, LLC, including its Certificate of Formation and Corporate Documents are included in Volume V, Appendix C, Corporate Documents [**Confidential**].

33 CFR §148.105(e) Address for Service of Documents

The name and address of one individual who may be served with documents if a formal hearing is held concerning the application, and the name and address of one individual who may receive other documents.

General Contact for Service of Application Documents:

Blair Mathews
Chief Financial Officer
Texas GulfLink, LLC
8333 Douglas Avenue, Suite 400
Dallas, TX 75225
(214) 666-5385
bmathews@sentinelmidstream.com

Additional Contact Information for Application:

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tabadie@sentinelmidstream.com

Tod Everage, Esq.
Kean Miller LLP
909 Poydras Street, Suite 3600
New Orleans, LA 70112
(504) 585-3052
tod.everage@keanmiller.com

33 CFR §148.105(f) Proposed Location and Use of Deepwater Port

The proposed location and capacity of the deepwater port, a general description of the anticipated use of the port, and whether access will be open or closed.

Texas GulfLink is proposing to construct and develop the Texas GulfLink Deepwater Project in the Gulf of Mexico to provide U.S. crude oil loading services on VLCCs and smaller tankers for export to the global market. The project will provide critical infrastructure to clear projected over supplied crude oil volumes from West Texas and the Midcontinent. The Texas GulfLink Deepwater Port would be located in Federal waters in Galveston Area Lease Block GA 423, and GA A 36. The proposed GulfLink Deepwater Port is 28.3nm SE of Freeport, Texas in 104 ft. of water, alongside the existing NW/SE Freeport Safety Fairway by about 3.5 nm. The proposed location and layout of the GulfLink Deepwater Port is designed to minimize the total impacted area. The proximity to the existing Safety Fairway significantly reduces the need for an Approach Safety Fairway to a minimum length.

The Texas GulfLink Deepwater Port will have a proposed Safety Zone encompassing the platforms and SPMs marked with (5), privately maintained navigational buoys. The Safety Zone is 19,853 acres (23.42 nm^2) in size and will be a Federally-regulated zone. The requested ATBAs (33 CFR §150.900) will encompass 500m around each SPM and 534m around the center of the Marine Terminal platform complex. No Tanker will be permitted within the proposed Safety Zone without a Mooring Master onboard and speed is restricted to 6.0 knots. Tankers are required to enter and depart the proposed Safety Zone between buoys “1” and “2”. The Safety Zone will terminate at Buoys “1” and “2” in the SE corner, connecting to a proposed Approach Safety Fairway. The Approach Fairway will run in a W/E direction between latitudes 28°-31.7 N and 28°-29.7 N, be 2.0nm wide, 4.6nm long and intersect the existing NW/SE Safety Fairway. The Vessel Traffic Controller will continuously monitor the Safety Zone by radar and visual observation to detect any vessels not permitted in the Safety Zone and take appropriate action. Nautical Chart 11330 shows the sea bottom in the Deepwater Port area as “MSh” indicating Mud and Shells. A Tanker staging area of 2nm x 4nm is located just south of the entrance to the GulfLink Safety Zone in blocks GA A 52 and GA A 53. Two service mooring buoys will be provided for mooring support boats.

Figure 1. NOAA Chart 11330

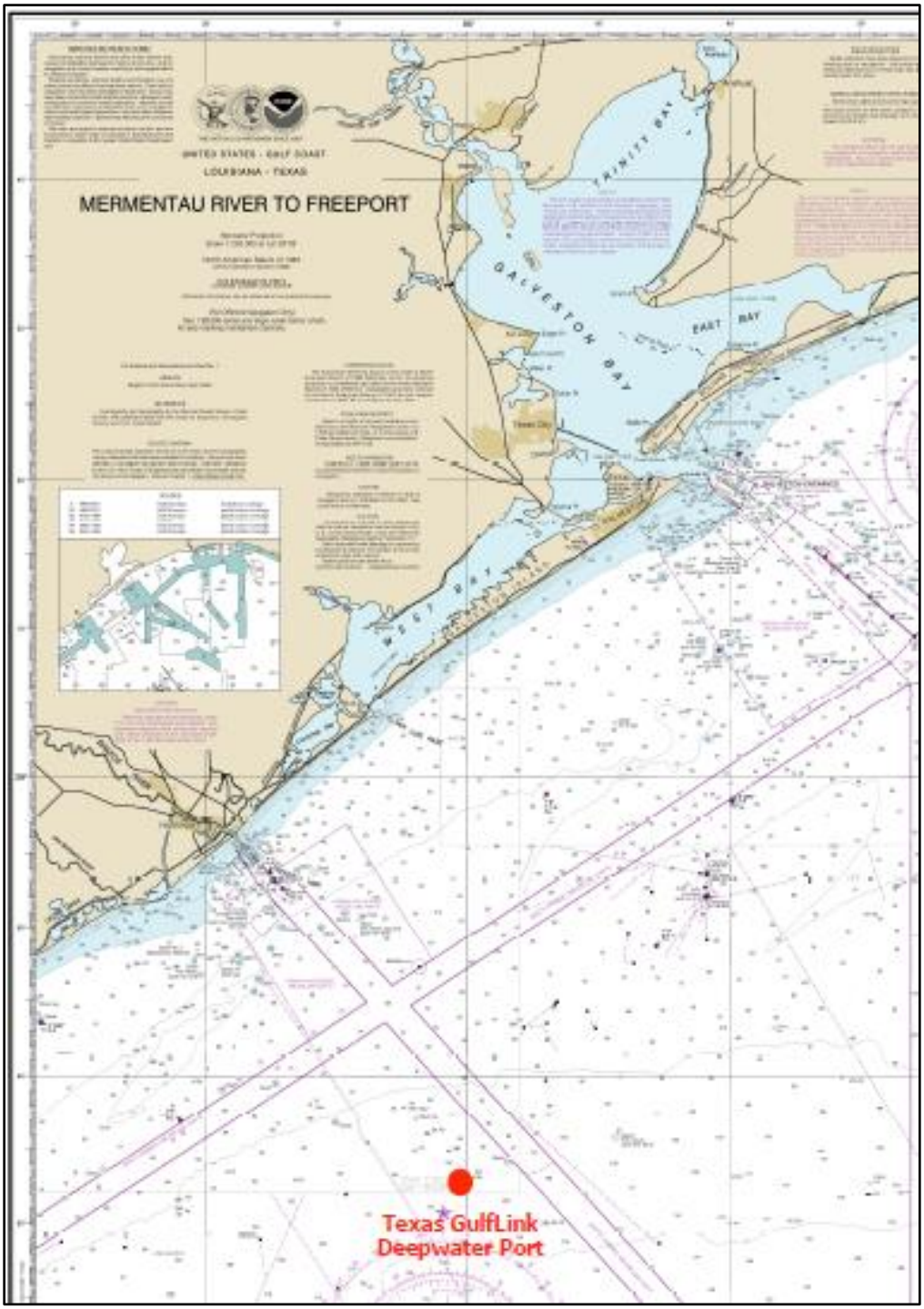


Table 4. Texas GulfLink Location Chart

TBS Ref	Description	Easting	Northing	Latitude-N	Longitude-W	Depth (ft)
	COMPONENTS					
	Platform	3,243,263.2	13,406,478.0	28°-33'08.98"	95°-01'42.35"	104
	SPM 1 (east)	3,250,074.6	13,403,117.8	28°-32'33.43"	95°-00'27.30"	106
	SPM 2 (south)	3,243,263.2	13,398,882.9	28°-31'53.82"	95°-01'45.24"	106
	SAFETY ZONE					
1	SZ NE corner, Buoy 4	3,263,199.0	13,413,433.5	28°-34'11.05"	94°-57'56.23"	104
2	SZ NW corner	3,243,263.2	13,413,433.5	28°-34'17.81"	95°-01'39.70"	103
3	SZ W corner, Buoy 5	3,226,710.9	13,402,800.3	28°-32'38.12"	95°-04'49.24"	104
4	SZ SW corner, Buoy 3	3,238,033.1	13,386,389.2	28°-29'51.95"	95°-02'48.58"	113
5	SZ SE corner, Buoy 1	3,269,275.1	13,386,389.2	28°-29'41.36"	94°-56'58.63"	116
6	SZ N entrance, Buoy 2	3,269,275.1	13,398,541.4	28°-31'41.61"	94°-56'53.91"	111
7	SZ inside corner	3,263,199.0	13,398,541.4	28°-31'43.69"	94°-58'01.99"	111
	SVC BUOYS					
23	Svc Buoy 1	3,252,187.8	13,412,544.4	28°-34'06.00"	95°-00"00.00"	103
24	Svc Buoy 2	3,236,311.5	13,407,153.9	28°-33'18.00"	95°-00'03.00"	103
	ANCHORAGE AREA					
1	NW corner	3,270,878.0	13,382,029.9	28°-28'57.68"	94°-56'42.37"	119
2	NE corner	3,295,182.5	13,382,029.9	28°-28'49.26"	94°-52'10.18"	121
3	SE corner	3,295,182.5	13,369,877.7	28°-26'49.01"	94°-52'14.99	126
4	SW corner	3,270,878.0	13,369,877.7	28°-26'57.43"	94°-56'47.09"	127
	SAFETY APPROACH FAIRWAY					
6	NW corner, Buoy 2	3,269,275.1	13,398,541.4	28°-31'41.61"	94°-56'53.91"	111
5	SW corner, Buoy 1	3,269,275.1	13,386,389.2	28°-29'41.36"	94°-56'58.63"	116
9	SE corner	3,297.026.6	13,386,389.2	28°-29'-31.75"	94°-51'47.80"	119
8	NE corner	3,285,101.7	13,398,541.4	28°-31'36.15"	94°-53'56.59"	113

Description	Lease Blocks
PLATFORM	GA 423
SPM 1	GA 423
SPM 2	GA A 36
SAFETY ZONE	GA A 36, GA A 37, GA 422, GA 423, GA 424, GA 425
APPROACH SAFETY FAIRWAY	GA A 38, GA A 39
ANCHORAGE	GA A 52, GA A 53
PIPELINE (federal blocks)	GA 362, 363, 380, 381, 391, 392, 393, 422, 423, BA 342, 364, GA A 36
PIPELINE (state blocks)	BA 308, 336, 341, 342, 392, 396, 403, 413,

Description of Area	Controlling Depth	Note
Texas GulfLink Safety Zone	104 ft	Svc Buoys delineate 103 depth
Approach Safety Fairway	107 ft	AWOIS dragged to 108 ft
Anchorage Area	118 ft	Outside of Safety Zone

The above Texas GulfLink Location Table (Table 4) represents the proposed location for each offshore component that would be fixed to the seafloor at the TGL Deepwater Port, with a designed life of 30-years. It also includes the proposed Safety Zone, proposed Anchorage, and proposed Safety Approach Fairway locations. The controlling depths within each area are stated with the notation that the Safety Approach Fairway AWOIS location has been dragged to a minimum depth of 108 ft. and that the service buoys will delineate the 104 ft. depth within the Safety Zone. Lease block numbers are provided for reference.

Texas GulfLink will deliver crude oil via a 42" pipeline from its above-ground storage tanks located in Jones Creek, TX. Reference the pipeline location chart provided for location and routing details. An additional 12.45 miles of new-build onshore pipelines, will connect the onshore crude oil storage facility and pumping station (Jones Creek Terminal) to the offshore Texas GulfLink Deepwater Port pipeline. The departing crude oil will be metered as it leaves the onshore terminal tank and again at the offshore platform, providing custody transfer and line surveillance. A new platform complex, consisting of (2) four pile platforms connected by a 125 ft Bridgeway, in 104 ft. water depth, will be constructed. One platform will be the Control Platform (75 ft x 75 ft), with personnel living quarters, helideck and a vessel traffic controller control room, utilizing a state-of-the-art radar system to monitor the port on a 24-hour basis. The other platform, the Metering Platform (80 ft x 100 ft), will contain: generators, pig receivers, lease automatic custody transfer (LACT) unit, oil displacement prover loop, sampling pot, radar tower, electrical and instrumentation building, portal cranes, and a crane. The platforms will have three levels with the upper level 109 ft. ELEV, the mid at 84 ft., and the lower level at 69 ft. There will be two (2) 42" OD Lateral pipelines approximately 1.25 nm complete with PLEMS. Two (2) CALM style SPM Systems provided at the end of each lateral pipeline in approximately 106' water depth, one in block GA 423 and the other in block GA A36. The CALM Buoy System includes a body with turntable and product swivel to transfer up to 85,000 bph. The CALM Buoy system shall be designed to provide a safe mooring for the tankers within the sea states specified in a Metocean analysis report and in accordance with Class Society and OCIMF Guidelines. Texas GulfLink's guidelines will allow a VLCCs to moor at the SPM in seas up to 9 ft and winds to 30 knots. Two hawsers will be provided with 76mm chains to connect to the Tanker's chain stoppers in accordance with OCIMF recommendations.

The port will utilize two (2) SPMs, each having: two (2) 24-inch inside diameter crude oil subsea hoses interconnecting with the PLEM; two (2) 24inch inside diameter floating, double carcass, crude oil hoses connecting the Tanker to the SPM buoy. The subsea hoses would be approximately 160 ft. in length and rated for 275 pounds per square inch gauge (18.9 bar). The floating hoses will be approximately 1100 ft. in length and rated for 275 psig (18.9 bar). Each floating hose will contain an additional 100 ft of 16-inch "rail tail hose" that is designed to be lifted and robust enough for hanging over the edge railing of the Tanker. Marine breakaway couplings will be provided to protect the hose string and limit the impact of a spill from a separated hose string.

The SPM's will be located 1.25nm from the Platform Complex with a maneuvering area around the SPM's of 0.6nm. The 1.25nm spacing significantly reduces the risk of platform damage resulting from an emergency event, such as engine/equipment failure while maneuvering or a breakaway from the moorings, allowing enough distance to take corrective action and prevent the tanker from hitting the platform. The 0.6nm SPM maneuvering area for mooring and unmooring operations will allow for a minimum distance off the platform of 0.65nm at all times.

The port will primarily load VLCC-class Tankers from the worldwide fleet taking about 39 hours in the proposed Texas GulfLink Safety Zone for each full load. Tankers will approach the Texas GulfLink Safety Zone from the Approach Safety Fairway, after exiting the existing Freeport Safety Fairway, picking up a

Mooring Master outside of buoys 1 and 2. An escort tug will be tethered to the Tanker's stern and the Mooring Master will advise the Master on navigation and mooring procedures. Two Tankers may be moored at any given time, one loading, and the other standing by. Dual loading operations will not be conducted. The port will operate on a 24-hour basis.

A Shoreside Support Facility & Warehouse Facility will be established within Port Freeport harbor. The facility will support operations at the Marine Terminal and include berths for the support boats and a warehouse storage area.

The port will primarily load VLCC class Tankers from the worldwide fleet taking about 39 hours in the proposed Texas GulfLink Safety Zone for each full load. Tankers will approach the Texas GulfLink Safety Zone from the Approach Safety Fairway, after exiting the existing Freeport Safety Fairway, picking up a Mooring Master outside of buoys 1 and 2. An escort tug will be tethered to the Tanker's stern and the Mooring Master will advise the Master on navigation and mooring procedures. Two Tankers may be moored at any given time, one loading, and the other standing by. Dual loading operations will not be conducted. The port will operate on a 24-hour basis.

33 CFR §150.380 Regulated Activities of Vessels at Deepwater Ports (SAFETY ZONE) - **NOT PERMITTED**

- Transit by vessels other than tankers
- Anchoring
- Fishing, including bottom trawl (shrimping)
- Drilling Operations
- Lightering

Figure 2. Terminal Project Location

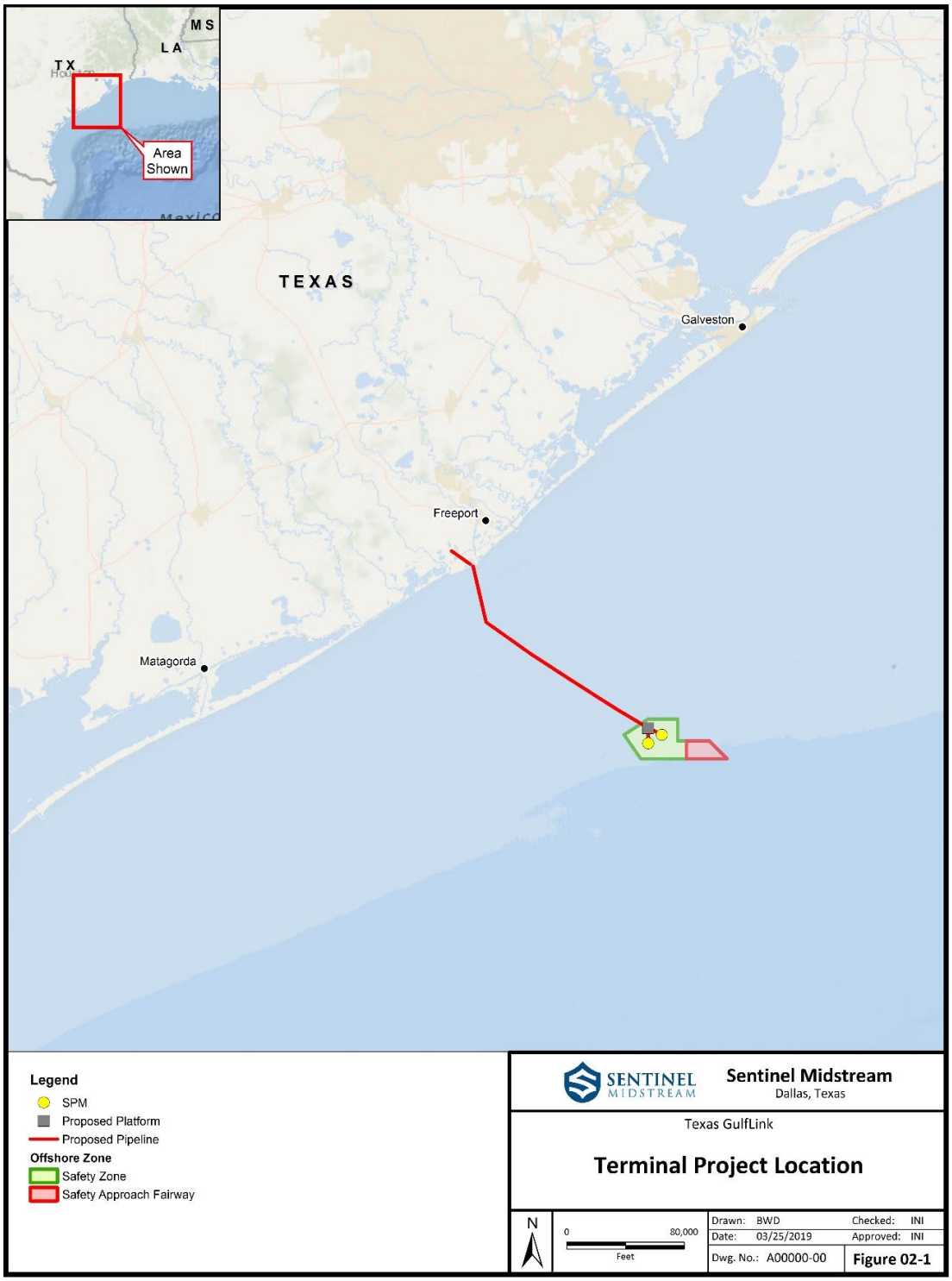
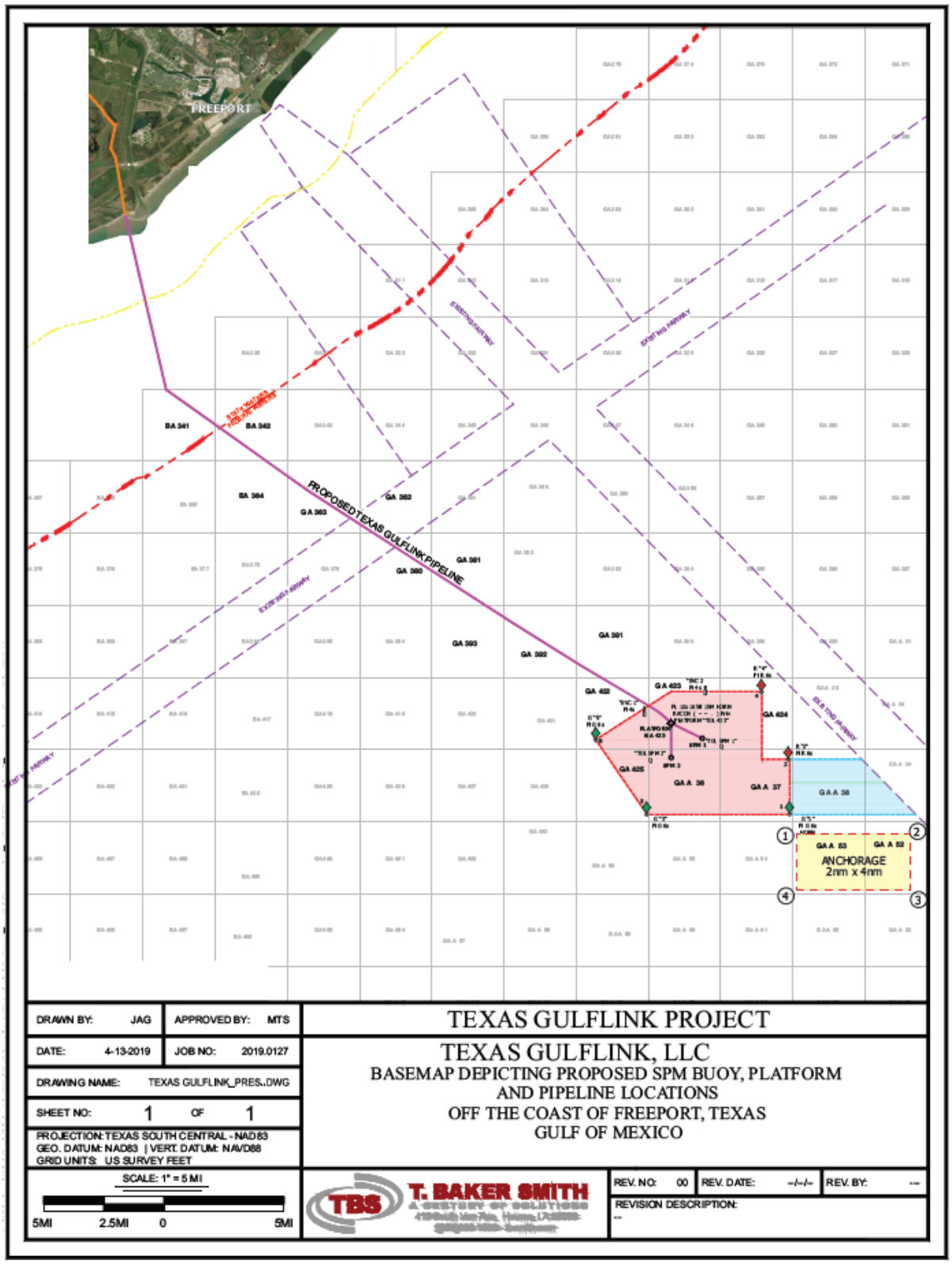


Figure 3. Proposed Pipeline Route and Lease Block Numbers



33 CFR §148.105(g) Financial Information

§148.105(g)(1) Applicant and Affiliates' Financial Information

(1) For the applicant, each affiliate with an ownership interest in the applicant of greater than 3 percent, and affiliates which have a direct contractual relationship with the deepwater port:

> ***(i) Annual financial statements, audited by an independent certified public accountant, for the previous 3 years, including, but not limited to, an income statement, balance sheet, and cash flow statement with footnote disclosures prepared according to U.S. Generally Accepted Accounting Principles; provided, however, that the Commandant (CG-5), in concurrence with MARAD, may waive this requirement upon finding:***
>
> ***(A) That the affiliate does not, in the normal course of business, produce audited statements; and***
>
> ***(B) That the affiliate is part of a larger corporate group whose audited statement provides sufficient information to support an adequate assessment of the affiliate's relationship with and impact on the applicant.***

Texas GulfLink, LLC was created in 2019, for the purpose of developing, licensing, owning, constructing, and operating a deepwater crude oil export terminal to service the energy export market. As such, Texas GulfLink does not have audited annual financials at this time. Texas GulfLink is a wholly-owned subsidiary of Sentinel Midstream, LLC. The identities and relationship of the Texas GulfLink and Sentinel Midstream entities are set forth in Section 148.105(a)(1) above, and are part of a larger corporate group owned by Cresta Energy Fund I, LP and Cresta Energy Fund I Carry, LP. Audited annual and unaudited quarterly financial statements are provided in Volume V, Appendix D, Financial Statements [**Confidential**].

§148.105(g)(2) Construction Cost Estimates

An estimate of construction costs, including: A phase-by-phase breakdown of costs. The estimated completion dates for each phase; A preliminary estimate of the cost of removing all of the deepwater port marine components, including pipelines that lie beneath the seabed. The operator of a deepwater port is responsible for the costs associated with removal of all port components. Should a license be granted, MARAD will require a bond, guarantee, or other financial instrument to cover the complete cost of decommissioning as a condition of the license.

An estimate of the construction costs and estimated completion dates for the Texas GulfLink Deepwater Port Project are provided in Volume V, Appendix E, Proposed Construction Schedule [**Confidential**]; Volume V, Appendix F, Estimated Construction Costs [**Confidential**]; Volume V, Appendix G, Estimated Decommissioning Costs [**Confidential**].

§148.105(g)(3) Annualized Projections

(i) Annualized projections or estimates, along with the underlying assumptions, for the next 5 years and at reasonable intervals throughout the life of the deepwater port, of each of the following:

Total oil or natural gas throughput, and subtotals showing throughput owned by the applicant and its affiliates and throughput owned by others;

(ii) Projected financial statements, including a balance sheet and income statement; and

(iii) Annual operating expenses, showing separately any payment made to an affiliate for any management duties carried out in connection with the operation of the deepwater port.

Neither Texas GulfLink, nor any of its affiliates, will own any of the oil transported and exported through the Deepwater Port. Texas GulfLink will only provide infrastructure for shippers to move their oil to the export market. The annualized throughputs (owned by others), financial projections, and operating expense projections of Texas GulfLink are provided in Volume V, Appendix H, Annualized Oil Throughput Projections [**Confidential**]; Volume V, Appendix I, Annualized Financial Projections [**Confidential**]; and Volume V, Appendix J, Annualized Operating Expense Projections [**Confidential**].

§148.105(g)(4) Proposals and Agreements

A copy of all proposals or agreements concerning the management and financing of the deepwater port, including agreements relating to throughputs, capital contributions, loans, guarantees, commitments, charters, and leases.

A copy of the proposals and agreements concerning the management and financing Texas GulfLink, if any, including agreements related to throughputs, capital contributions, and other commitments are provided in Volume V, Appendix K, Proposals and Agreements [**Confidential**]; Volume V, Appendix L, Throughput Commitments [**Confidential**]. At the time of filing, Texas GulfLink is actively negotiating proposals and commitments from additional customers. Texas GulfLink will advise MARAD and USCG as those negotiations become formalized into commitments or agreements.

§148.105(g)(5) Throughput Reports

The throughput reports for the calendar year preceding the date of the application, for the applicant and each of the applicant's affiliates engaged in producing, refining, or marketing oil or natural gas and natural gas liquids, along with a copy of each existing or proposed throughput agreement. Each throughput report must list the throughput of the following products:

Crude oil; and if crude oil is the only product the port is designed to transport, the throughput report may be limited to reporting crude oil; etc.

As Texas GulfLink is a proposed new facility and is not yet in operation, there are no throughput reports for the year preceding the application for the DWP license. However, members from the Texas GulfLink team were directly responsible for the scheduling, managing, and operations of more than one million barrels per day of incoming receipts into various facilities, and more than one million barrels per day in deliveries to connecting pipelines. More information concerning the projected annualized throughputs at Texas GulfLink is provided in Volume V, Appendix H, Annualized Oil Throughput Projections [**Confidential**].

33 CFR §148.105(h) Construction Contracts and Studies

§148.105(h)(1) Initial Items

A copy of each contract that the applicant made for the construction of any component of the deepwater port or for the operation of the port.

Texas GulfLink has not, at the time of submitting this DPLA, entered into any contract for the construction of the Texas GulfLink Deepwater Port. When such contracts are executed, Texas GulfLink will forward copies to the USCG and MARAD.

§148.105(h)(2) Studies

A listing and abstract of: All completed or ongoing studies on deepwater ports conducted by or for the applicant; and all other construction-related studies used by the applicant.

The following construction and environmental studies have been performed by various contractors on behalf of the Texas GulfLink project. Copies of these studies are provided in the various Appendices and Volumes as specifically reflected below:

1. Raw Weather Data: Volume II, Appendix A
2. Offshore Archeological Report: Volume II, Appendix E
3. ABS Rules for Building and Classing Single Point Moorings, January 2019: Volume II, Appendix F
4. The Economic Benefits of the Texas GulfLink Project: Volume II, Appendix G
5. Safety Data Sheet for Delaware Basin, Texas Crude Oil: Volume II, Appendix H
6. Texas GulfLink Consolidated Trajectories: Volume II, Appendix I
7. Oil Spill Modeling Report: Volume II, Appendix J
8. TGLP Oil Spill Consequence Report for Inland Worst-Case Discharges: Volume II, Appendix K
9. TGLP Oil Spill Consequence Report for Offshore Worst-Case Discharges: Volume II, Appendix L
10. CK Texas GulfLink Environmental Baseline Survey: Acoustic Monitoring, Offshore Texas, Volume III, Appendix E
11. Texas GulfLink Export Facility Environmental Baseline Survey, Freeport, TX, Volume III, Appendix F
12. ISFWS IPaC Resource Lists, Volume III, Appendix G
13. Risk and Consequence Assessment, Volume III, Appendix H
14. TPWD Annotated County Lists of Rare Species, Brazoria County, Volume III, Appendix I
15. Element Occurrence Record, Piping Plover, Volume III, Appendix J
16. Draft Application for Incidental Harassment Authorization for the Non-Lethal Taking of Marine Mammals, Volume III, Appendix K
17. Onshore Cultural Resources Desktop Assessment, Volume III, Appendix L
18. Texas GulfLink Terminal Project Wetland Data Report, Volume III, Appendix M
19. Application for a Permit to Discharge Hydrostatic Test Water, Volume III, Appendix N
20. Offshore Reconnaissance Survey: Volume III, Appendix R, Offshore Survey Report
21. Offshore Hazard Survey: Volume III, Appendix R, Offshore Survey Report
22. Offshore Proposed Pipeline Route, Platform, and SPM Buoy Location: Volume III, Appendix R, Offshore Survey Report
23. Offshore Cultural Resources Report: Volume III, Appendix S
24. Offshore Soil Data: Volume IV, Appendix B [**Confidential**]
25. Offshore Platform Structural Analysis: Volume IV Appendix G [**Confidential**]

26. Preliminary Hydraulics, Surge, and Overpressure Protection (Relief) Analysis: Volume IV, Appendix H [**Confidential**]

§148.105(h)(3) Contractor Identities

The identity of each contractor, if known, that will construct or install the deepwater port or a portion of the port, including each firm's name, address, citizenship, telephone number, and qualifications.

Each offshore component contractor currently working on the Texas GulfLink Project is identified in "§148.105(c) Engineering Firms", above. Additional information about the qualifications of those contractors is provided in Volume IV, Appendix A, Engineering Qualifications [**Confidential**]. At this time, neither Texas GulfLink, nor any of its affiliates, have entered any contracts related to the construction of the deepwater port. At such time when contracts are executed, Texas GulfLink will promptly notify MARAD and the U.S. Coast Guard, and provide information required under §148.105(h)(2).

33 CFR §148.105(i) Compliance with Federal Water Pollution Requirements

Compliance with Federal water pollution requirements. Evidence, to the extent available, that the requirements of section 401(a)(1) of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1341(a)(1), will be satisfied. If complete information is not available by the time MARAD must either approve or deny the application under 33 U.S.C. 1504(i)(1), the license for the deepwater port is conditioned upon the applicant demonstrating that the requirements of section 401(a)(1) of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1341(a)(1), will be satisfied.

The construction and operation of the Texas GulfLink Project will involve activities that require permits to insure compliance with Federal water pollution requirements and regulations. Texas GulfLink has identified the following Federal and State statutes and regulatory agencies governing its activities and project, and below describes how it will comply with those applicable requirements.

Clean Water Act §401 | Water Quality Certification in Texas

The Federal Water Pollution Control Act Amendments of 1972, (the "Clean Water Act" (CWA)), regulates water quality standards for surface waters, and regulates discharges into the waters of the United States. Section 401(a)(1) of the CWA requires any applicant for a Federal license or permit to provide the licensing or permitting agency a certification that any resultant discharges will comply with the applicable provisions of Sections 301, 302, 303, 306, and 307 of the CWA. The certification must come from the state in which the discharge originates or will originate, or in certain instances the interstate water pollution control agency with jurisdiction over navigable waters.

In Texas, the Railroad Commission of Texas (RRC) has sole authority for the prevention and abatement of pollution of surface waters associated with oil and gas exploration, development, and production operations, including pipeline transportation of crude oil and natural gas (Texas Natural Resource Code '91.101 and Texas Water Code §26.131). The Texas Commission on Environmental Quality (TCEQ) is the state agency that sets and implements standards for surface water quality to improve and maintain the quality of water in Texas. The 2018 Texas Surface Water Quality Standards were adopted by TCEQ on February 7, 2018 and became effective on March 1, 2018 for all state permits, including those issued by the RRC (Texas Admin. Code Tile 30, Chapter 307). The 2018 Texas Surface Water Quality Standards are currently under review by the United States Environmental Protection Agency as required by CWA §303(c). The EPA has only approved a portion of the 2018 Texas Surface Water Quality Standards. Portions of the 2018 Texas Surface Water Quality Standards that have been disapproved or are still under review by the EPA will revert to the language in the prior revision year for CWA purposes.

Section 26.131 of the Texas Water Code requires the issuance of a Water Quality Certificate for all projects in connection with construction, operation, or maintenance of a crude oil pipeline facility. The Texas GulfLink Project consists of such activities, and therefore, is subject to RRC review for compliance with the applicable Texas Surface Water Quality Standards. The RRC will issue the §401 Water Quality Certification which is typically done at the request of the United States Army Corps of Engineers concurrent with the Section 404 CWA and/or Section 10 Rivers and Harbors Act permit review (TAC Title 16, Part 1, Chapter 3, Rule §3.93).

Clean Water Act § 402 | National Pollution Discharge Elimination System (NPDES)

Section 402 of the Clean Water Act (CWA) requires all construction sites on an acre or greater of land, as well as municipal, industrial, and commercial facilities discharging wastewater or stormwater to waters of the U.S. require to obtain authorization to discharge storm water and wastewaters through the

National Pollutant Discharge Elimination System (NPDES) permitting system. The State of Texas has a unique permitting environment in that three separate entities, including the United States Environmental Protection Agency (USEPA), the Texas RRC, and the TCEQ have jurisdiction over water discharge permitting activities.

The TCEQ has been delegated authority to administer the NPDES system within the State of Texas. The TRRC has been granted jurisdiction over oil transportation and storage within the State of Texas. However, the Texas RRC has not been delegated authority to issue NPDES permits for these type facilities. Therefore, the USEPA will be the permitting authority who issues and administers NPDES permits for the facility, including construction general permits and operational permits for the onshore portions of the Texas GulfLink Deepwater Port Project.

Offshore discharges, including hydrostatic discharges and stormwater or wastewater discharges, that would occur at the Texas GulfLink Deepwater Port Facility would be covered under a separate individual permit also issued by the USEPA. The USEPA has NPDES permitting jurisdiction for the offshore portion because the proposed discharges will occur outside of the territorial waters of the State of Texas (greater than 9 nautical miles), but within federal waters (less than 200 nautical miles).

Volume III, Section 11 of this Deepwater Port license application provides more detail on the NPDES permit applications developed for the Texas GulfLink Project.

Clean Water Act § 404 | Permitting Discharges of Dredge and Fill Material

Section 404 of the CWA regulates the discharge of dredged and fill material from a project's construction into the waters of the United States, including wetlands (33 Code of Federal Regulations [CFR] 323). In Texas, the U.S. Army Corps of Engineers (USACE) Districts regulate activities in jurisdictional waterbodies and wetlands under Section 404 of the CWA. Texas GulfLink's proposed site is located within the jurisdiction of the Galveston District of the U.S. Army Corps and is also within the Texas Coastal Zone, requiring a Coastal Zone Consistency Determination from the Texas General Land Office (GLO) – Coastal Management Program. Texas GulfLink has met with the USACE, Galveston District and the Texas GLO to discuss the permitting requirements for the Project. A copy of the draft permit application that will be submitted to the USACE Galveston District and Texas GLO requesting authorization under Section 404 of the CWA, Section 10 of the Rivers and Harbors Act and a Coastal Zone Consistency Determination is provided in Volume III, Appendix A, Section 404/10, Permit Application.

Rivers and Harbors Act § 10 | Construction in Navigable Waters

Section 10 of the Rivers and Harbors Appropriation Act of 1899 regulates navigable state and Federal waters, and a permit is required for any constructed structure from the USACE (33 U.S.C. § 403). Section 4(e) of the Outer Continental Shelf Lands Act (OCSLA) (Title 43, Chapter 29, Subchapter III) grants the USACE the authority to regulate activities that would disturb the seafloor and potentially affect navigation to the seaward limit of the OCS. In Texas, activities that would affect navigable waters, in the coastal management zone and/or OCS, require submittal of permit application materials to the USACE and the Texas GLO – Coastal Management Program. Texas GulfLink has met with the USACE Galveston District and the Texas GLO to discuss the permitting requirements for the Project. A copy of the draft permit application that will be submitted to the USACE Galveston District and Texas GLO requesting authorization under Section 404 of the CWA, Section 10 of the Rivers and Harbors Act and a Coastal Zone Consistency Determination is provided in Volume III, Appendix A, Section 404/10, Permit Application.

Marine Protection, Research, and Sanctuaries Act § 403

The Marine Protection, Research, and Sanctuaries Act (16 U.S.C § 1431 *et seq.* and 33 U.S.C. § 1401, *et seq.*), also referred to as the Ocean Dumping Act, prohibits dumping into the ocean material that would unreasonably degrade or endanger human health or the marine environment. If ocean dumping is proposed, a permit must be obtained from the USACE after they have evaluated the activities using the EPA's environmental criteria. The USACE permit is subject to EPA concurrence. Currently, the Texas GulfLink Project does not anticipate or propose any ocean dumping. Should the need for ocean dumping arise, Texas GulfLink would consult with the USACE and EPA to obtain necessary permits and/or approvals prior to undertaking any ocean dumping activities.

Coastal Zone Management Act | 16 U.S.C. §1451 *et seq*.

The Federal Coastal Zone Management Act (CZMA) of 1972 (16 U.S.C. § 1451 *et seq*.) grants the states authority to determine if activities proposed by government or private entities are consistent with the coastal management program adopted by the states. The CZMA is administered by the National Oceanic and Atmospheric Administration (NOAA) and its purpose is to preserve, protect, develop, and where possible, to restore or enhance the resources of the nation's coastal zone. In Texas, the NOAA-funded Texas Coastal Management Program (TCMP) is managed by the Texas GLO. In this case, Section 307 of the CZMA requires Federal consistency with the TCMP. Texas GulfLink will be required to submit a Coastal Management Program Consistency Statement for review by the Texas GLO along with the required USACE documents. Texas GulfLink has met with the USACE, Galveston District and the Texas GLO to discuss the permitting requirements for the Project. A copy of the draft permit application that will be submitted to the USACE Galveston District and Texas GLO requesting authorization under Section 404 of the CWA, Section 10 of the Rivers and Harbors Act, and a Coastal Zone Consistency Determination is provided in in Volume III, Appendix A, Section 404/10, Permit Application.

The onshore storage/supply components are within the designated coastal zone, which is managed by the Texas RRC through the TCMP. An application and request for consistency review to the RRC would be submitted for development within the coastal zone.

33 CFR §148.105(j) Coastal Zone Management

A request for each certification required by section 307 of the Coastal Zone Management Act of 1972, 16 U.S.C. §1456, as amended.

The Coastal Zone Management Act (CZMA) of 1972 (16 U.S.C. §1451, *et seq*.) grants states authority to determine if activities by government and private entities maintain consistency with the coastal management program that is adopted by states. States that choose to adopt the program become eligible for federal funding assistance and gain consistency determination authority over any activity that could affect their coastal zones. Consistency determinations are required for activities that are federally funded, licensed and/or permitted, including offshore infrastructure in U.S. navigable waters, including waters in the Exclusive Economic Zone (EEZ) that may impact coastal waters. As a condition of the DWP license application, a project must meet determination consistency with the coastal management program. The Texas GLO, as part of the state adopted Texas Coastal Management Program (TCMP), issues consistency determinations required under the Coastal Coordination Act (CCA).

The onshore storage and supply components are located entirely within the Texas coastal zone boundary of Brazoria County, which is managed by the TCMP as administered by the Texas Coastal Coordination Advisory Committee and the Texas GLO. A request for consistency review by the Texas GLO would be initiated by the USACE as part of Texas GulfLink Section 404/10 application to the USACE for a permit to construct and operate the DWP and on-shore facilities. The project must file a copy of determination of consistency with the TCMP issued by the Texas GLO before proceeding with construction. A copy of the draft Section 404 permit application can be found in Volume III, Appendix A, Section 404/10, Permit Application.

33 CFR §148.105(k) Lease Block Information

§148.105(k)(1) Lease Block(s) where Proposed Deepwater Port or its Approaches are Located

Identification of each lease block where any part of the proposed deepwater port or its approaches is located. This identification must be made on Official Outer Continental Shelf leasing maps or protraction diagrams, where available. Each map and diagram must be certified by a professional surveyor. For each lease block, provide the following: A description of each pipeline, or other right-of-way crossing, in enough detail to allow plotting of the rights-of-way to the nearest one-tenth of a second in latitude and longitude; The identity of the lessee or grantee of each pipeline or other right-of-way.

The survey corridor traverses several offshore lease blocks, within the State of Texas, Brazos and Galveston Planning Areas (Table 4 above), only one of these are currently active. The State Lease Block 336 has an active lease by the Texas Parks & Wildlife for a Liberty Ship Reef, through 2028, located about 1 ¼ miles East of the proposed pipeline. Permission to lay the pipeline will be obtained prior to construction. Most of these blocks are administered by the State of Texas, but jurisdiction transfers to the Bureau of Ocean Energy Management (BOEM) along the Three Marine League Line. The lease blocks landward of this line were delineated by the Texas Land Survey (TLS), and the Outer Continental Shelf (OCS) blocks to the East were delineated by the National OCS Oil and Gas Leasing Program.

Preliminary turbidity considerations during proposed offshore pipeline construction are not expected to impact the Liberty Ship Reef. Formal turbidity modeling will be performed during soil boring investigations.

Figure 3. Proposed Pipeline Route and Lease Block Numbers

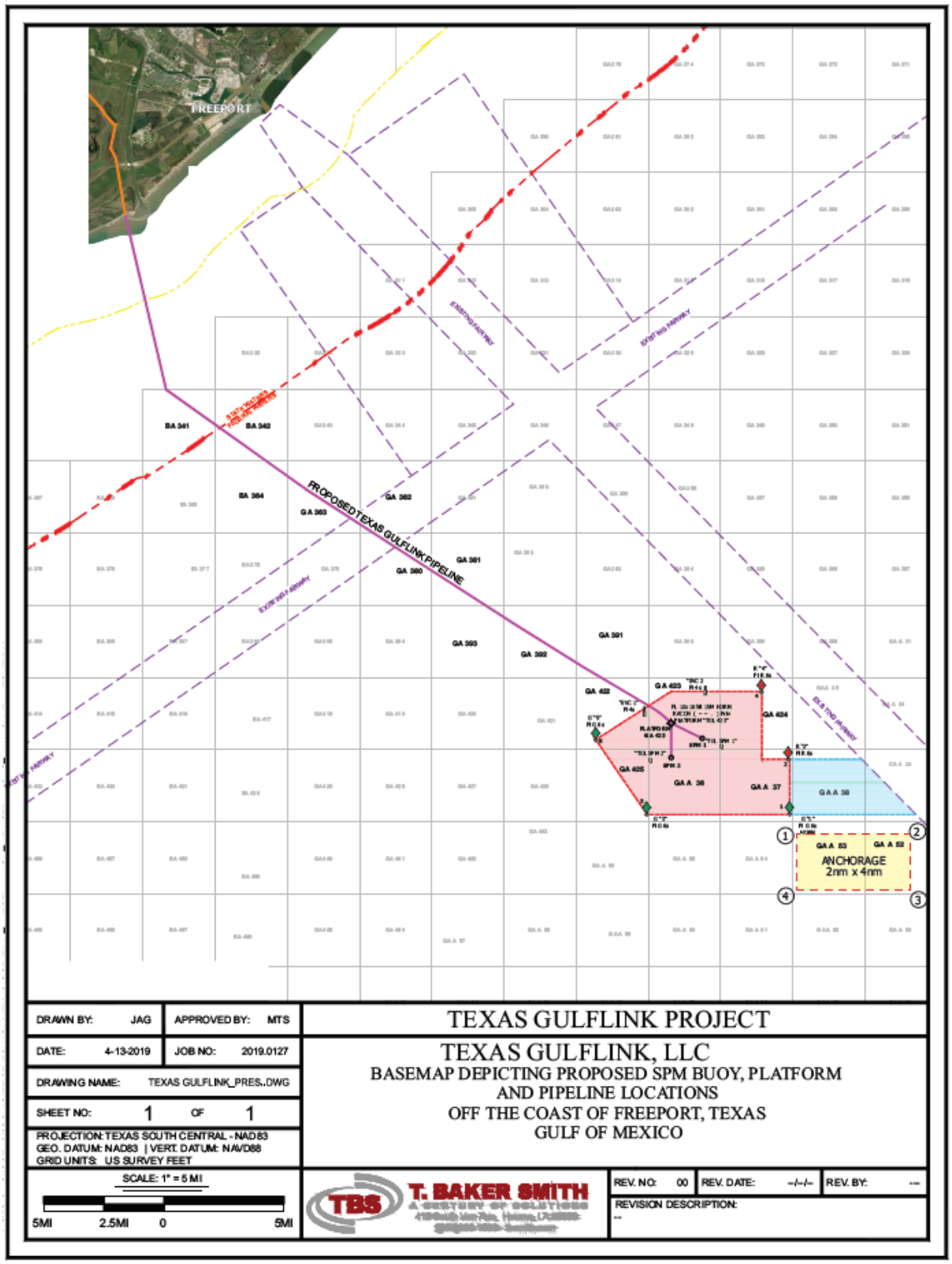
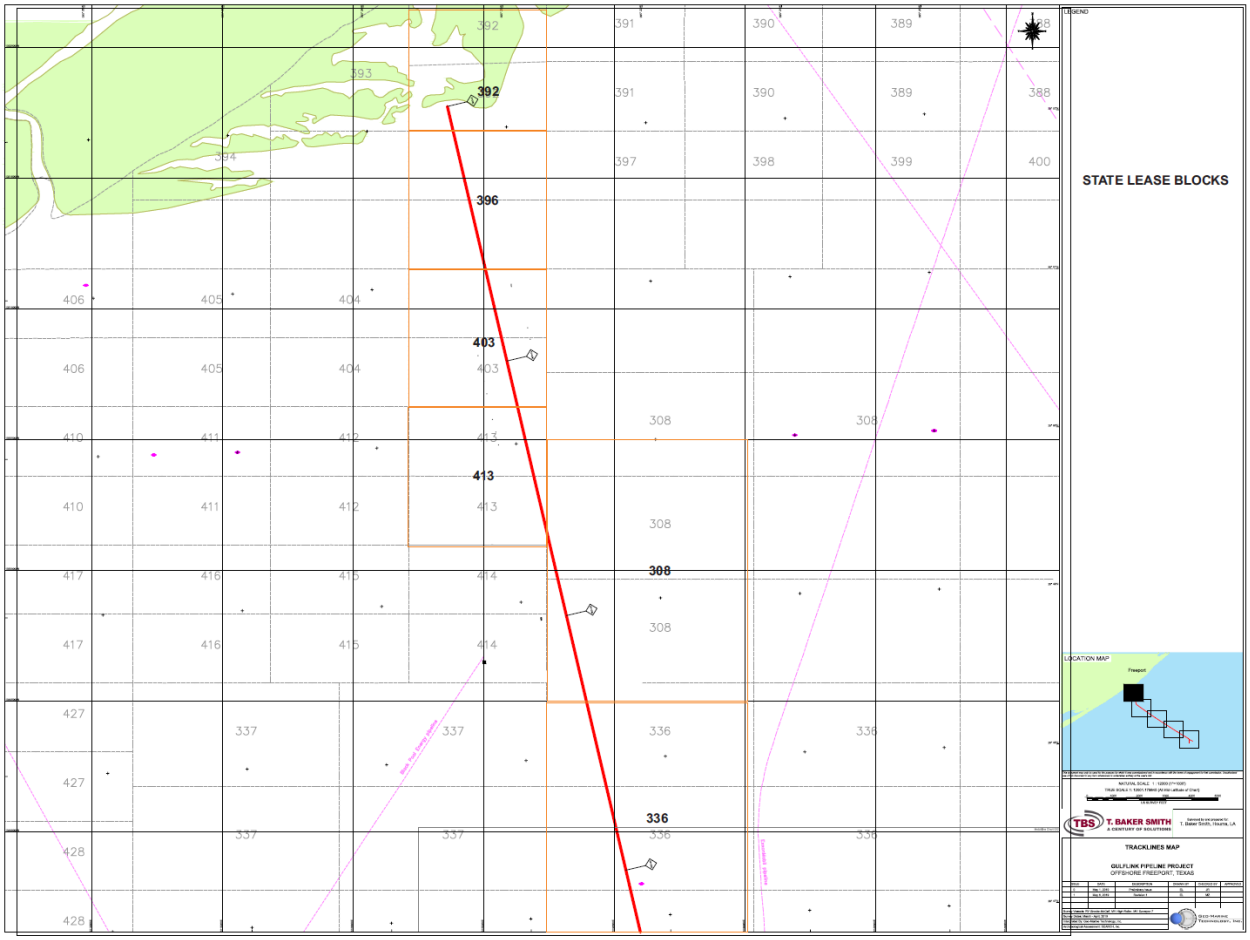


Figure 4. State Lease Blocks



Texas GulfLink's offshore Deepwater Port components will traverse several offshore lease blocks, all within the Brazos and Galveston Planning Areas (See Volume III, Appendix R, Offshore Survey Report).

Table 5. Texas GulfLink Pipeline and Cable Crossing Lease Blocks

Pipeline/Cable Owner	Lease Block
Back Pool Pipeline (Possible)	N/A near shore
ExxonMobil Pipeline	BA-341
American Midstream Pipeline	BA-341
Mariner Energy Pipeline	BA-364
BP GoM Exploration Cable	GA-393
Petrocom Cable	GA-393
Transcontinental Pipeline	GA-392

See Volume III, Appendix R, Offshore Survey Report for more information on the pipeline and cable crossings.

§148.105(k)(2) Interest in Lease Block(s)

Detailed information concerning any interest that anyone, including the applicant, has in each block.

The survey corridor traverses several offshore lease blocks, within the State of Texas, Brazos and Galveston Planning Areas, only one of these are currently leased. The State Lease Block 336 has an active lease by the Texas Parks & Wildlife for a Liberty Ship Reef, through 2028, located about 1 ¼ miles east of the proposed pipeline. Permission to lay the pipeline will be obtained prior to construction. Most of these blocks are administered by the State of Texas, but jurisdiction transfers to the Bureau of Ocean Energy Management (BOEM) along the Three Marine League Line. The lease blocks landward of this line were delineated by the Texas Land Survey (TLS), and the Outer Continental Shelf (OCS) blocks to the east were delineated by the National OCS Oil and Gas Leasing Program.

Detailed information concerning the present and planned use of each block.

The following Table lists detailed information on the present and planned use of each lease block.

Table 6. Lease Block Information

Number	AREA	Block Number	Lease Status	Effective Date	Expiration Date	Depth (m)	Location
03-003252		308	Not active				Pipeline
03-003500		336	TP&WD		2028		Pipeline
03-015917		403	Not active				Pipeline
03-016015		413	Not active				Pipeline
03-016024		414	Not active				Pipeline
03-015800		392	Not active				Pipeline
03-015846		396	Not active				Pipeline
G13296	BA	341	EXPIRED	10/1/1991	9/30/1996	19	Pipeline
G31011	BA	342	RELINQUISH	10/1/2007	8/9/2011	21	Pipeline
G14841	GA	362	TERMINATED	10/1/1994	4/12/2004	25	Pipeline
G06113	GA	363	TERMINATED	10/1/1983	9/12/2006	24	Pipeline
G26457	BA	364	RELINQ	12/1/2004	3/27/2008	23	Pipeline
G24370	GA	380	RELINQUISH	10/1/2002	9/29/2005	27	Pipeline
G23184	GA	381	EXPIR	10/1/2001	9/30/2006	28	Pipeline
G32741	GA	391	RELINQ	11/1/2008	10/22/2010	30	Pipeline
G32742	GA	392	EXPIRED	11/1/2008	10/31/2013	30	Pipeline
G26481	GA	393	EXPIRED	12/1/2004	11/30/2009	30	Pipeline
G09014	BA	413	RELINQUISH	12/1/1987	8/26/1998	24	Pipeline
G15763	GA	422	EXPIRED	2/1/1996	1/31/2001	32	Pipeline
G22218	GA	423	EXPIRED	10/1/2000	9/30/2005	32	SPM 1 /Platform / SZ
G22219	GA	424	TERMINATED	10/1/2000	2/15/2016	33	SZ
	GA	425	inactive				SZ
G11326	GA A	A 36	RELINQUISH	10/1/1989	9/23/1992	35	SPM 2 / SZ
G22220	GA A	A 37	EXPIRED	10/1/2000	9/30/2005	35	SZ
G24375	GA A	A 38	RELINQUISH	10/1/2002	9/29/2005	36	Approach Fairway
00737	GA A	A 39	RELINQUISH	5/1/1960	4/27/1961	36	Approach Fairway
00739	GA A	A 52	RELINQUISH	5/1/1960	4/27/1961	51	Anchorage
	GA A	A 53	inactive				Anchorage

33 CFR §148.105(l) Overall Site Plan

Single-line drawings showing the location and type of each component of the proposed deepwater port and its necessary facilities, including:

Fixed and floating structures and associated components seaward of the high-water mark, located at the interface of Brazoria County and Texas state waters in the Gulf of Mexico. The offshore components consist of approximately 28.3 nautical miles of 42-inch OD crude oil pipeline connecting to a riser at the new platform which then connects to two (2) SPM Buoy Systems connected by separate, 1.25 nm in length, 42-inch lateral pipelines.

§148.105(l)(1) Floating Structures

SPM Buoy System No. 1 is located at Latitude N28°32'33.43" and Longitude W95°00'27.30" and the SPM Buoy System No 2 is located at Latitude N28°31'53.82" and Longitude W95°01'45.24". Each SPM Buoy System consists of a PLEM, CALM system, mooring hawsers, two (2) 24-inch under-buoy marine hoses, and two (2) 24-inch floating marine hoses for the transfer of crude oil from the SPM Buoy System to the vessels moored at the SPM.

For single line drawings, see Volume II, Appendix B, Site Plan Drawings and Figure 4 Texas GulfLink Marine Terminal Location Map below. For additional information see Tables found in §148.105(l)(3) Aids to Navigation and Volume IV, Appendix E, Vendor Examples of SPM Design [**Confidential**].

§148.105(l)(2) Fixed Structures

The TGL fixed structures consist of two (2) platforms; one platform will contain living quarters, radar control, and utilities and the other platform will contain metering, surge system, valve manifold, and power generation. The proposed platforms will be connected by a 125 ft. bridgeway. The proposed platforms are located at Latitude N28°33'08.98" and Longitude W95°01'42.35".

For additional information, see Volume II, Appendix B, Site Plan Drawings, and Figure 4. Texas GulfLink Marine Terminal Location Map. For more information on fixed structures, see 33 CFR §148.105(r) Fixed Offshore Components. See Volume IV, Appendix F, Galveston Block Area Texas GulfLink Design Basis – (2) 4-Pile [**Confidential**]. See Table 7 below for the proposed offshore equipment list.

Figure 5. Texas GulfLink Marine Terminal Location Map

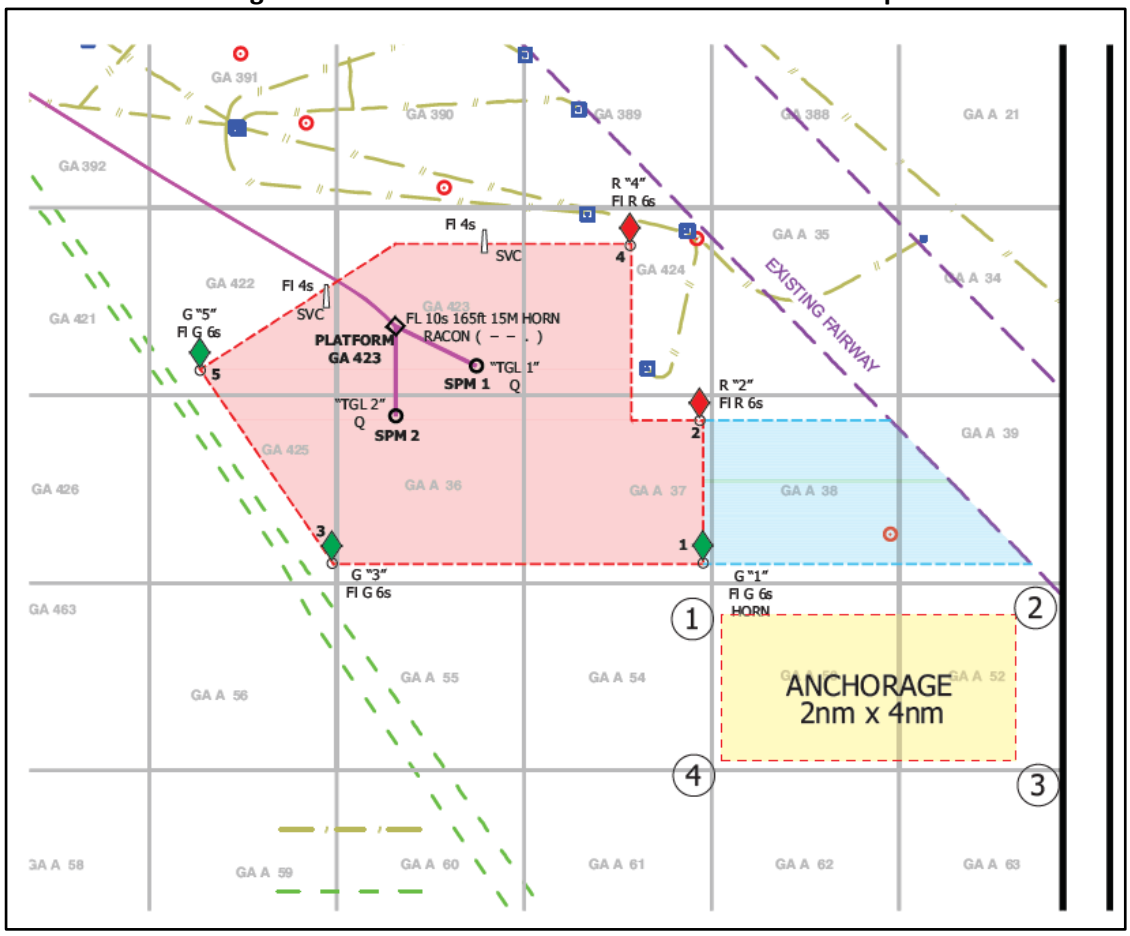


Table 7. Proposed Offshore Equipment List

TEXAS GULFLINK PROJECT						
Proposed Offshore Platform Equipment List (2) 4-Piles						
			SIZE			
Platform	**EQUIPMENT**	**LOCATION**	**L(ft**	**W(ft**	**H(ft**	**DESCRIPTION**
Meter	Pig Receiver	Upper	65	20	10	42" P/L from Terminal
Meter	Crane	Upper	20 ft Tail Swing			50 ST 125 ft Boom
Meter	Temporary	Upper	40	10	10	Two Stacked
Meter	Radar System	Upper	10	10	70	Array mounted on 70 ft
Meter	Meter Prover	Cellar	70	20	5	30" Meters
Meter	Sample	Cellar	3	6	5	
Meter	Surge Valve(s)	Cellar	6	3	5	
Meter	Surge Tank (2)	Cellar		15	30	Two Vertical
Meter	Surge Tank	Cellar	8	5	4	Electric (100% Backup)
Meter	Sample Tank	Cellar	4	4	6	36" OD Tank
Meter	Laboratory	Cellar	8	8	10	
Meter	MCC Room	Cellar	20	8	12	Below VTC Room
Meter	Sump System	Sub-Cellar	15	5 OD	7	With Coalescing Plate Pack
Meter	SW HR	All	3	2	3	6 Units 2 per Deck
Meter and	Fire Monitors	Upper/Cella	3	3	4	4 Units 2 per Deck
Meter and	AFFF HR	All	3	2	4	12 Units 4 per Deck
Quarters	Diesel Fuel	Upper	10	10	15	14 Day Run Time Single
Quarters	Living Quarter	Upper	50	35	36	Three Floors
Quarters	Vessel Traffic	Upper	30	15	12	Roof Living Quarters below
Quarters	Helideck	Upper	60	60	8	Above Living Quarters
Quarters	Freshwater	Upper		10	10	Roof Living Quarters below
Quarters	Freshwater	Upper		4 OD	8	Roof Living Quarters below
Quarters	Freshwater	Upper	3	2	3	Roof Living Quarters below
Quarters	HVAC Units	Upper	10	5	5	Roof Living Quarters below
Quarters	Life Boat	Upper	30	10	8	Davit Lowered
Quarters	Davit Crane	Cellar				Retrieval Lifesaving Vessel
Quarters	Jib Crane	Cellar				Quarters Supplies
Quarters	Generators (2)	Cellar	15	8	10	Two Diesel (100% Backup)
Quarters	Transfer	Cellar	2	2	5	Wall Mounted in MCC Room
Quarters	Storage	Cellar	20	8	12	
Quarters	Inert Gas Skid	Sub-Cellar	8	6	5	
Quarters	Air	Sub-Cellar	15	10	10	Vertical Receiver 48" OD 6 ft
Quarters	Fire Fighting	Sub-Cellar	8	15	10	Diesel Pump
Quarters	Rescue Boat	Sub-Cellar	25	10	9	Launch and Recovery Davit
Quarters	Sewage Unit	Sub-Cellar	4	8	6	
Quarters	Freshwater	Sub-Cellar	6	5	8	Pump with 48" OD x 7ft Tank

§148.105(l)(3) Aids to Navigation

The following table outlines the components, safety zone, SVC buoys, proposed anchorage area, safety approach fairway, and other miscellaneous information that is used to aid in navigation.

Table 4. Texas GulfLink Location Chart

TBS Ref	Description	Easting	Northing	Latitude-N	Longitude-W	Depth (ft)
	COMPONENTS					
	Platform	3,243,263.2	13,406,478.0	28°-33'08.98"	95°-01'42.35"	104
	SPM 1 (east)	3,250,074.6	13,403,117.8	28°-32'33.43"	95°-00'27.30"	106
	SPM 2 (south)	3,243,263.2	13,398,882.9	28°-31'53.82"	95°-01'45.24"	106
	SAFETY ZONE					
1	SZ NE corner, Buoy 4	3,263,199.0	13,413,433.5	28°-34'11.05"	94°-57'56.23"	104
2	SZ NW corner	3,243,263.2	13,413,433.5	28°-34'17.81"	95°-01'39.70"	103
3	SZ W corner, Buoy 5	3,226,710.9	13,402,800.3	28°-32'38.12"	95°-04'49.24"	104
4	SZ SW corner, Buoy 3	3,238,033.1	13,386,389.2	28°-29'51.95"	95°-02'48.58"	113
5	SZ SE corner, Buoy 1	3,269,275.1	13,386,389.2	28°-29'41.36"	94°-56'58.63"	116
6	SZ N entrance, Buoy 2	3,269,275.1	13,398,541.4	28°-31'41.61"	94°-56'53.91"	111
7	SZ inside corner	3,263,199.0	13,398,541.4	28°-31'43.69"	94°-58'01.99"	111
	SVC BUOYS					
23	Svc Buoy 1	3,252,187.8	13,412,544.4	28°-34'06.00"	95°-00"00.00"	103
24	Svc Buoy 2	3,236,311.5	13,407,153.9	28°-33'18.00"	95°-00'03.00"	103
	ANCHORAGE AREA					
1	NW corner	3,270,878.0	13,382,029.9	28°-28'57.68"	94°-56'42.37"	119
2	NE corner	3,295,182.5	13,382,029.9	28°-28'49.26"	94°-52'10.18"	121
3	SE corner	3,295,182.5	13,369,877.7	28°-26'49.01"	94°-52'14.99	126
4	SW corner	3,270,878.0	13,369,877.7	28°-26'57.43"	94°-56'47.09"	127
	SAFETY APPROACH FAIRWAY					
6	NW corner, Buoy 2	3,269,275.1	13,398,541.4	28°-31'41.61"	94°-56'53.91"	111
5	SW corner, Buoy 1	3,269,275.1	13,386,389.2	28°-29'41.36"	94°-56'58.63"	116
9	SE corner	3,297.026.6	13,386,389.2	28°-29'-31.75"	94°-51'47.80"	119
8	NE corner	3,285,101.7	13,398,541.4	28°-31'36.15"	94°-53'56.59"	113

Description	Lease Blocks
PLATFORM	GA 423
SPM 1	GA 423
SPM 2	GA A 36
SAFETY ZONE	GA A 36, GA A 37, GA 422, GA 423, GA 424, GA 425
APPROACH SAFETY FAIRWAY	GA A 38, GA A 39
ANCHORAGE	GA A 52, GA A 53
PIPELINE (federal blocks)	GA 362, 363, 380, 381, 391, 392, 393, 422, 423, BA 342, 364, GA A 36
PIPELINE (state blocks)	BA 308, 336, 341, 342, 392, 396, 403, 413,

Description of Area	Controlling Depth	Note
Texas GulfLink Safety Zone	104 ft	Svc Buoys delineate 103 depth
Approach Safety Fairway	107 ft	AWOIS dragged to 108 ft
Anchorage Area	118 ft	Outside of Safety Zone

Platform Identification

Placards will be mounted on the platform to display the name of the deepwater port and the name or number identifying the structure, as per 33 CFR §149.570, so that the information is visible:

- From the water at all angles of approach to the structure
- From aircraft on approach on the Helicopter Pad
- At least 12 inches high, in vertical block style
- Displayed against a contrasting background

Platform RADAR Beacon

An FCC-accepted RACON radar beacon (RACON) will be located on the Metering Platform tower as per 33 CFR §149.580.

The RACON must transmit:

- In both 2900–3100 MHz and 9300–9500 MHz frequency bands; or
- Transmit a signal of at least 250 milliwatts radiated power that is omni- directional and polarized in the horizontal plane;
- Transmit a two-element or more Morse code character, the length of which does not exceed 25 percent of the radar range expected to be used by vessels operating in the area;
- If of the frequency agile type, be programmed so that it will respond at least 40 percent of the time, but not more than 90 percent of the time, with a response-time duration of at least 24 seconds; and
- Will be located at a minimum height of 15 ft. above the highest deck of the platform and where the structure of the platform, or equipment mounted on the platform, does not obstruct the signal propagation in any direction.

The 33 CFR §67.10-10 operating requirements will be met as the Vessel Traffic Controller will be on duty 24-hours per day and be responsible for activating the signal whenever visibility is less than 5 nm in any direction and securing the signal when required. Sound signal tests will be conducted as per 33 CFR §67.10-20 (Sound Signal Tests) in the presence of a Coast Guard representative, who certifies the test if the procedures comply with the requirements of this section. GulfLink will follow the requirements of §67.10-25 when submitting an application for the sound tests.

Hose String Lights

The hose strings will be marked at each end with a light on the pick-up float, flashing yellow, 50-70 times per minute, visible all around the horizon for 2 miles, 1 meter above the water.

Platform Obstruction Lights

Both of the GulfLink platforms, in the platform complex, will be fitted with obstruction lights on each corner, each light to have a 360° lens, and all lights shall be operated to flash in unison.

- The lights will be visible at a distance of at least five nautical miles.
- The lights shall be displayed not less than 20 ft. above mean high water
- The lights shall all be mounted on the same horizontal plane within the limitations of height specified in 33CFR§67.20-5, §67.25-5, or §67.30-5, as applicable.
- All obstruction lights shall be installed in a manner which will permit at least one of them to be carried in sight of the mariner, regardless of the angle of approach, until the mariner is within 50 ft. of the structure, visibility permitting.

- All obstruction lights will be powered from a reliable power source, including auxiliary power sources. They shall display a white quick-flash characteristic of approximately 60 flashes per minute.
- Obstruction lights shall be displayed at all times between the hours of sunset and sunrise, local time, commencing at the time the construction of a structure is begun.
- During construction and until such time as a platform capable of supporting the obstruction lights is completed, the fixed lights on an attending vessel shall be used. In addition, when lights are in use for general illumination to facilitate the construction or operation of a structure, and can be seen from any angle of approach at a distance equal to that prescribed for the obstruction lights for the class of structure, the actual operation of obstruction lights also will not be required.

Platform Rotating Beacon

In addition to obstruction lights, the Metering Platform will have a lit rotating beacon that distinguishes the deepwater port from other surrounding offshore structures as per 33CFR §149.555 (additional specs will be provided).

- Have an effective intensity of at least 15,000 candela;
- Flash a white light at least once every 20 seconds;
- Operate in wind speeds of up to 100 knots at a rotation rate that is within 6 percent of the operating speed displayed on the beacon;
- Have one or more leveling indicators permanently attached to the light, each with an accuracy of ±0.25 ° or better; and
- Located: At least 60 ft. (about 18.3 meters) above mean high water, not obstructed in any direction, visible all around the horizon.

Sound Signal

The GulfLink platform complex will have a sound signal, approved under subpart 67.10 of this chapter, that has a 2-mile range as per 33CFR§149.585.

- Located at least 10 feet, but not more than 150 feet, above mean high water, unobstructed
- Have its maximum intensity at a frequency between 100 and 1,100 Hertz;
- Sound a 2-second blast every 20 seconds (2 seconds sound, 18 seconds silence)
- Have the rated range required by §67.20-10, §67.25-10, or §67.30-10;
- Have a height not exceeding 25 feet;
- Have not more than eight sound sources;
- Approved by the Coast Guard under §67.10-15; and be permanently marked with:
    (1) The date of Coast Guard approval;
    (2) The manufacturer and date of manufacture;
    (3) A model designation;
    (4) The approved range; and
    (5) The power necessary to comply with the provisions of paragraph (c) of this section

Table 8. Proposed Buoy Locations

Description	Name	Depth	Latitude	Longitude	Characteristic	Height	Range	Structure	Remarks
Safety Zone Boundary	GulfLink Fairway Lighted Buoy 1	116 ft	28-29'41" N	094-56'59" W	Fl G 6s	12	75c	Pillar Green	Radar Reflector 2nm Private Aid HORN 0.5nm
	GulfLink Fairway Lighted Buoy 2	111 ft	28-31'42" N	094-56'54" W	Fl R 6s	12	75c	Pillar Red	Radar Reflector 2nm Private Aid
	GulfLink Fairway Lighted Buoy 3	113 ft	28-29'52" N	095-02'49" W	Fl G 6s	12	75c	Pillar Green	Radar Reflector 2nm Private Aid
	GulfLink Fairway Lighted Buoy 4	104 ft	28-43'11" N	094-57'56" W	Fl R 6s	12	75c	Pillar Red	Radar Reflector 2nm Private Aid
	GulfLink Fairway Lighted Buoy 5	104 ft	28-32'38" N	095-04'49" W	Fl G 6s	12	75c	Pillar Green	Radar Reflector 2nm Private Aid
SPM 1	GulfLink Lighted Mooring "TGL 1"	106 ft	28-32'33" N	095-00'27" W	Q W	15	5	yellow	Private Aid Placard "Texas GulfLink SPM 1"
SPM 2	GulfLink Lighted Mooring "TGL 2"	106 ft	28-31'54" N	095-01'45" W	Q W	15	5	Yellow	Private Aid Placard "Texas GulfLink SPM 2"
Hose String	SPM Hoses (4)				Q Y	4	2	Orange Float	Hose End Float 50-70 per min
Service Mooring Buoys	GulfLink Lighted Mooring Buoy SVC-1	103 ft	28-34'00" N	095-00'00" W	Fl W 4s	8		White	Radar Reflector Private Aid
	GulfLink Lighted Mooring Buoy SVC-2	103 ft	28-33'00" N	095-03'00" W	Fl W 4s	8		White	Radar Reflector Private Aid

Marine Terminal Platform	GulfLink Platform Complex	104 ft	28-33'09" N	095-01'42" W		165		on platform	RACON: G(–··) HORN 2s (20s)
	(8) Obstruction Lights				Q W 1s	90	5		Outboard Corners flash in Unison
	Rotating Beacon				Fl W 15s	165	15,000c		On Tower

As per 33 CFR §66.01-5 GulfLink will submit an application for approval, to the USCG, for all the above listed private aids to Navigation at least 180 days before the installation of any structure at the Deepwater Port.

CALM Buoy Obstruction Lights

Obstruction lights will be fitted on the CALM mooring buoy as per 33 CFR §149.540 and located at least 10 ft above mean high water.

CALM Buoy Identifying Placard

The SPMs will have identifying placards mounted to indicate the number of the SPM.

Navigation Buoys defining Safety Zone

Five (5) privately-maintained navigational spar buoys will be provided to define the limits of the proposed Safety Zone. The buoys will have RADAR reflectors, day marks, lights FL 6s G or R, 15ft height. Buoy 1 will have a horn sound signal with a range of .5nm.

RADAR Beacon (RACON)

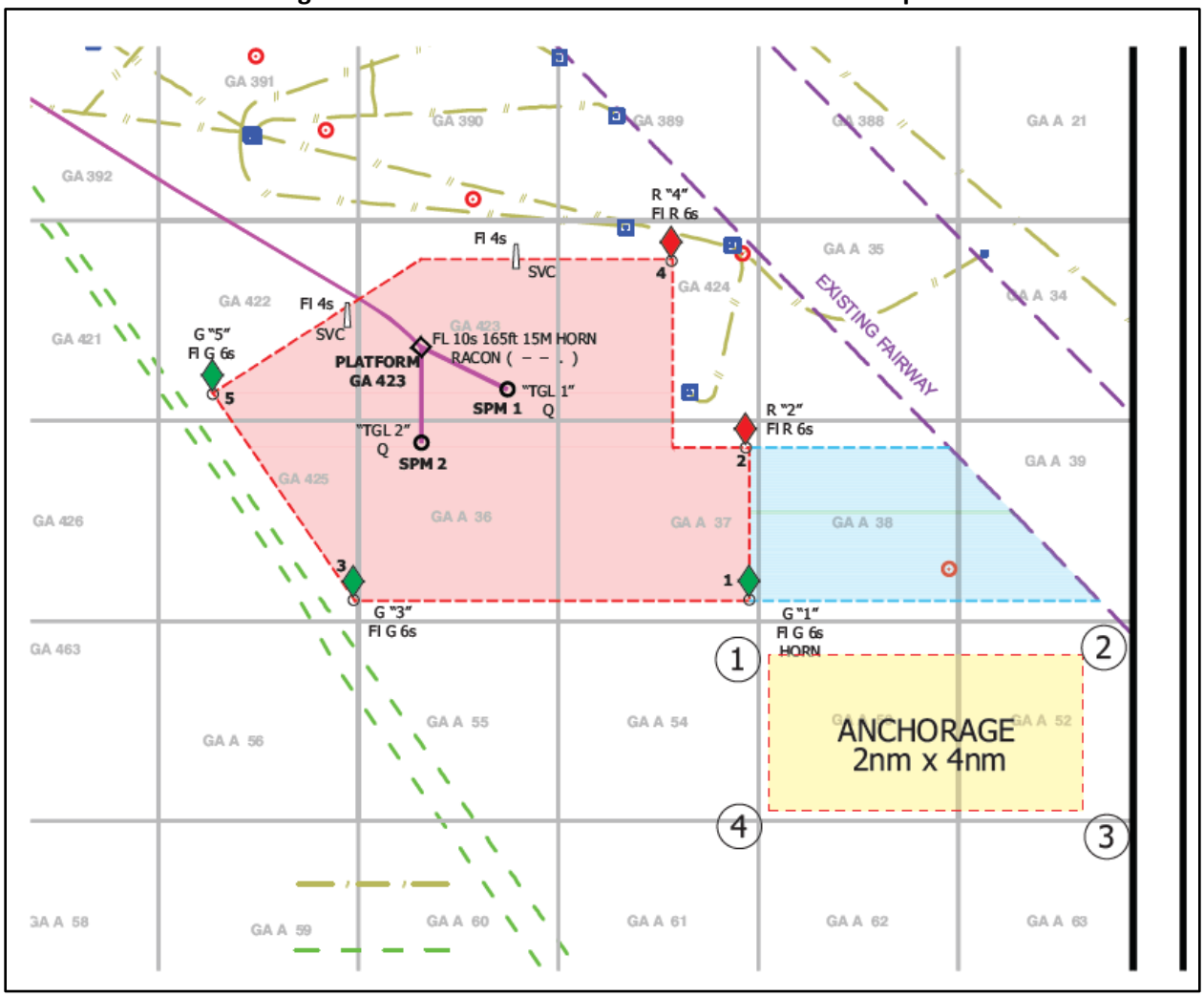
Marine Terminal Platform

An FCC-accepted RACON RADAR beacon (RACON) will be located on the *Metering Platform* tower as per 33 CFR §149.580 at 165ft height and a Radiated power of 600 milliwatts, 15nm range.

The RACON must transmit:

- In both 2900–3100 MHz and 9300– 9500 MHz frequency bands; or
- Transmit a signal of at least 250 milliwatts radiated power that is omni-directional and polarized in the horizontal plane;
- Transmit a two-element or more Morse code character, the length of which does not exceed 25 percent of the radar range expected to be used by vessels operating in the area;
- If of the frequency agile type, be programmed so that it will respond at least 40 percent of the time, but not more than 90 percent of the time, with a response-time duration of at least 24 seconds; and
- Will be located at a minimum height of 20 ft. above the highest deck of the platform and where the structure of the platform, or equipment mounted on the platform, does not obstruct the signal propagation in any direction.

Figure 5. Texas GulfLink Marine Terminal Location Map



§148.105(l)(4) Manifold Systems

Both proposed SPM buoys will have a pipeline end manifold (PLEM) located 1.25nm from the platform on the seafloor. Each PLEM will have hydraulically-activated isolation valves. Two underbuoy 24-inch marine hoses will connect the PLEM to the SPM CALM. See Volume IV, Appendix E, Vendor Examples of SPM Design [**Confidential**].

Figure 6. Proposed PLEM Top View

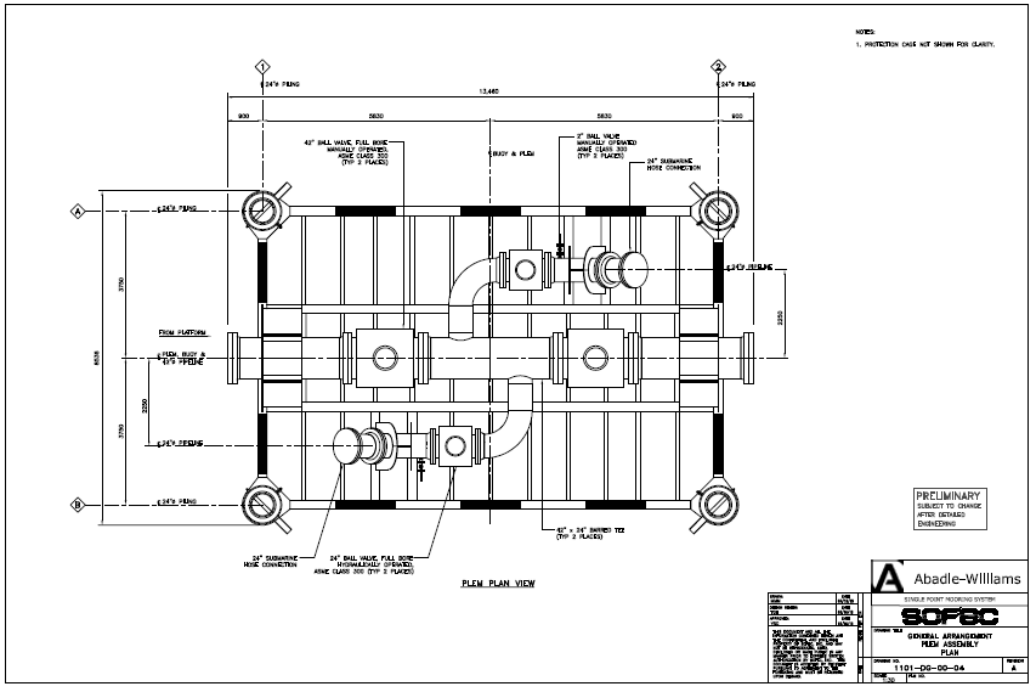
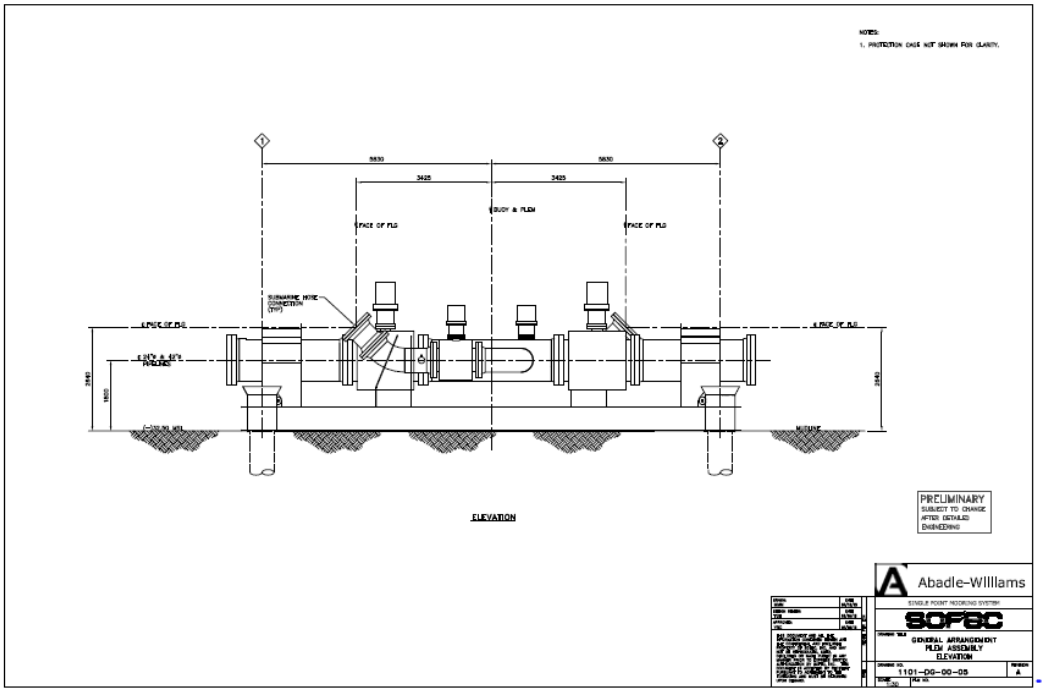


Figure 7. Proposed PLEM Side View



§148.105(l)(5) Onshore Storage Areas, Pipelines, and Refineries

The proposed onshore storage/supply components for the TGL Project would consist of:

- One (1) proposed tank storage facility in Jones Creek (Brazoria County) with eight (8) above-ground external floating roof storage tanks, each with a total storage capacity of 708,168 bbls of crude oil storage capacity, for a total onshore storage capacity of approximately 5.67 million barrels of crude oil.
- One (1) proposed 9.45 statute mile 36-inch outside diameter pipeline originating at the Department of Energy (DOE) facility in Bryan Mound with connectivity to the Houston market.
- One (1) 12.45 statute mile 42-inch outside diameter connection from the new Jones Creek Terminal to the shore crossing where this becomes the subsea pipeline supplying the TGL DWP.

Jones Creek Terminal

A new tank storage facility would be constructed in Jones Creek to provide interconnectivity with the crude oil supply network for the proposed Project. This new storage facility would include the following equipment:

- Two (2) incoming custody transfer meter skids, each with 3 or 4 helical turbine meters would be placed within the proposed Jones Creek Terminal. One (1) skid would be located at the incoming pipeline and one (1) skid would be located at the outgoing pipeline header leading to the TGL DWP.
- Separate sampling systems for each of the two custody transfer skids and one (1) shared displacement prover.
- Three (3) electric-driven vertical can pumps to drain dry the tanks and provide sufficient suction pressure for the mainline centrifugal pumps.
- Six (6) variable frequency drive, electric-driven centrifugal pumps to pump crude oil at or up to 1,480 psig to provide maximum flow of 85,000 BPH to the DWP. All pumps would be variable speed to accommodate adjustable flow rates.
- One (1) pig launching trap for the 42-inch pipeline.
- One (1) pig receiver trap for the 36-inch incoming pipeline.
- One (1) emergency generator for continued use during loss of commercial power.
- One (1) firewater pump and freshwater well to address tank seal fires and small facility emergencies. A firewater tank would be constructed and designed to contain up to the working capacity needed to respond to a tank seal fire. In the event of a fire, water from the firewater tank would be used to contain the fire. A foam system would be used to extinguish fires up to a tank seal fire. The firewater and foam system at the proposed Jones Creek Terminal would be designed in accordance with NFPA requirements.
- Central operations control center (OCC) for overall controls of the pipelines and tank facility using Supervisory Control and Data Acquisition (SCADA) microwave communications.
- Vapor combustor units would be installed at the proposed Jones Creek Terminal to destroy VOC vapors during tank maintenance or inspection activities while the tank roof is set on legs.
- Ancillary facilities at the Jones Creek Terminal would include an electrical substation providing electrical service to all systems at the Jones Creek Terminal and office and warehouse buildings. The electrical substation would be powered via the existing electrical transmission line located adjacent to the Jones Creek Terminal site.

Incoming Pipeline to Jones Creek Terminal

One (1) proposed 36-inch outside diameter pipeline would be constructed from the existing DOE Terminal to the proposed Jones Creek Terminal. This 9.45 statute-mile pipeline would be located in Brazoria County, Texas. This pipeline would generally follow a West and northerly route to the Jones Creek Terminal following existing energy infrastructure, to the extent practicable. During operation, a 30-foot permanent ROW would be maintained for the pipeline where available.

The incoming pipeline to Jones Creek Terminal would have a new pig launcher constructed at the origination point at/near the existing DOE Terminal and would also have a new pig receiver constructed at the termination point within the proposed Jones Creek Terminal.

Jones Creek Terminal to Shore Crossing Pipeline

One (1) proposed 42-inch outside diameter crude oil pipeline would be routed from the proposed Jones Creek Terminal to the shore crossing where this becomes the subsea pipeline supplying the TGL DWP. This 12.45 statute-mile pipeline would be located in Brazoria County, Texas, and would generally follow an East and southerly route. During operation, a 30-foot permanent ROW would be maintained for the single pipeline, and 50-foot ROW for the 42-inch and 36-inch combined, where available.

For execution plan, see Volume II, Appendix C, Proposed HDD Execution Plan.

See Volume II, Appendix D for Proposed Onshore Pipeline Routing & Alignment Maps.

The Texas GulfLink Deepwater Port and onshore assets do not have a direct connection with any domestic, United States refineries.

33 CFR §148.105(m) Site Plan for Marine Components

§148.105(m)(1) Overall Marine Components Site Plan

A site plan consisting of the following:

The proposed size and location of all:

(i) Fixed and floating structures and associated components seaward of the high-water mark, only if the proposal does not involve a connected action, for example, installation of new pipeline extending inshore of the state boundary line;

(ii) Recommended ships' routing measures and proposed vessel traffic patterns in the port area, including aids to navigation;

(iii) Recommended anchorage areas and, for support vessels, mooring areas.

(m)(1)(i) Fixed and Floating Structures

Fixed and floating structures and associated components seaward of the high-water mark, located at the interface of Brazoria County and Texas State Waters in the Gulf of Mexico. The offshore components consist of approximately 28.3 nm of 42-inch OD crude oil pipeline connecting to a riser at the new platform which then connects to two (2) SPM Buoy Systems connected by separate 42-inch lateral pipelines, on each, 1.25 nm away. The offshore pipeline will intersect portions of the Texas state submerged lease tracts, 392, 396, 403, 413, 308, 336 and 341, and OCS BA TX BOEM blocks 342, 364, GA363, GA362, GA380, GA381, GA 393, GA392, GA391, GA422, GA423 and GA336.

The proposed platforms and SPM Buoy System 1 would be installed offshore, in the Gulf of Mexico, at BOEM GA 423. The proposed SPM Buoy System 2 will be installed in the Gulf of Mexico, at BOEM GA A 36. The platforms will consist of the platform jacket, deck, piling, appurtenances and topsides as well as three (3) three 42-inch OD risers. The two (2) outgoing pipeline risers for the pipelines connecting the platforms to the PLEMS would be located at Latitude N28°33'08.98" and Longitude W95°01'42.35". SPM Buoy System No. 1 is located at Latitude N28°32'33.43" and Longitude W95°00'27.30" and the SPM Buoy System No 2 is located at Latitude N28°31'53.82" and Longitude W95°01'45.24". Each SPM Buoy System consists of a PLEM, CALM system, mooring hawsers, two (2) 24-inch under buoy hoses, and two (2) 24-inch floating hoses for the transfer of crude oil from the SPM Buoy System to the vessels moored at the SPM. See Volume II, Appendix B, Site Plan Drawings.

(m)(1)(ii) Vessel Routing Measures and Traffic Patterns

The recommended approach routes to the GulfLink Deepwater Port will be from southeast using the existing Freeport Safety Fairway. VLCC Tankers will approach from the southeast and either proceed West into the GulfLink Approach Safety Fairway and meet the Mooring Master outside of Buoy 1 and 2, or anchor outside. Tankers will enter the proposed Safety Zone between Buoy R "2" and G "1" under the guidance of the Mooring Master. Shallow draft Tankers may also approach from the North using the existing Safety Fairway and proceed West into the Approach Safety Fairway and meet the Mooring Master outside of Buoy 1 and 2, or anchor outside. Tankers will enter the Safety Zone between Buoy R "2" and G "1" under the guidance of the Mooring Master. Recommended maximum speed for Pilot Boarding is 3 – 4 knots, Safety Zone 6 kts, within 1 nm of SPM 3 kts, when mooring (~700ft from SPM) 0.7kts. The maneuvering area around the SPM is 0.6nm. Tankers will approach the SPM stemming the combined forces of current and wind.

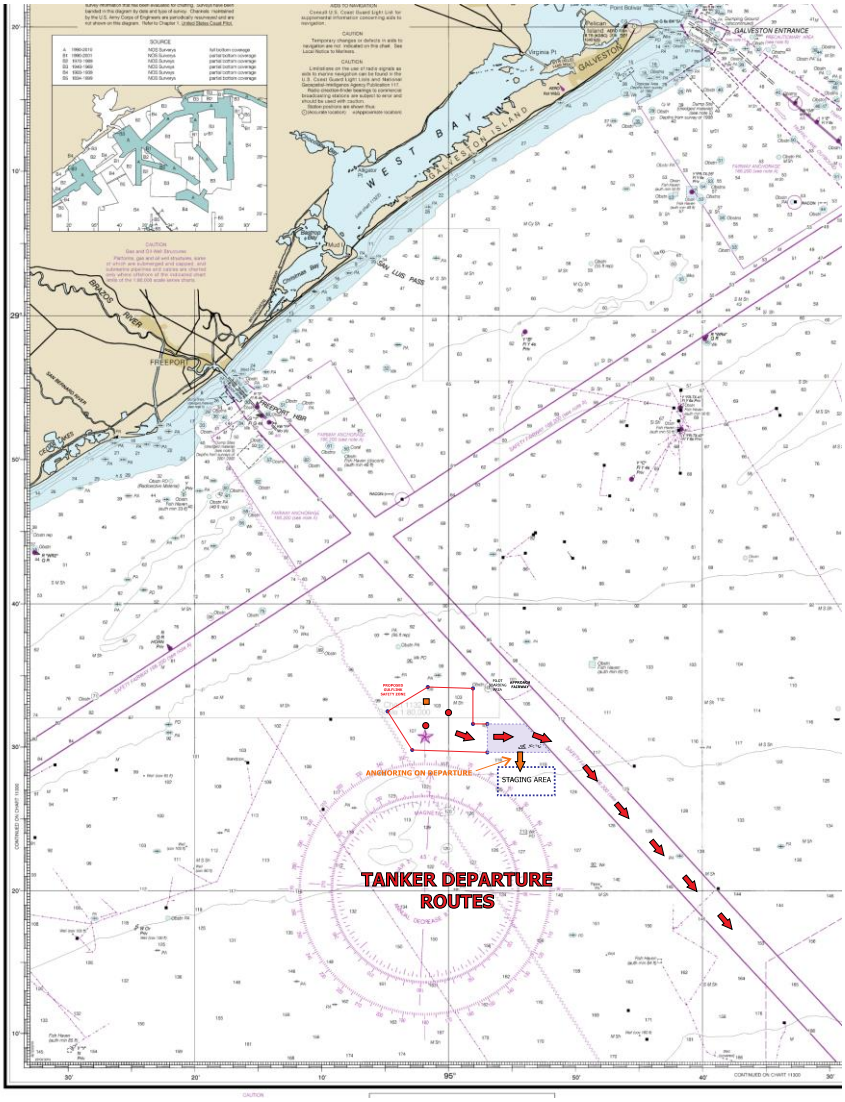
The recommended departure route, after disembarking the Mooring Master outside of Buoys 1 and 2, will be to either proceed East to the junction with the proposed Safety Fairway and then follow the Safety Fairway to the southeast, or after disembarking the Mooring Master and proceed South to anchor.

While the following lease blocks do not contain Texas GulfLink deepwater port infrastructure, they are affected due to vessel access, port safety zone, and proposed anchorage area. These blocks are: GA 424, GA A 37, GA A 38, GA A 39, GA A 52, and GA A 53.

Detailed information on Net Under Keel Clearance Calculations are presented in Volume IV, Appendix D, Operations Manual, Section 7 [**Confidential**].

Figure 8. Departure Routes from Texas GulfLink Deepwater Port

DEPARTURES ROUTES FROM GULFLINK DEEPWATER PORT



LEGEND	DRAWN BY: Captain Dan Harris	**TEXAS GULFLINK PROJECT**	
RECOMMENDED DEPARTURE ROUTES	DATE: 12 APRIL 2019	DEPARTURES FROM GULFLINK DEEPWATER PORT	
RECOMMENDED ROUTE ANCHORING ON DEPARTURE	DWG NAME: DWP CHART DEPARTURE		
	SHEET 1 of 1	REV: 01	REV DATE:
		ABADIE -WILLIAMS	

Figure 9. Recommended Maximum Approach Speeds

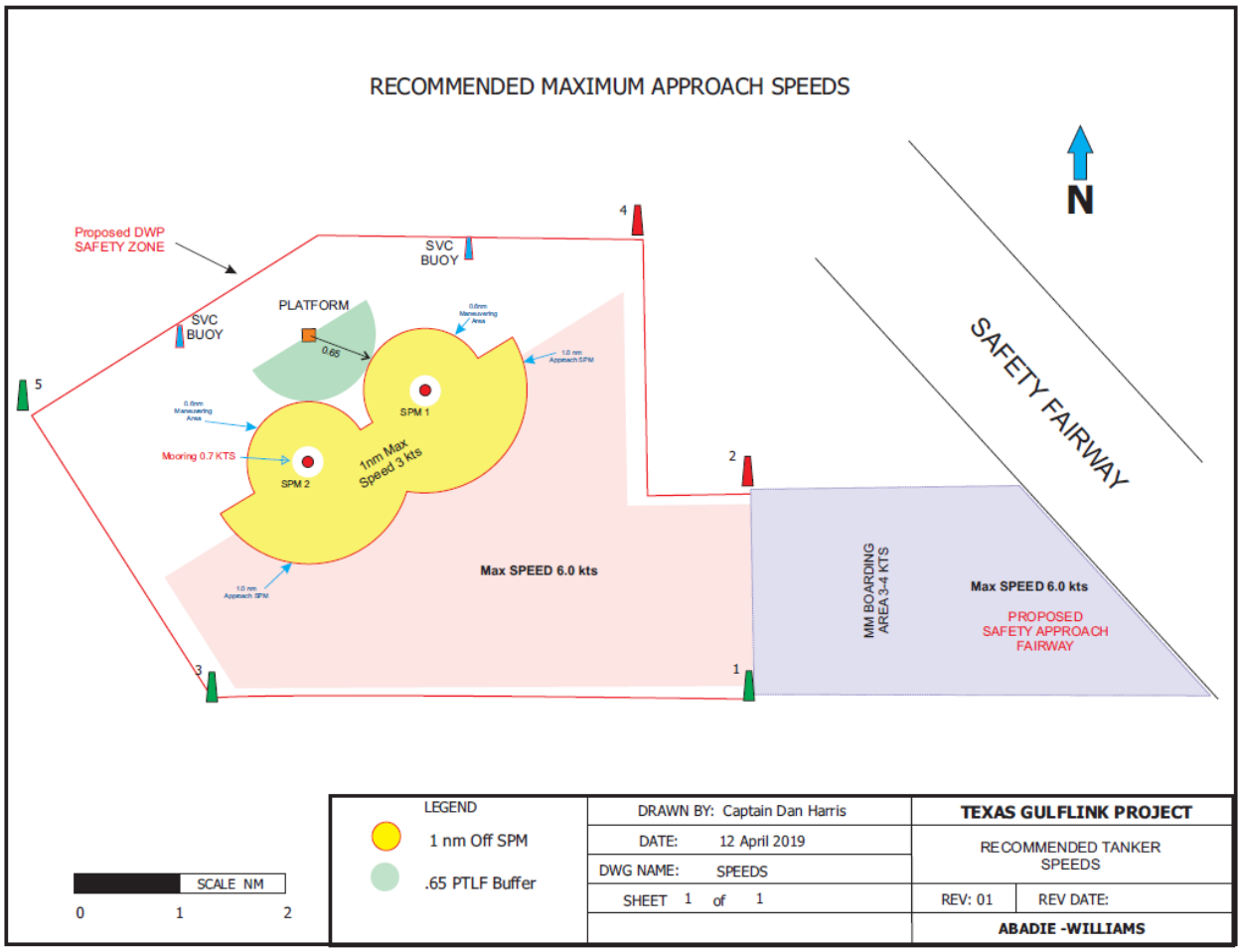


Figure 10. Texas GulfLink Deepwater Port SPM Unmooring Departure Tracks

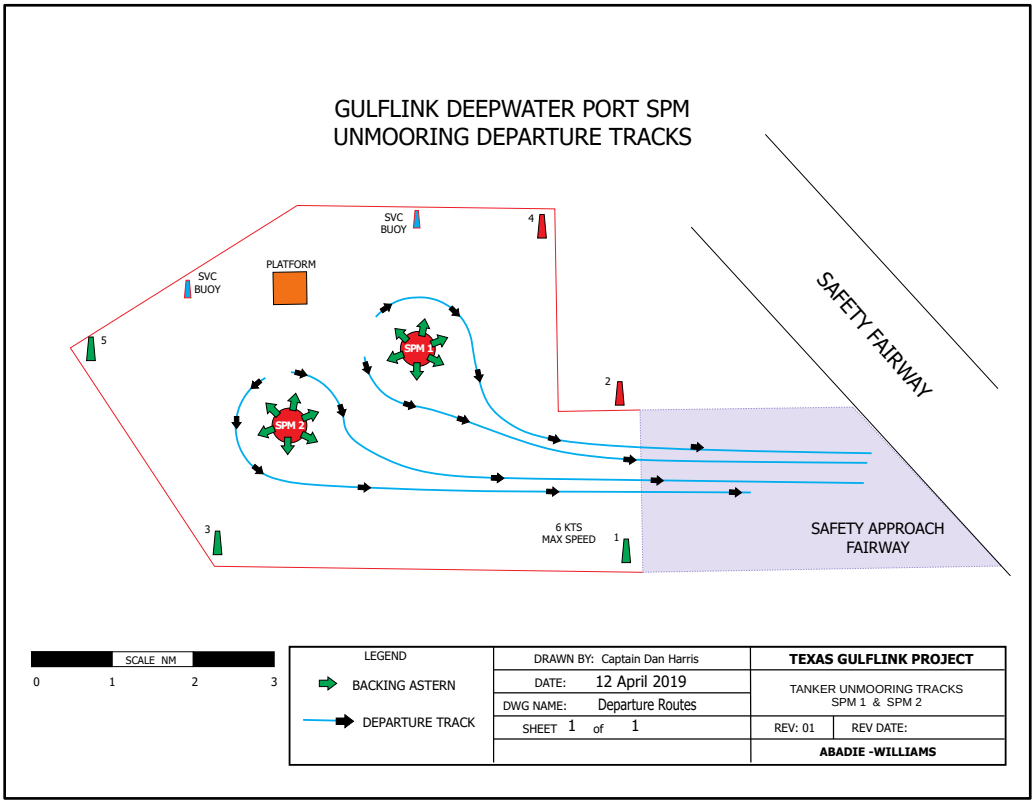
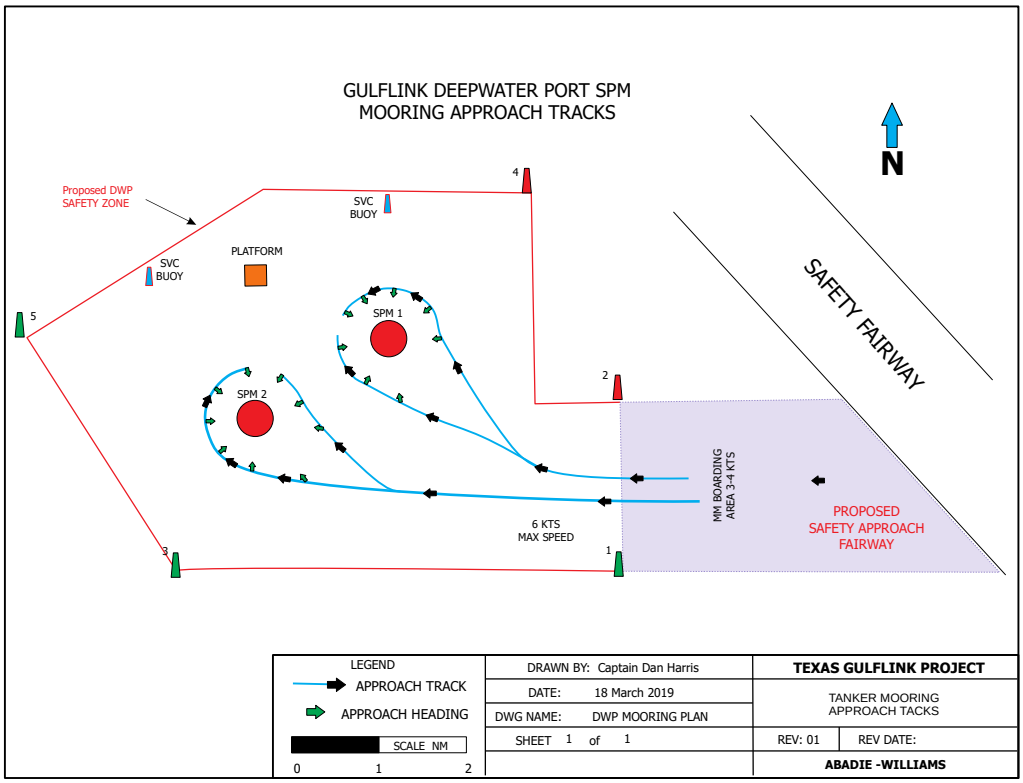


Figure 11. Texas GulfLink Deepwater Port SPM Mooring Approach Tracks



(m)(1)(iii) Anchorage Area

Note: Provided the USCG designates an Anchorage Area

No anchorage area will be designated inside the proposed Texas GulfLink Deepwater Port Safety Zone. A Tanker Anchorage Area, 2nm x 4nm, is proposed about 0.5nm south of the GulfLink Safety Approach Fairway in Blocks GA A 52 and GA A 53. The proposed area will not have any privately maintained navigational boundary buoys. Tankers intending to load cargo at the Texas GulfLink Deepwater Port may utilize this area. No bunkering operations will be permitted within this anchoring area, however, taking on stores will be permitted. The Texas GulfLink Vessel Traffic Controller will not assign a specific anchoring location. Tanker Masters will make the decision where to anchor in relationship to the water depth, holding ground, bottom obstructions, pipelines, and other Tankers anchored there. Upon anchoring, the Tanker shall advise the Vessel Traffic Controller of the anchoring time. The proposed Outside Anchorage Area is bounded by rhumb lines joining the following points:

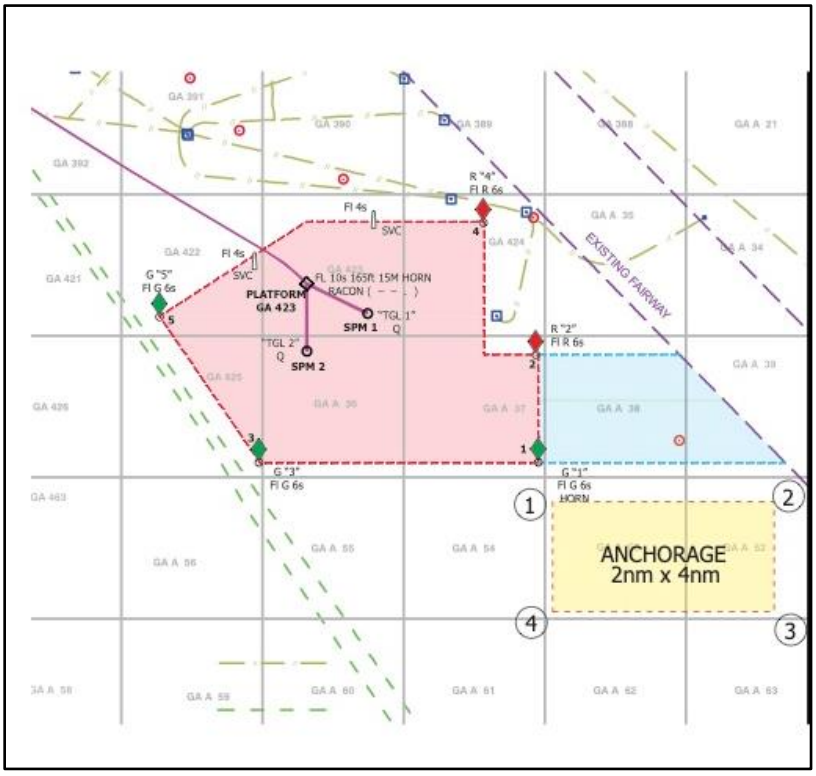
[1]	28°-28’57.68” N	094°-56’42.37” W
[2]	28°-28’49.26” N	094°-52’10.18” W
[3]	28°-26’49.01” N	094°-52’14.99” W
[4]	28°-26’57.43” N	094°-56’47.09” W

Support Boats Service Buoys

There will be (2) two service mooring buoys located on the back side of the Platform Complex. The location of the buoys is intended to help define the proposed Safety Zone limits and allow the support boats to watch the area of the Safety Zone blocked from the Control Platform’s control room windows. The buoy moorings will be suitable to allow (2) two of the Support Boats to moor on a single buoy.

[1]	28° - 34’06.00” N	95° - 00’00.00” W
[2]	28° - 33’18.00” N	95° - 00’03.00” W

Figure 5. Texas GulfLink Marine Terminal Location Map



§148.105(m)(2) Hydrographic Survey

A reconnaissance hydrographic survey of the proposed marine site. This survey should provide data on the water depth, prevailing currents, cultural resources, and a general characterization of the sea bottom. A requirement to submit an engineering hydrographic survey of the final marine site will be imposed as a condition in the license. The latter survey will require more extensive analysis of the soil, and detailed study to determine its physical composition, such as minerals, and if the sea bottom can support fixed components comprising a deepwater port. The applicant may submit existing data, gathered within the previous 5 years, but it must be supplemented by field data for the specific locations in which a high degree of variability exists.

Texas GulfLink utilized T. Baker Smith, Geo-Marine, Inc., Search, Inc., and CSA Ocean Services to perform the offshore hydrographic, reconnaissance, hazard, cultural resources, and archaeological surveys.

The surveys covered the proposed 42-inch OD offshore pipeline, proposed two (2) 4-pile platforms, proposed two (2) platform complex to SPM 42-inch OD offshore pipelines, pipeline end manifolds (PLEM), and single point mooring (SPM) buoy locations.

For the initial application submittal, considerations for construction equipment anchoring, sea conditions, and minor adjustments were incorporated into the survey scope of work to include a 1500 to 3000-ft. corridor on both sides of the proposed pipeline centerline, and 500-ft. radius around each proposed fixed structure.

While some anomalies were noted; no major avoidances have been confirmed through data interpretation, historical record reviewal, cultural resource investigation, and geological review. Several

areas noted within the Volume II Appendix E – Offshore Archeological Report, Volume III Appendix S, Offshore Cultural Resources Report and Volume III, Appendix R, Offshore Survey Report may require additional investigation or consideration during construction planning.

The entirety of the proposed offshore safety zone, which will be specified at a later date through the Deepwater Port Application process and in coordination with the United States Coast Guard, was also surveyed for a separate hydrographic, reconnaissance, hazard, cultural resource, and archaeological investigation. This will be submitted in conjunction with the offshore soil borings and stability investigations further within the licensing process as allowed by 33 CFR 148.105(n). However, a desktop study based on historical findings within the limits specified by 33 CFR 148.105(n) was performed by Fugro USA Marine, Inc., which can be found in Volume IV, Appendix B, Soil Data.

33 CFR §148.105(n) Soil Data

33 CFR §148.105(n)(1) Soil Suitability

An analysis of the general character and condition of the ocean bottom, sub-bottom, and upland soils throughout the marine site. The applicant may use existing data, so long as it was collected within the last 5 years and continues to provide accurate information about conditions throughout the site. If not, a new survey must be completed to provide supplemental data. The analysis must include an opinion by a registered professional engineer specializing in soil mechanics concerning: The suitability of the soil to accommodate the anticipated design load of each marine component that will be fixed to or supported on the ocean floor.

Offshore project components that will be supported by the sea bottom include:

- Approximately 28.3 nm, 42-inch OD delivery pipeline from the exit point of the Direct Drill crossing to the platform facility. The pipeline will be buried to a minimum of 3 ft. below the natural sea bottom to the top of pipeline along the pipeline route. The pipeline will be buried ten-ft. below the natural sea bottom to the top of pipeline at the shipping fairway crossing.
- Two 1.25 nautical mile lateral 42-inch OD offshore pipelines from the platform to each SPM. The lateral pipelines will be buried to a minimum of 3 ft. below the natural sea bottom to the top of pipe.
- A platform that will be secured to the sea bottom with piles driven by hydraulic hammers in approximately 104 ft. water depth.
- Two SPMs and associated PLEMS in approximately 104 ft. water depth.

In order to confirm the suitability of the soils to support the above referenced project components, the following studies have been performed:

- Offshore Reconnaissance Survey in Volume III, Appendix R, Offshore Survey Report
- Offshore Hazard Survey in Volume III, Appendix R, Offshore Survey Report
- Offshore Archeological Survey in Volume II, Appendix E
- Offshore Desktop Soil Boring Survey in Volume IV, Appendix B [**Confidential**]
- Offshore Acoustic Sampling in Volume III, Appendix E
- Offshore Sediment Sampling in Volume III, Appendix S
- Offshore Proposed Pipeline Route, Platform and SPM Buoy Location in Volume III, Appendix R, Offshore Survey Report

The Offshore pipeline route and shore crossing surveys have confirmed the following:

- Existing pipelines along the proposed pipeline route have been proven stable with the exception of the abandoned Transco and Seagull Energy pipeline which have less than the required 3 ft. of the required burial below the sea bottom.
- The direct drill crossing from the shoreline will be able to be drilled with a safe profile to allow the transition from land to the exit point allowing a safe transition for the offshore pipeline installation.

The Offshore Desktop Soil Boring Survey (Volume IV, Appendix B, Soil Data [**Confidential**]) at the offshore platform and the SPM locations provided verification that the soils are:

- Capable of supporting the pile supported platform with the local environment conditions and the piles can be driven safely with existing pile driving equipment and minimal impact to the sea bottom.
- Capable of supporting the PLEM structure and safely secure the SPM buoy and loading hoses with piles during operating and severe storm conditions.

Platforms and SPMs

Information obtained from the Offshore Desktop Soil Boring Survey (Volume IV, Appendix B, Soil Data [**Confidential**]) at a nearby Block location in similar water depth allowed pile capacity curves to be developed confirming that the existing soils in the area can safely support the piled platform, PLEM structure, and mooring foundations to maintain the position of the SPM structure.

Pipelines

The offshore pipeline route originates from the coastline West of the Brazos River. The water depths range from zero (0) ft. at the coastline and terminates in approximately 104 ft. water depth. The route crosses the Brazos delta, Freeport Rocks, Freeport Bathymetric High and a Shipping Fairway. The Beaumont Formation (Fm) may be composed of very stiff, sandy clays along the proposed pipeline route. The Beaumont Fm occurs below the subsurface throughout the route. In some places the overlying unconsolidated Holocene sediment varies to less than 2 ft. above the Beaumont Fm. Further soil borings will be taken in the areas in which the pipeline will be buried in the Beaumont Fm. Additional borings will be taken in the Freeport Rocks area to define the composition of the material which could encourage altering the route for a more favorable excavation scenario. Since the areas approaching, within and exiting the shipping fairway will transition to 10 ft. of burial within the fairway from the top of the pipeline to the sea bottom, these areas will require an adequate number of borings. The Freeport Bathymetric High will require additional borings to confirm the depth of the overlying sand and the depth of the Beaumont Fm. Shear strengths will be utilized to determine the best equipment required to perform any pre-trenching if required and post burial equipment.

The 42” offshore pipeline offshore pipeline from the shoreline to the offshore platform would cross two submerged buried cables and five existing submerged buried pipelines. Only one of the pipelines (ExxonMobil) is considered active.

The crossing details will be designed in coordination with the owners of the pipelines and cables. There are two options to cross the existing pipelines associated with the project. One option would be to route the TGL 42-inch pipeline under the existing pipelines. The second option is to lower the existing pipeline and route the TGL 42-inch pipeline over the existing pipelines. For both options, 18-inch vertical separation would be maintained using concrete bag, mats, or a combination of concrete bags and mats. A minimum of 3 ft. of cover would be maintained at each crossing. This work will be performed with a Dive Support Vessel (DSV) manned with divers and ROV assist when possible.

Based on discussions with contractors, the existing conditions are acceptable to bury the pipeline with existing technology.

Shore Crossings

Based on the Hazard Survey (Volume III, Appendix R), the area from the shoreline to the exit location of the direct drill pipe, due to the activity of the Brazos River, exhibits soft to stiff clay material with some

sandy material included. The conditions presented should not pose any problems for the direct drilling operations.

33 CFR §148.105(n)(2) Seabed Stability

The stability of the seabed when exposed to environmental forces resulting from severe storms or lesser forces that occur over time, including any history of accretion or erosion of the coastline near the marine site.

The Texas GulfLink outgoing 42'' pipeline crosses the Brazoria County, Texas, coastline just southwest of the Brazos River Delta. The existing geomorphology and river hydrology pattern show accretion build-up on the West side of the Brazos River Delta, and additional sediment deposits in Texas State Waters based on upstream watersheds and drainage.

The proposed Texas GulfLink outgoing 42'' pipeline will be installed via a Horizontal Directional Drill, with an outlet in Texas State Waters within the Brazos River Delta region. The location of the offshore pipeline as it travels to the proposed Texas GulfLink offshore marine terminal, will not be subject to any naturally reoccurring forces that cause erosion or seabed removal.

Long term modeling would suggest accretion activities and depositions to continue existing trends depositing silt, sediment, and minerals over the proposed asset location. Major storm events would need to be modeled on an individual basis to give any indication of pipeline cover erosion.

Periodic depth-to-cover surveys will be performed adherent to the proposed integrity management plan, referenced in Volume IV, Appendix J, Proposed Hazardous Liquid Pipeline Integrity Management Program Manual [**Confidential**]. See Volume III, Appendix R, Offshore Survey Report.

33 CFR §148.105(o) Archaeological Information

An analysis of the information from the reconnaissance hydrographic survey by a qualified underwater archeologist to determine the historical or other significance of the area where the site evaluation and pre-construction testing activities were conducted. The analysis must meet standards established by the Bureau of Ocean Energy Management (BOEM) for activities on the Outer Continental Shelf, or an alternative standard that has been submitted to and approved by the Coast Guard. The survey must include the areas potentially affected by the deepwater port, or any other associated platforms, and its pipeline routes.

Texas GulfLink retained SEARCH to assist with its obligations under Section 106 of the National Historic Preservation Act (Public Law 89-665, as amended). The proposed pipeline, designated the Texas GulfLink Pipeline Project (Project), will make landfall on the coast of Texas, approximately 1.3 km (0.8 mi) southwest of the mouth of the Brazos River in Brazoria County, Texas.

Trenching during pipeline construction, the anchoring of work vessels, the installation of the platform and moorings, and future anchoring of tankers have the potential for adverse effects upon potential submerged cultural resources. Texas GulfLink will mitigate any adverse effects upon potential cultural resources by following the recommendations of this study, including further investigation or avoidance where possible. T. Baker Smith collected the remote-sensing data; Geo-Marine Technology, Inc. carried out the processing of all data; and SEARCH conducted cultural resource analysis of the processed data. Field data for this report were collected between March 18 and April 10, 2019, in Federal and Texas State Waters under Texas Antiquities Permit No. 8849.

A total of 742 magnetic anomalies, 113 sub-bottom reflectors, 12 side-scan sonar contacts, four paleo-channels, and one geologic rock outcrop, known as the Freeport Rocks, were detected during the course of the fieldwork and identified in processing. A total of 12 potential historic cultural resources were identified (four in Federal Waters and eight in Texas State Waters), along with five potential pre-historic cultural resources (four in Federal Waters and one in Texas State Waters). Texas GulfLink will work with SEARCH to perform further investigation and analysis to avoid or protect potential submerged cultural resources.

The balance of the remaining magnetic anomalies and acoustic contacts are representative of modern debris most likely associated with the fishing and oil and gas industries. None of these requires further archaeological investigation. None of the 113 sub-bottom reflectors were found to coincide with or overlap any of the magnetic anomalies. These are representative of sediment changes, rocks, or non-ferrous debris, such as fiberglass, and likely do not represent potential submerged cultural resources. No further work is recommended for these 113 reflectors.

See Volume II, Appendix E, Offshore Archaeological Report.

33 CFR §148.105(p) Vessel Operational Information

§148.105(p)(1) Trading Carrier Registry and Nationality of Crew

The nation of registry for, and the nationality or citizenship of, officers and crew serving on board vessels transporting natural gas that are reasonably anticipated to be servicing the deepwater port.

Nationalities of Crew

All of the VLCC Tankers loading at the Texas GulfLink Deepwater Port will be foreign-flagged vessels as the US does not have any VLCCs trading outside of the ALASKA TAPS trade. The nationality of the officers and crews from the different Tanker operators will vary greatly. Many employ multiple nationalities on a single Tanker. Officers include: Eastern Bloc Countries, Indian, Norwegian, Greek, and Asian. The most common nationality of crew members aboard VLCCs is Filipino. Most officers speak "Maritime English" at a minimum and a good number are fluent in English. Communications are rarely an issue.

The OCIMF SIRE vetting program includes elements concerning the licenses, certificates, and endorsements of the entire crew are verified for compliance with STCW requirements. The STCW-78 Convention focused almost entirely on knowledge, the emphasis of STCW-95 has been shifted to practical skills and competence underpinned by theoretical knowledge. The 2010 amendments continued to emphasize competence rather than sea service or period of training. Any discrepancies in compliance with STCW 78, 95 or the 2010 Manila amendments will be noted on the SIRE Vessel Inspection Questionnaire (VIQ). Another element of the VIQ looks at the officer matrix as a whole to determine the overall experience of the officers onboard. The vetting process for nominating Tankers at Texas GulfLink reviews the VIQ Reports as part of the Tanker acceptance policy. SIRE VIQ inspection reports are maintained on the OCIMF index for a period of 12 months from the date of receipt and are maintained on the database for 2 years. SIRE access will be available to GulfLink by subscription.

US Coast Guard A Notice of Arrival Program (NOA)

The US Coast Guard NOA regulations require all vessels intending to call at a US port, including deepwater ports, to provide information relevant to the security of the vessel and its crew, and the vessel's suitability for loading cargo at a port of place in the United States. The NOA is required to be provided 96 hours before the vessel's arrival to the port and includes the below information on the vessel and crew sufficient for the Coast Guard to conduct a robust safety and security review of the vessel and its crew.

Table 9. NOA Information Items (33 CFR §160.206)

Required information	Vessels neither carrying CDC nor controlling another vessel carrying CDC	Vessels carrying CDC or controlling another vessel carrying CDC
(1) *Vessel Information:*		
(i) Name;	X	X
(ii) Name of the registered owner;	X	X
(iii) Country of registry;	X	X
(iv) Call sign;	X	X
(v) International Maritime Organization (IMO) international number or, if vessel does not have an assigned IMO international number, substitute with official number;	X	X
(vi) Name of the operator;	X	X
(vii) Name of charterer;	X	X
(viii) Name of classification society or recognized organization;	X	X
(ix) Maritime Mobile Service Identity (MMSI) number, if applicable;	X	X
(x) Whether the vessel is 300 gross tons or less (yes or no); and	X	X
(xi) USCG Vessel Response Plan Control Number, if applicable.	X	X
(2) *Voyage Information:*		
(i) Names of last five foreign ports or places visited;	X	X
(ii) Dates of arrival and departure for last five foreign ports or places visited;	X	X
(iii) For the port or place of the United States to be visited, list the name of the receiving facility, the port or place, the city, and the state;	X	X
(iv) For the port or place of the United States to be visited, the estimated date and time of arrival;	X	X
(v) For the port or place in the United States to be visited, the estimated date and time of departure;	X	X
(vi) The location (port or place and country) or position (latitude and longitude or waterway and mile marker) of the vessel at the time of reporting;	X	X

(vii) The name and telephone number of a 24-hour point of contact;	X	X
(viii) Whether the vessel's voyage time is less than 24 hours (yes or no);	X	X
(ix) Last port or place of departure; and	X	X
(x) Dates of arrival and departure for last port or place of departure.	X	X
(3) ***Cargo Information:***		
(i) A general description of cargo, other than CDC, on board the vessel (e.g., grain, container, oil, etc.);	X	X
(ii) Name of each CDC carried, including cargo UN number, if applicable; and		X
(iii) Amount of each CDC carried.		X
(**4**) ***Information for each Crewmember On Board:***		
(i) Full name;	X	X
(ii) Date of birth;	X	X
(iii) Nationality;	X	X
(iv) Passport* or mariner's document number (type of identification and number);	X	X
(v) Position or duties on the vessel; and	X	X
(vi) Where the crewmember embarked (list port or place and country).	X	X
(5) ***Information for each Person On Board in Addition to Crew:***		
(i) Full name;	X	X
(ii) Date of birth;	X	X
(iii) Nationality;	X	X
(iv) Passport number;* and	X	X
(v) Where the person embarked (list port or place and country).	X	X
(6) ***Operational condition of equipment required by 33 CFR part 164 of this chapter (see note to table):***	X	X
(7) ***International Safety Management (ISM) Code Notice:***		
(i) The date of expiration for the company's Document of Compliance certificate that covers the vessel;	X	X

(ii) The date of expiration for the vessel's Safety Management Certificate; and	X	X
(iii) The name of the Flag Administration, or the recognized organization(s) representing the vessel Flag Administration, that issued those certificates.	X	X
(8) *International Ship and Port Facility Security Code (ISPS) Notice:*		
(i) The date of issuance for the vessel's International Ship Security Certificate (ISSC), if any;	X	X
(ii) Whether the ISSC, if any, is an initial Interim ISSC, subsequent and consecutive Interim ISSC, or final ISSC;	X	X
(iii) Declaration that the approved ship security plan, if any, is being implemented;	X	X
(iv) If a subsequent and consecutive Interim ISSC, the reasons therefore;	X	X
(v) The name and 24-hour contact information for the Company Security Officer; and	X	X
(vi) The name of the Flag Administration or the recognized security organization(s) representing the vessel Flag Administration that issued the ISSC.	X	X

§148.105(p)(2) Operations Manual Contents Regarding Vessel Operations, Characteristics and Weather Forecasting

Description of the information that will be provided in the operations manual pertaining to vessel operations, vessel characteristics, and weather forecasting.

The Operations Manual

The Operations Manual provided with the application can be found in Volume IV, Appendix D, TGL Operations Manual [**Confidential**]. Some topics listed are in outline form or referenced with a summary and will be incorporated in detail, in the final version. The full version of the Operations Manual will be submitted for review and approval at a later date. Items included are:

A. Navigation information covering approach routes, transit within the proposed Safety Zone, Mooring Approach, Moorings, and recommended departure routes are provided. It also defines clear roles between the Master of the Tanker and the Mooring Master in operations.
B. A geographic and physical description of the Deepwater Port, including lease block identification, with components, structures, and information on requested Safety Zone, ATBA, and proposed Anchorage Areas in detail. Charts, sketches, and drawings are provided for reference.

C. Detailed, step-by-step instructions on Mooring Operations, while identifying responsibilities, and precautions.
D. A discussion on the impact of vessel navigation in the area and nearby VLCC lightering operations.
E. The anticipated Tanker types, quantity, frequency, and projected loading rates.
F. Procedures for vetting Tankers, verifying required OCIMF equipment is fitted, and maneuvering capabilities.
G. A detailed analysis of the net under UKC with all factors applied, in three operating conditions.
H. Weather operational limits of the port for mooring, departing the moorings, and severe weather advisories.
I. A comprehensive historical analysis of the weather specific to the DWP and projections for anticipated weather conditions. Weather forecasting service contract with Wilkens.
J. Operational limits for Mooring Tankers and for Departing the SPM with detailed information for adverse weather unmooring operations.
K. Identification of Support Boats including characteristic, outfitting, manning, and duties at each phase of operations.
L. SCADA System and the Oil Movement Controller's Role.
M. Ballast water Procedures for Tankers.
N. VOC Reduction Policy linked to the Tanker VOC Plan.
O. Extensive discussion of procedures from the nominating of a Tanker to the mooring at the SPM, including communications, notices, and instructions.
P. Detailed, set-by-step instructions on Cargo Transfer Operations, with duties, responsibilities, precautions, and emergency shut down procedures. A discussion on the Oil Transfer Systems (OTS) components.

Frequency and Volume of Tankers anticipated

Allowing for eight weather delay days, the Texas GulfLink Deepwater Port should have about 357 days available annually for loading operations. The maximum loading rate will be 85,000 bph. Using an average loading rate of 60,000 bph or ~33 hrs to load a VLCC, the maximum number of Tankers loaded could reach 257 VLCCs annually or about 21 Tankers per month for a pure VLCC queue, loading full. The average frequency of Tankers loaded will be about 200 annually or 17 per month (1,100,000 bbls/day) allowing for deliveries to the storage tanks and a 39-hour port turnaround for each Tanker.

Table 10. Typical VLCC Port Schedule for Loading Full Cargo ~ 2,000,000 bbls

Hours	Hours of Operation	Cumulative Hours
Arrival Pilot Boarding Area	0	0
Inbound Transit to SPM	2.5	2.5
Mooring Operations	0.5	3.0
Connecting Hoses	1.0	4.0
Initial Load @ reduce rate (30,00bbls)	2.0	6.0
Loading @ max rate (1,910,000bbls)	28.0	34.0
Topping Off @ reduced rate (60,000bbls)	2.0	36.0
Disconnecting Hoses	1.0	37.0
Unmooring Operations & Clear SPM	0.75	37.75
Outbound Transit (Departure Safety Zone)	1.25	39.0
LOADING TIME	32.0	
TOTAL TIME	39.0	

Tanker Particulars

Some of the key players expected to load Crude Oil Tankers at GulfLink include: AET, Teekay Corporation, Sovcomflot Group, Overseas Shipholding Group (OSG), OMAN SHIPPING COMPANY S.A.O.C., NYK line, Ocean Tankers (pte) Ltd., Mitsui O.S.K. Lines, Ltd. (MOL)., Maran Tankers Management Inc., Frontline Ltd., Euronav, Dynacom Tankers Management Ltd, China Shipping Development Corp (CSDC), and Bahri.

The VLCC Tanker will be the most frequent class of Tanker to load at GulfLink Deepwater Port with an estimated 95% of the total Tankers. The remaining 5% will likely be Suez Max Tankers. The typical VLCC is 330m LOA, 60m Beam, cargo capacity between 2m – 2.1m bbls, with a loaded draft between 21.5m - 22.5m and a summer DWT between 295,000 - 320,000DWT. Some VLCCs will arrive in a partially loaded condition and some will only load a smaller parcel such as 500,000bbls, or 1M bbls. Many of the VLCC tankers will be backloading the cargo at GulfLink after delivery of an import cargo for the US by lightering or discharging at LOOP.

In 2018, there were about 716 VLCCs around the world. Scrapping of outdated Tankers is on the rise but the figure about equals the 65 new VLCCs on order for 2019. China operates the largest VLCC fleet with 49 Tankers and Bahri of Saudi Arabia is next with 45 VLCCs. Generally speaking, there is a surplus of VLCC tonnage available and the VLCC charter rates have been weak with the excess tonnage. On occasion, an Aframax, Panamax, or Handy Tanker may load cargo, particularly when the Cargo Pipeline offshore has a distressed cargo that must be cleared.

Table 11. Tanker Class Information

Tanker Class	DWT	Cargo M^3	Crew
HANDY	10,000 - 40,000	29400	20
PANAMAX	60,000 - 80,000	77420	26
AFRAMAX	80,000 - 120,000	120148	28
SUEZMAX	120,000 - 200,000	166600	32
VLCC	200,000 - 340,000	333200	32

Table 12. Types of Modern Oil Tankers

(http://www.glo.texas.gov/ost/acp/HoustonGalvestonHSRGuide.pdf**)**

Types of modern oil tanker

Panamax tankers

Ships in the 55-70,000 dwt size range, 70,000 dwt being the maximum size tanker able to transit the Panama Canal. The need to pass through a series of Canal locks dictates a maximum length of 274.3 metres and maximum breadth of 32.3 metres. In the Atlantic Basin trades Panamax vessels have a competitive advantage over larger tankers due to physical trading and local port depth restrictions. North American imports of crude and fuel oil comprise the bulk of Panamax tanker business.

Typical double hull ship of 60,000 dwt. 228.6 m length overall x 32.2 m breadth x 12.6 m draft - Lightship: 11,000 tons of steel

Aframax tankers

Tankers in the 75,000-120,000 dwt size range. AFRA is Average Freight Rate Assessment. At one time Aframax was used to refer to ships up to 79,999 dwt, the upper limit of one of six deadweight groups for which the the AFRA rate is assessed. Aframax has since become a general term for ships in this overall size range. Aframax ships are traditionally employed on a wide variety of short and medium-haul crude oil trades. The biggest tanker that can be accommodated fully laden in the ports of the US - the world's largest importer of oil - is 100,000 dwt, and this only at a limited number of ports. Many of the more modern ships in the Aframax size range are built as long-haul product tankers, with epoxy-coated tanks.

Typical double hull ship of 100,000 dwt. 253.0 m length overall x 44.2 m breadth x 11.6 m draft - Lightship: 14,850 tons of steel

Suezmax tankers

Suezmax tankers are ships in the 120,000-200,000 dwt size range and are generally identified as those capable of lifting one million barrel cargoes. The name was originally bestowed on such ships because from 1980, when a development project which deepened the waterway to 16.1 metres was completed, the largest tankers able to transit the Suez Canal fully laden were those of 140,000-150,000 dwt. This association will effectively become redundant later this year when a project to deepen the Canal to 18.9 metres is completed. The Canal may be further deepened to 20.1 metres by 2005 and 22.0 metres by 2010.

Typical double hull ship of 150,000 dwt. 274.0 m length overall x 50.0 m breadth x 14.5 m draft - Lightship: 20,000 tons of steel

Very large crude carriers (VLCCs)

VLCCs are tankers in the 200,000-320,000 dwt size range. Ships of this size were prompted by the rapid growth in global oil consumption during the 1960s and, in 1967, closure of the Suez Canal, necessitating voyages around the Cape of Good Hope. Today, VLCCs are the most effective way of transporting large volumes of oil, including 2-million barrel cargoes, to customers over relatively long distances. Relatively simple ships, VLCCs are subdivided into a number of cargo tanks by two longitudinal and several transverse bulkheads.

Typical double hull ship of 280,000 dwt. 335.0 m length overall x 57.0 m breadth x 21.0 m draft - Lightship: 35,000 tons of steel

Ultra large crude carriers (ULCCs)

Tankers in excess of 320,000 dwt. Most ships of this type were built in the mid to late 1970s and are now approaching 25 years of age. Ordered to take advantage of the economies of scale in a buoyant market, they were delivered as oil prices skyrocketed and demand collapsed. There are now under 40 of these ships remaining. Rather inflexible and limited to serving a few deepwater ports, ULCCs never achieved their full potential. In early 2000 a tanker owner ordered two 440,000 dwt ULCCs, with 2 options, the first ULCC order in 20 years.

Typical double hull ship of 410,000 dwt. 377.0 m length overall x 68.0 m breadth x 23.0 m draft - Lightship: 45,000 tons of steel

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6 The TANKER Newsletter

Tanker Vetting Process

GulfLink will utilize its own in-house vetting program to screen prospective Tankers to load prior to assigning them to the loading queue. Any Tanker intending to load at GulfLink Deepwater Port will be evaluated to determine that they meet Texas GulfLink standards prior to being accepted. Scheduling must confirm with the Port Superintendent that a particular Tanker is acceptable.

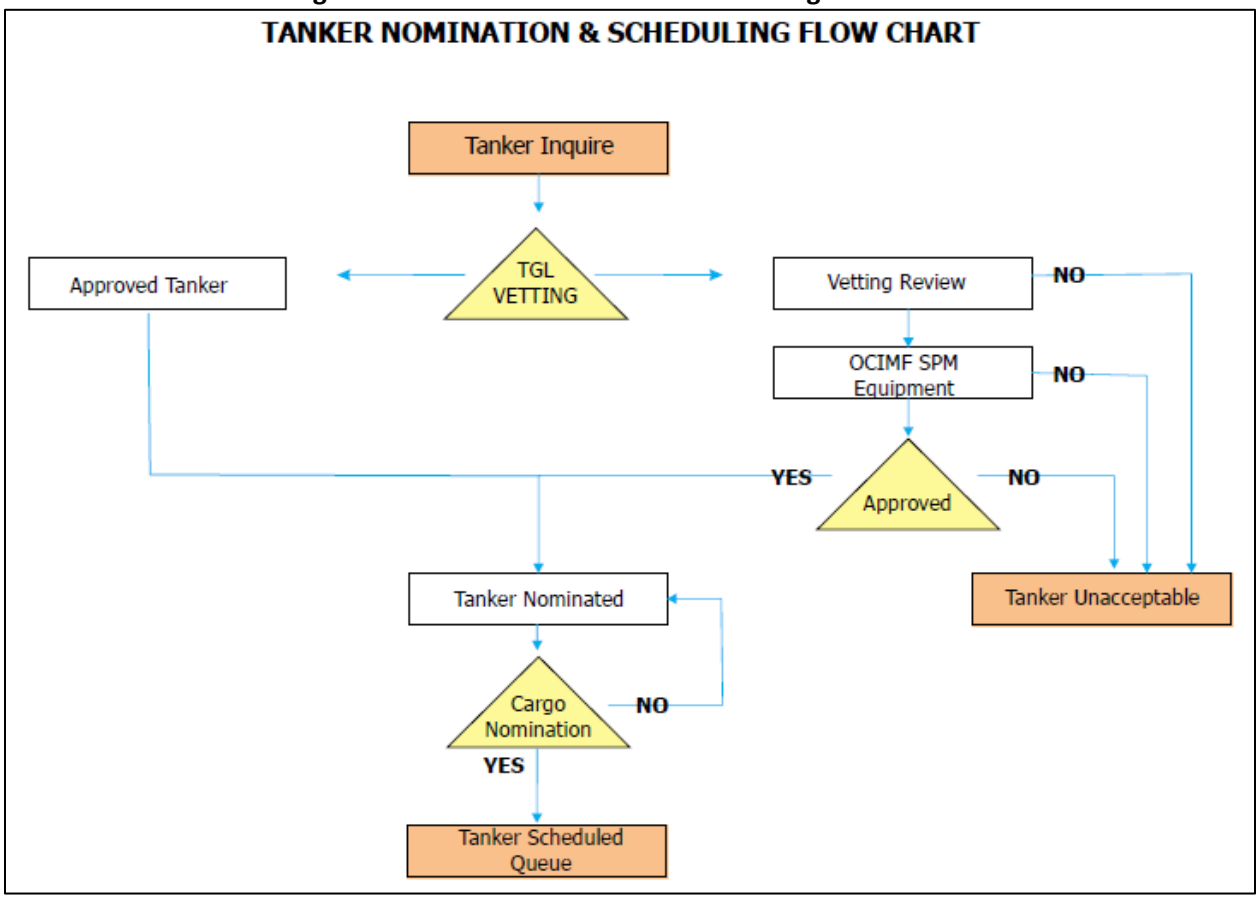
The in-house vetting program will include a joint review by a qualified Mooring Master and the Port Superintendent. The Mooring Master will be experienced in OCIMF SIRE vetting process and inspection reports. At a minimum a review of the current OCIMF VPQ or Q88 Report and any OCIMF VIQ SIRE inspection reports that may be available must be conducted. Particular attention will be given to any class deficiency notations, port state detentions, valid certificates, and any deficiency remarks. Tankers should have an approved SIRE report on record within the past year.

Foreign Tankers shall hold a valid Certificate of Compliance (COC) from the USCG and US Tankers shall hold a valid Certificate of Inspection (COI). Tankers not meeting the Texas GulfLink requirements will not be allowed to load cargo and the Port Superintendent will advise Scheduling of the determination, who will notify the Tanker and/or Tanker Operator that a particular vessel is not acceptable.

Minimum Required Tanker Equipment

- 20-ton Cargo Hose Crane > 150,000 DWT
- 15-ton Cargo Hose Crane < 150,000 DWT
- 10-ton Cargo Hose Crane < 50,000 DWT
- (2) 76mm OCIMF approved Bow Chain Stoppers > 125,000 DWT
- (1) 76mm OCIMF approved Bow Chain Stopper < 125,000 DWT
- (2) 16” manifold connections
- Oil Transfer Equipment conforming to the technical recommendations of OCIMF
- Bow arrangement conforming to the technical recommendations of OCIMF for SPMs

Figure 12. Tanker Nomination & Scheduling Flow Chart



Weather Summary

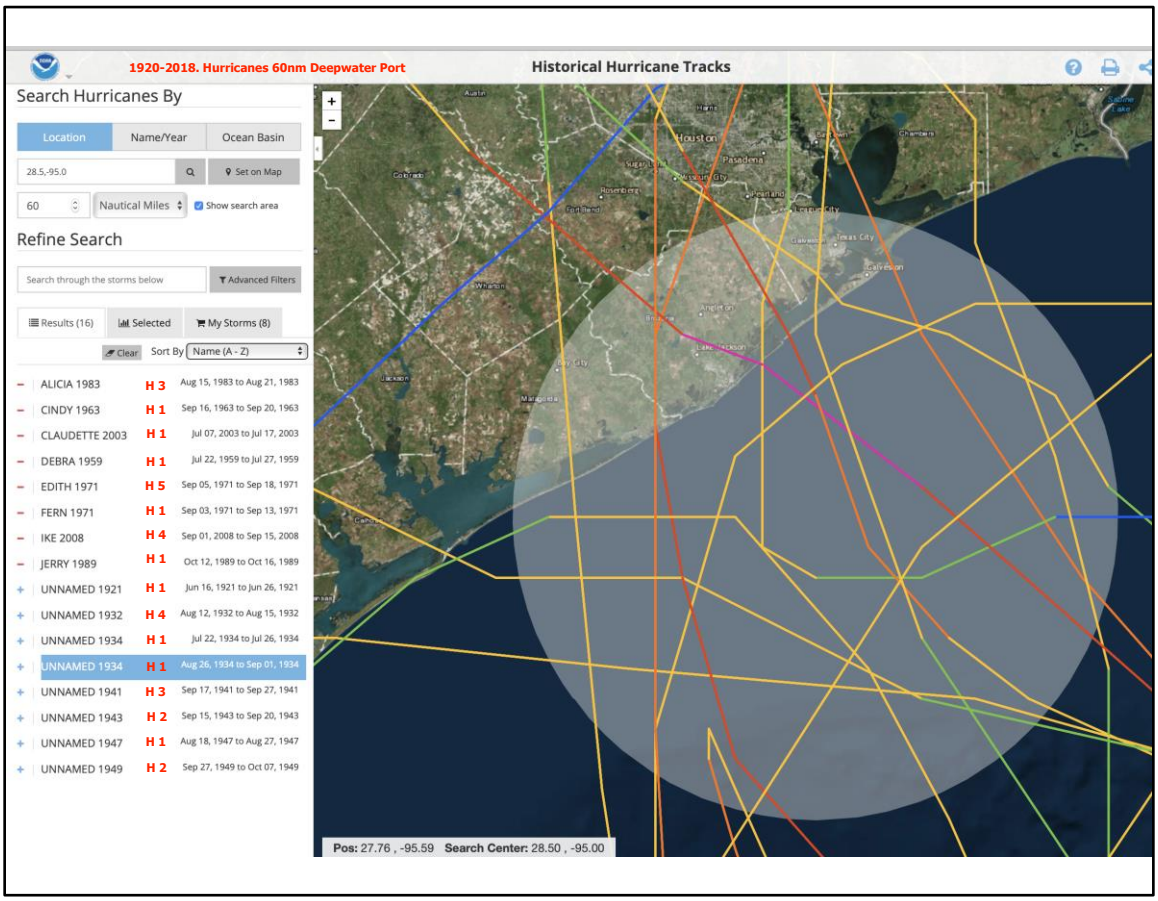
Wilkins Weather provided 26 years of weather data specific to 28°-30N and 095°-00W using WAVE WATCH III / Ocean Model Software. NOAA buoy 42019 was the closest weather buoy at 39nm away. NOAA buoy 42035 is 52nm away, off Galveston, and its historical weather data was less severe than 42019. We utilized the Wilkins Weather data along with NOAA buoy 42019 to extrapolate our weather summary. Additional weather information and records are provided in Volume II, Appendix A, Raw Weather Data.

The month of January brings the most significant weather elements with 20 knot winds 20% of the time. The wind direction is variable from the N to S with an equal distribution and an average wind speed of 15 knots. In the summer months the wind is light and variable from the E to SW with 63% of the time below 10 kts. The swell is SE for the first half of the year, SSE for the summer, then ESE for the fall months, and variable for the winter months with an E -> S component. The average significant wave height is 5 ft in the winter and 3 ft. in the summer. The average temperature range is from 63° in the month of January to 84° in the month of August.

Since 1920, there have been sixteen hurricanes with paths within 60 nm of the Texas GulfLink Marine Terminal. Maximum hurricane strength developed for the entire path was: Nine were Category 1 in strength; in 1943 & 1949, two were Category 2; the 1941 storm and Alicia, in 1983, were each Category 3s; the 1932 storm and Ike, in 2008, were Category 4s; and Edith, in 1971, was the only Category 5. The highest category hurricane within the 60nm radius of the Texas GulfLink Deepwater Port was a Category

4 storm in 1932, clocked at 130mph, followed by a 1941 Category 3 with winds clocked at 110mph, and Alicia in 1983 Category 3 @ 100mph.

Figure 13. Hurricanes 1920-2018



HURRICANE 1920 -2018
60 nm Radius of GulfLink Deepwater Port
28.5N 95.0W

Name	Year	Max Cat.	GL. Cat	Max Wind MPH @ GulfLink (60nm)
Alicia	1983	3	3	100
Cindy	1963	1	1	70
Claudette	2003	1	1	80
Debra	1959	1	1	75
Edith	1971	5	1	80
Fern	1971	1	1	75
Ike	2008	4	2	95
Jerry	1989	1	1	75
1921	1921	1	1	80
1932	**1932**	**4**	**4**	**130**
1934	1934	1	1	75
1934	1934	1	1	70

1941	1941	3	3	110
1943	1943	2	2	85
1947	1947	1	1	70
19149	1949	2	2	95

Fog

Sea fog poses a significant challenge to marine operations in the northern Gulf of Mexico. Sea fog forms when warm, moist air moves over colder water and cools to its dew point temperature, causing the air to saturate. This type of fog is favored over the northern Gulf during Winter and Spring as the higher frequency of cold fronts moving offshore cools the continental shelf waters, bays, and coastal waterways. It is less frequent in regions where the Sea Surface Temperatures (SSTs) remain above 20°C (68°F).

The extent of the cooler near shore waters and wind direction over that area affects the density and duration of sea fog events. An East to east-southeast wind that nearly parallels the northern Gulf Coast provides the best trajectory for heavy sea fog (visibility <1/2nm). Unlike inland radiation fog, sea fog persists until the air mass is changed by a frontal passage and may remain in place even when winds are 10 to 15 knots offshore. An active Winter weather pattern with frequent cold air surges can yield a 50+nm swath of SSTs in the upper 50's to mid-60's across the far northern Gulf of Mexico. These temperatures lay the groundwork for potentially long-duration dense fog events from late Winter through Spring when the high pressure to the east and onshore flow becomes more persistent.

AVERAGE SEA SURFACE TEMPS: Between December and March, temperatures are 68-70° at the Texas GulfLink Deepwater Port, which would indicate the months of December thru early March as the period where a possibility for fog formation is greater. Often the fog limit is 20nm offshore which would put the Texas GulfLink Deepwater Port just beyond the heaviest fog area.

Port Operational Limits are winds above 30 kts or significant seas above 9 ft. The anticipated average percentage of the time at or above these limits is under 2 %. An allowance of eight weather delay days can be expected including fog formation with under ½ mile visibility. The wildcard exception is that a category 4 or 5 hurricane impacting the Texas GulfLink Deepwater Port area would add additional days. Overall, the weather and sea conditions at our Texas GulfLink Deepwater Port location is within operating limits for cargo loading operations 97% of the time.

Figure 14. Climate Summary

Gulflink Deepwater Port **ANNUAL CLIMATE SUMMARY --> WIND** **26 YEAR AVG**

PERIOD	< 10 KTS WIND	10-15 KTS WIND	>20 KTS WIND	WIND DIRECTION	S	E	SE	N
DEC - MAR	34%	34%	15%	VAR: N -> S	19%	12%	19%	18%
APR - JUNE	37%	38%	4%	SE -> S	30%	11%	38%	6%
JULY - AUG	63%	30%	1%	SE -> S	40%	7%	23%	2%
SEP - NOV	37%	36%	7%	VAR: N -> S	18%	19%	21%	12%

SIGNIFICANT SEA

PERIOD	< 4	4 - 6	> 10	WIND DIRECTION
DEC - FEB	55%	30%	0.5%	VAR: NE -> S
MAR - MAY	55%	29%	0.5%	SE
JUNE-AUG	87%	10%	0.5%	SE -> S
SEP - NOV	69%	21%	0.5%	E -> SE

AVG AIR TEMP F **AVG SIG WAVE**

NOAA BUOY 42019. 1900 - 2008

PERIOD	DEG	WAVE HT
DEC - FEB	64	5
MAR - MAY	71	4.5
JUNE-AUG	82	3
SEP - NOV	77	4

Weather & Seas Conditions and Forecasts

Texas GulfLink will subscribe to a site-specific weather forecasting service provided by (DTN) Weather Services. Post-licensing, Texas GulfLink will execute a contract for services covering both construction and operational phases. Detailed weather conditions and forecast information will be provided for the Texas GulfLink Deepwater Port. Information provided will include: wind, wind gusts, sea state, swell, combined seas, precipitation, storm tracking, and general weather information. Mooring Masters, Vessel Traffic Controller, Port Superintendent, Scheduling, and all key personnel will have direct access to the weather service site and forecasts.

The Mooring Masters are responsible for reviewing current and forecasted weather conditions prior to berthing. The forecasting shall cover the period for the Tankers entire estimated port stay. The Mooring Master will also discuss the weather with the Vessel Traffic Controller during the pre-transit meeting. The Mooring Master will provide the Tanker Master a copy of the latest forecast for review and discuss the weather with the Master.

The Vessel Traffic Controller shall also monitor the weather/seas information provided by the nearest NOAA weather buoy for existing conditions and provide this information when conducting the pre-transit meeting with the Mooring Masters.

A fixed current meter will be installed at the platform to help determine current conditions at various depths. The Vessel Traffic Controller will monitor the current readouts and discuss currents with the Mooring Master during the pre-transit meeting.

Weather Operating Limits of the Teas GulfLink Deepwater Port

Abort Conditions for Mooring Operations at the Marine Terminal

- Sustained wind above 30 knots or wind gusts in excess of 40 knots
- Sea State above 9 feet

- Currents in excess of 3 knots
- Support Boats unable to safely operate (Support Boat Captain feels mooring conditions are unsafe for his or her boat and crew)
- Reduced Visibility < ½ NM

Adverse Weather Alert

The Port will be under an **Adverse Weather Alert** whenever any of the following conditions exist:

- Sustained average winds are at least 35 knots.
- A front is approaching.
- A line of thunderstorms is approaching.

  Actions to be considered:

  - Make fast a support vessel to the stern of any moored Tanker, engine ready.
  - Commence towing if desired to equalize hawser strain.
  - Place moored Tanker's engines on short notice of 10 minutes or less.
  - Monitor hawser strain readings (33 tons high alarm and 65 tons high-high alarm).

The Port will be under a **Severe Weather Alert** whenever:

- Sustained average winds are 40 knots.

  Actions to be considered:

  - Commence towing if desired to equalize hawsers strain.
  - Engines on standby – engine room manned. Radar & Steering Systems running.
  - Monitor hawser strain readings. (33 tons high alarm and 65 tons high-high alarm).
  - Stop loading. Close the manifold valves.
  - Departing the buoy if hoses and hawsers can be safety disconnected.
  - Additional Crew available on deck.
  - Call out Mooring Master or Assistant Mooring Master.

Departing the SPM Moorings - Weather Limits & Conditions

When the present weather or sea conditions are above operational limits or forecasted to trend beyond operational limits, or when the Tanker is unable to maintain its position behind the SPM, the Tanker will make preparations to depart the SPM. The operational limits for departing the SPM are:

- Sustained wind > 40 Knots.
- Seas/Swell > 14 ft.
- SPM Hawser Strain Gauge Monitor System is indicating repetitive upper limit high strain. alarm condition.
- The mooring hawsers' motion is cycling up and down violently in a snapping motion subjecting the core of the hawser to heat buildup.

The decision to depart the SPM shall be made in conjunction with the Mooring Master, Tanker Master, and Port Superintendent, with the Port Superintendent having the final word.

Determining Optimal Time for Mooring Operations

The Mooring Master in conjunction with the Vessel Traffic Controller and Port Superintendent may make a determinization based on the Texas GulfLink schedule open time, rest period considerations, weather trends (including fog), daylight, or other causal factors to either berth a Tanker early or delay the berthing for a more optimal time from the assigned Tanker queue slot.

Weather Monitoring

The Vessel Traffic Controller will be the principle person who continuously monitors the weather and sea conditions. Review of forecasted conditions from various sources including the dedicated Wilkins Weather Service, doppler radar, active radar screen, internet weather apps, and NOAA weather buoy shall be used. Upon learning of upcoming inclement weather, the Vessel Traffic Controller will discuss the forecast with the Port Superintendent and advise the Tanker and personnel accordingly. The course of action will be in accordance with Texas GulfLink Adverse Weather Policies as stated in this manual.

Lightning

The Platform Vessel Traffic Controller Control Room will be fitted with a fixed lightning detection system.

Specific Range Detection of Lightning Activity will be displayed with an audio and visual alarm indicator.

- Level 1: 15 miles – monitor conditions
- Level 2: 10 miles – Alert personnel, elevated work stopped
- Level 2: 10 miles – Alert Tanker to start reducing the loading rate, close mast riser
- Level 3: 7 miles – Stop all work, seek safe shelter
- Level 3: 7 miles – Alert Tanker to suspend loading
  All clear after no strikes within 8 miles for 30 minutes

Tanker Responsibility

The Tanker's Master is responsible for monitoring the weather, at all times, for the safety of the vessel and its crew. The Mooring Master will provide the Master with an up-to-date weather forecast, upon boarding, to aid the Master. Concerns about the current or forecasted weather conditions should be discussed with the Mooring Master.

33 CFR §148.105(q) Floating Components

§148.105(q)(1) Floating and Offshore Components Descriptions and Drawings

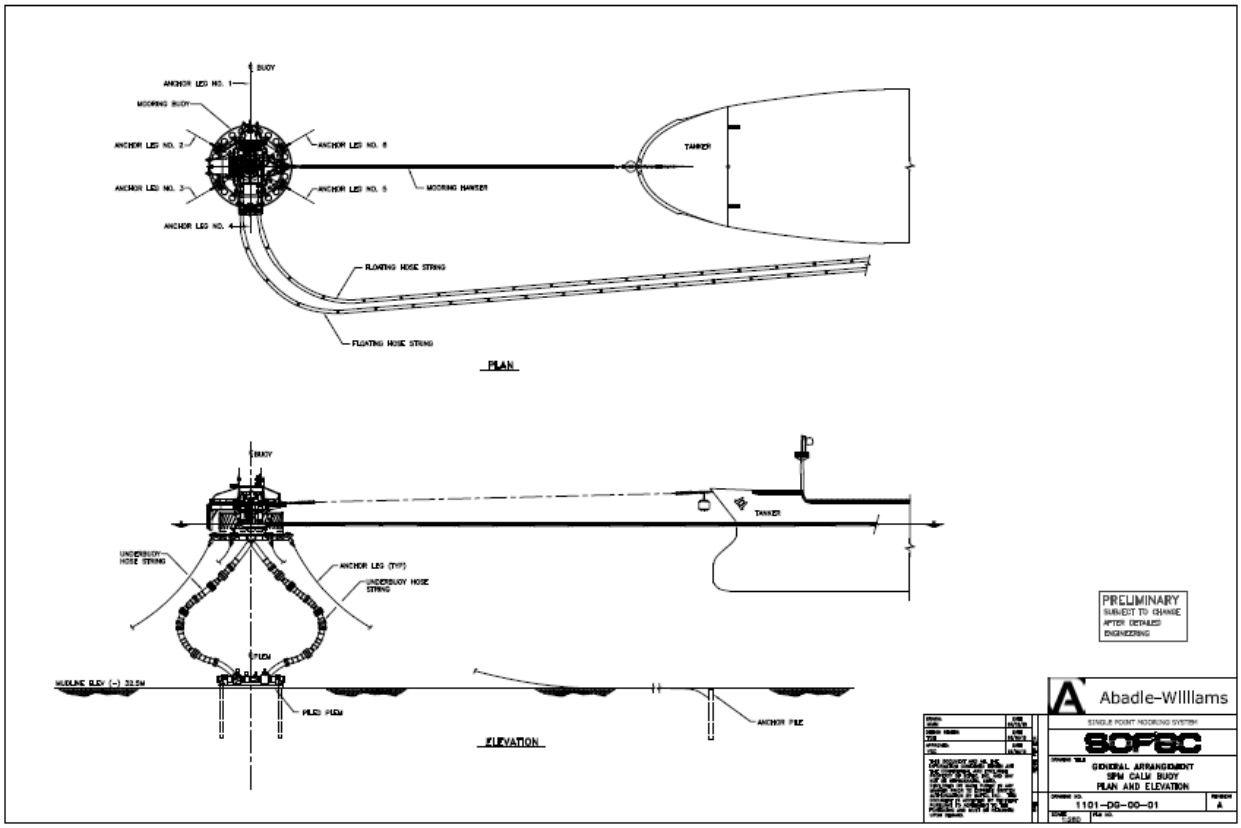
A description and preliminary design drawing of each floating component, including the hoses, anchoring or securing structure, and navigation lights if the component is a mooring buoy.

The Offshore floating components associated with the TGL project include two (2) SPM CALM type mooring buoys with associated subsea (under-buoy) marine hoses and floating marine hoses for the mooring of VLCCs and other smaller crude carrying vessel including Panamax, Suezmax, and AFRAmax. The deadweight tons of the vessels range from 80,000 DWT to 320,000 DWT. The water depth at both SPMs is 104 feet.

A Single Point Mooring (SPM) is an offshore mooring point used to facilitate Tankers loading or discharging various forms of liquid product cargo near onshore storage or production fields.

There are various types and configurations of SPMs for use in various locations and purposes, such as Turret Buoys, Single Anchor Leg Mooring (SALM), Single Point Mooring Towers, Spars, and Articulated Platforms. TGL is proposing to use a SPM Catenary Anchor Leg Mooring (CALM).

Figure 15. SPM Catenary Anchor Leg Mooring (CALM)

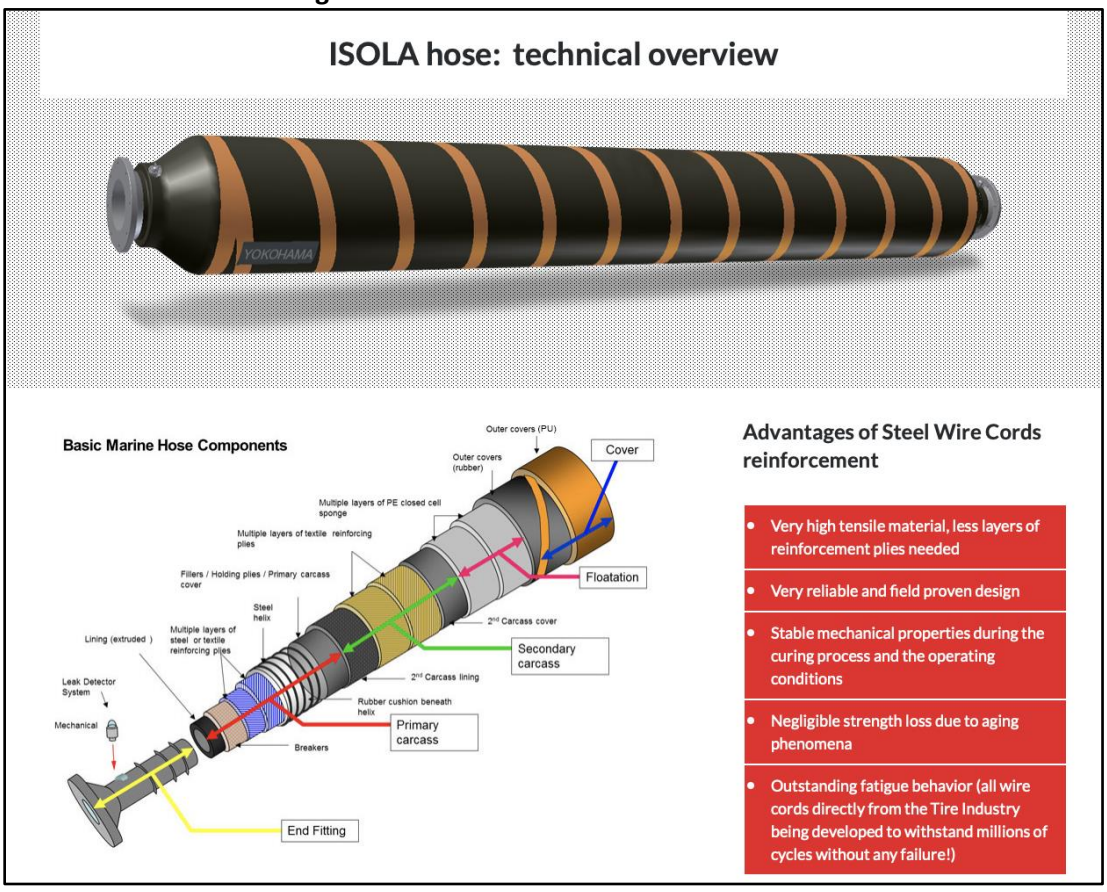


Both SPM buoys proposed configuration is a symmetric 6 leg mooring arrangement, with each terminated with driven anchor piles. The buoys will be classed by American Bureau of Shipping or other approved class. See Volume II, Appendix F, ABS Rules for Building and Classing Single Point Moorings, January 2019.

The SPM CALM will have two (2) 24 inch inside diameter Subsea (under buoy) marine hoses connecting the CALM fluid swivel to the Pipeline End Manifold (PLEM). The subsea marine hoses will be arranged in

a Chinese Lantern configuration. The floating hose section from the SPM fluid swivel to the vessel's center to bow manifold (CBM) consist of 1100 ft. of two (2) parallel 24 in. inside diameter floating marine hose with an additional 110 ft. 16 in. inside diameter rail tail marine hose. All hoses will be rated for 275 psig and will be double carcass type hoses. Each floating hose string will have a blank flange and a shutoff valve at the vessel's manifold end. The floating marine hoses strings and the subsea under buoy hose strings will incorporate a marine breakaway coupling per the SPM manufacture's recommendation.

Figure 16. ISOLA Hose: Technical Overview



There are two (2) proposed service mooring buoys. These will be used by the DWP support boats while they are on stand-by. The service buoys will be located in the vicinity of the manned platform. Each service vessel mooring buoy would be equipped with navigational lights, radar reflectors, and reflective tape. The buoys would be anchored to the seabed. The anchor system will be designed such that under maximum load conditions the force at the anchor remains horizontal, even in extreme environmental conditions, in order to provide the maximum holding capacity of the anchor. Two (2) support boats may tandem moor on a single buoy.

§148.105(q)(2) Floating Offshore Components Design Criteria

The criteria, developed under part 149 of this chapter, to which each floating component will be designed and built.

Each single point mooring and its attached hose must be designed for the protection of the environment and for durability under combined wind, wave, and current forces of the most severe storm that can be expected to occur at the port in any 100-year period. See §148.105(p)(2), Weather Summary.

The appropriateness of a design may be shown by its compliance with standards generally used within the offshore industry that are at least equivalent, in protecting the environment, to the standards in use on January 1, 2003, by any recognized classification society as defined in 46 CFR §8.100. *Recognized Classification Society* means the American Bureau of Shipping (ABS) or other classification society recognized by the Commandant under this part. See Volume II, Appendix F, ABS Rules for Building and Classing Single Point Moorings, January 2019.

Both SPM CALM systems will be designed for a maximum flow rate of 85,000 barrels per hour and provide safe mooring for tankers in sea states specified in Volume IV, Appendix D, TGL Operations Manual [**Confidential**]. The SPM CALM Buoy and PLEM will have a design life of thirty (30) years. The design life is based on a detailed SPM CALM Buoy, PLEM, Hawser and Hose maintenance and inspection protocol that will be developed per the manufacturer's recommendations.

§148.105(q)(3) Floating Offshore Components Design Standards and Codes

The design standards and codes to be used.

The following are the design standards and codes that will be used for the proposed TGL floating components.

Floating Components Industry Design Standards:

The applicable references to ABS publications and industry standards are listed below:

- **Buoyancy Tanks:** ASME Boiler and Pressure Vessel Code
- **Chain: ABS Guide for the Certification of Offshore Mooring Chain:** These requirements apply to the materials, design, manufacture, and testing of offshore mooring chain and accessories intended to be used for temporary and permanent applications such as: mooring of mobile offshore units, mooring of floating production units, mooring of offshore loading systems, and mooring of gravity based structures during fabrication.
- **Fiber Rope: ABS Guidance Notes on the Application of Fiber Rope for Offshore Mooring:** Guidance Notes is to describe criteria for design, material, testing, manufacturing, installation and subsequent survey of fiber ropes to be used as mooring components in offshore mooring systems. The secondary purpose of these Guidance Notes is to highlight differences between fiber rope mooring systems and typical steel mooring systems, and to provide guidance on how to handle these differences during system design and installation.
- **Wire Ropes: API Spec 9A and RP 9B**
- **API RP 2I, In-Service Inspection of Mooring Hardware for Floating Structures;** Third Edition, April 2008
- **API RP 2SK, Design and Analysis of Station Keeping Systems for Floating Structures,** Third Edition, October 2005, Addendum, May 2008, Reaffirmed June 2015
- **API RP 2SM, Recommended Practice for Design, Manufacture, Installation, and Maintenance of Synthetic Fiber Ropes for Offshore Mooring,** First Edition, March 2001, Addendum, May 2007
- **API RP 2FPS, RP for Planning, Designing, and Constructing Floating Production Systems;** First Edition, March 2001
- **Flexible Pipe: API RP 17B Recommended Practice for Flexible Pipe:** Provides guidelines for the design, analysis, manufacture, testing, installation, and operation of flexible pipes and flexible pipe systems for onshore, subsea, and marine applications.
- **Cargo or product piping installed on PLEM and SPM CALM is to comply with ASME/ANSI B31.4:** prescribes requirements for the design, materials, construction, assembly, inspection, testing,

operation, and maintenance of liquid pipeline systems between production fields or facilities, tank farms, above- or belowground storage facilities, natural gas processing plants, refineries, pump stations, ammonia plants, terminals (marine, rail, and truck), and other delivery and receiving points, as well as pipelines transporting liquids within pump stations, tank farms, and terminals associated with liquid pipeline systems.

- **ASME/ANSI B16.34 - 2004, Valves—Flanged, Threaded, and Welding End:** This standard applies to new valve construction and covers pressure-temperature ratings, dimensions, tolerances, materials, nondestructive examination requirements, testing, and marking for cast, forged, and fabricated flanged, threaded, and welding end, and wafer or flange-less valves of steel, nickel-base alloys, and other alloys shown in Table 1. Wafer or flange-less valves, bolted or through-bolt types, that are installed between flanges or against a flange shall be treated as flanged end valves.
- **ASME/ANSI B16.5, Steel Pipe Flanges and Flanged Fittings**: The ASME B16.5 - 1996 Pipe Flanges and Flange Fittings standard covers pressure-temperature ratings, materials, dimensions, tolerances, marking, testing, and methods of designating openings for pipe flanges and flanged fittings. The standard includes flanges with rating class designations 150, 300, 400, 600, 900, 1500, and 2500 in sizes NPS 1/2 through NPS 24, with requirements given in both metric and U.S units. The Standard is limited to flanges and flanged fittings made from cast or forged materials, and blind flanges and certain reducing flanges made from cast, forged, or plate materials. Also included in this Standard are requirements and recommendations regarding flange bolting, flange gaskets, and flange joints.
- **ASME V31.**4, **Pipeline Transportation Systems for Liquids and Slurries**: ASME B31.4 prescribes requirements for the design, materials, construction, assembly, inspection, testing, operation, and maintenance of liquid pipeline systems between production fields or facilities, tank farms, above- or belowground storage facilities, natural gas processing plants, refineries, pump stations, ammonia plants, terminals (marine, rail, and truck), and other delivery and receiving points, as well as pipelines transporting liquids within pump stations, tank farms, and terminals associated with liquid pipeline systems.
- **ASME BPVC** Pressure Vessel Code Section VIII - Rules for Construction of Pressure Vessels
- **American Welding Society AWS D1.1:** Structural Welding
- **ASME 77-DE-39** Design Criteria to Prevent Core Crushing Failure in Large Case-Hardened Ball and Roller Bearings
- **NACE MR 01 75/ ISO 1515:** Materials used in cargo or product transfer systems that will be exposed to hydrogen sulfide are to be selected within appropriate limits of chemical composition, heat treatment and hardness to resist sulfide stress cracking. Material selection is to comply with the requirements of NACE MR 01 75/ ISO 15156. Material selection is to consider the possibility of chloride stress cracking if chlorides are present in the cargo or product fluid.
- **NACE RP 01:** Corrosion Control on Steel, Fixed Offshore Platforms Associated with Petroleum Production.
- **Oil Companies International Marine Forum (OCIMF)**
- **OCIMF** Guidelines for the Purchasing and Testing of SPM Hawsers.
- **OCIMF** Single Point Mooring Maintenance and Operations Guide
- **OCIMF** Recommendations for Equipment in the Bow Mooring or Conventional Tankers at Single Point Moorings
- **GMPHOM 2009:** All marine hoses are to comply with the OCIMF Guide to Manufacturing and Purchasing Hoses for Offshore Moorings (GMPHOM 2009) and is to be manufactured to ABS Survey and Inspection. Each length of hose will to be subjected to hydrostatic and vacuum tests in accordance with requirements of 1.11.6 and 1.11.8, respectively, of the OCIMF Guide to

Manufacturing and Purchasing Hoses for Offshore Moorings. OCIMF GUIDE 5th Edition - GMPHOM 2009.

- **AFBMA Codes Swivel Bearings**: Swivel bearings that do not carry the hawser load are to be designed in accordance with AFBMA Codes (Anti Friction Bearing Manufacturers Association). Load Ratings and Fatigue Life for Roller Bearings.
- **ANSI/AFBMA Std 11** Load Ratings and Fatigue Life for Roller Bearings
- **NFPA 70, Electrical: National Electric Code**
- **API RP 500B** Recommended Practice for Classification of Locations for Electrical Installation at Drilling Rigs and Production Facilities on Land and Marine Fixed and Mobile Platforms
- **API RP 505:** Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Zone 0, Zone 1, and Zone 2
- **International Association of Marine Aids to Navigation and Light House Authorities (IALA) O-139:** Marking of Man-man Offshore Structures
- **IEC International Electrical Commission**

    - **IEC 60079** Electrical apparatus for Explosive gas Atmosphere
    - **IEC 60529** Specification of degrees of protection provided by enclosures
    - **IEC 60092** Electrical installation in ships
    - **IEC 60331** Tests on electrical cables under fire conditions
    - **IEC 61131** Programmable controller
    - **IEC 61215** Crystalline silicon terrestrial photovoltaic (PV) modules – Design qualification and type approval
    - **IEC 61508** Functional safety of Electrical / Electronic / Programmable Electronic Safety Related System
    - **IEC 61511** Functional safety - Safety instrumented systems for the process industry sector

- **International Organization for Standards (ISO)**
- **ISO 76:** Roller Bearings – static load ratings
- **ISO 281** Roller Bearings – dynamic load ratings and rating life

§148.105(q)(4) Floating Offshore Components Engineering Practices

The title of each recommended engineering practice that will be applied.

Engineering design and procurement will be undertaken in strict adherence to a certified ISO 9000 Quality Assurance Manual and its associated 'Standard Operating Procedures (SOPs). The work will conform to the requirements of industry established codes and standards as listed in Section 18.3 §148.105(q)(3). The ABS (or other approved body) will be engaged to provide for Classification of the completed assembly. This will include design review, component classification, and construction survey. Other engineering practices will be referenced as appropriate, including but not limited to those listed below for the floating components associated with the proposed SPM Buoy Systems: Oil Companies International Marine Forum, including:

- Guide to the Maintenance and Operation of SPM
- Guide to Manufacturing and Purchasing Hoses for Offshore Moorings (GMPHOM 2009)
- Buoy Mooring Forum Hose Guide for the Handling, Storage, Inspection and Testing of Hoses in the Field

- Guide to Purchasing Hawsers

National Society of Corrosion Engineers, including:

- SP 0177-2014 Standard Recommended Practice- Mitigation of Alternating Current and Lighting Effects on steel Structures and Corrosion Control Systems
- SP 0394-2013 Standard Recommended Practice- Application, Performance and Quality Control of Plant Applied Fusion-Bonded Epoxy External Pipe Coating
- SP 0490 Holiday Detection of Fusion-Bonded Epoxy External Pipeline Coating of 250 to 760 µm (10 to 30 mils)
- SP 0169-2013 Control of External Corrosion on Underground or Submerged Piping Systems NFPA Bulletins
- 77 Recommended Practice on Static Electricity

See Volume IV, Appendix E for Vendor Examples of SPM Design [**Confidential**].

§148.105(q)(5) Safety, Firefighting, and Pollution Prevention Equipment

A description of safety, fire-fighting, and pollution prevention equipment to be used on each floating component.

Safety:

Navigation Aids:

Obstruction Lights SPM CALM: At a minimum one 360-degree white light visible for five (5) miles under an atmospheric transmissivity of 0.85, flashing six (6) times per minute, and arranged for operation at least from sunset to sunrise, local time. The light is proposed to be located at a minimum of 10 ft. above the mean high-water mark per 33 CFR §149.540.

The hose strings will be marked at each end with a light on the pick-up float, flashing yellow, 50-70 times per minute, visible all around the horizon for 2 miles, 1 meter above the water.

Five (5) Privately Maintained Navigational Spar Buoys will be provided to define the limits of the proposed Safety Zone. The Buoys will have radar reflectors, day marks, lights FL 6s G or R, 15ft height. Buoy 1 will have a horn sound signal with a range of .5 nm.

Fog Signal: Audible fog signals are to be provided if prescribed by the National Authority having jurisdiction.

Radar Reflector: A radar reflector is to be provided if prescribed by the National Authority having jurisdiction.

Hand rails and ladders will be provided for personnel safety where needed.

Fire Fighting Equipment:

Both SPMs will be equipped with at least one B-II type portable fire extinguisher. Where the risk of an electrical fire also exists, one C-II type portable extinguisher is also to be provided. In lieu of providing two (2) extinguishers, consideration will be given to a single extinguisher of a type suitable for both oil and electrical fires. A B-II rated portable extinguisher could be 9-liter (2.5 U.S.

gallons) foam, 5 kg (11 lb.) carbon dioxide, or 5 kg (11 lb.) dry chemical. A C-II rated portable extinguisher could be 5 kg (11 lb.) carbon dioxide or 5 kg (11 lb.) dry chemical.

The DWP escort tug will also have fire monitors on board for firefighting.

Pollution prevention equipment:

The Texas Gulf Link Deepwater Port Offshore Facility will have automated as well as manually operated pressure relief valves installed in the oil transfer system that will prevent the system from over pressurizing. The relief valve system will divert oil and pressure into the surge relief tank located on the platform**.** The proposed floating marine hoses and under buoy hoses will incorporate marine breakaway couplings. Marine breakaway couplings provide two (2) distinct environmental safety features. The first is to shut-off flow in the event of an overpressure situation and the second is to allow marine hose separation and fluid isolation in the unlikely event that a vessel loses its mooring. This will minimize the risk of damage and spillage. The SPMs will have manual and hydraulically-operated valves for isolation. The Texas GulfLink Deepwater Port support boats will have oil spill response equipment to immediately respond to an oil spill incident within the port. The escort tug will have offshore boom on reels, offshore oil skimmers, absorbent pads on board, and oily water holding tank(s).

§148.105(q)(6) Lighting on Floating Hoses for Night Detection

A description of lighting that will be used on floating hoses, for night detection.

HOSE STRING LIGHTING

The hose strings will be marked at each end with a light on the pick-up float, flashing yellow, 50-70 times per minute, visible all around the horizon for 2 miles, 1 meter above the water. The SPM lighting will define one end of the hose string and the hose end float light will mark the opposite end allowing the profile of the hose on the water to be determined.

CALM BUOY LIGHTING

Obstruction lights will be fitted on the CALM mooring buoy as per 33CFR§149.540 and located at 15 ft above mean high water with a range of 4nm in 106 ft of water. FL Q W.

References:

Offshore Technology: The Dawn of offshore Mega-Terminals 19 November 2018

Figure 17. Complete Depiction of and SPM CALM Buoy System with Moored Tanker

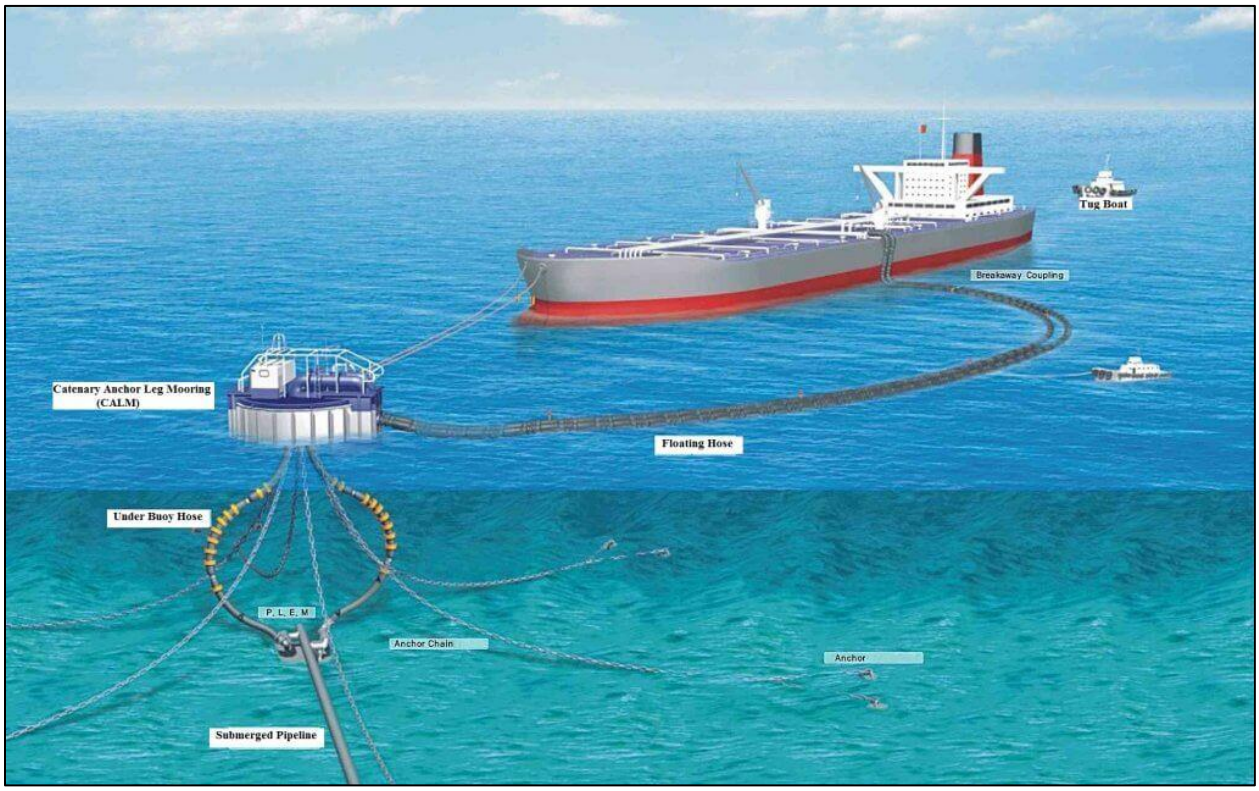


Figure 18. Above-water Depiction of a Tanker Moored at a SPM CALM Buoy

Figure 19. Crude Oil Loading Flow Path

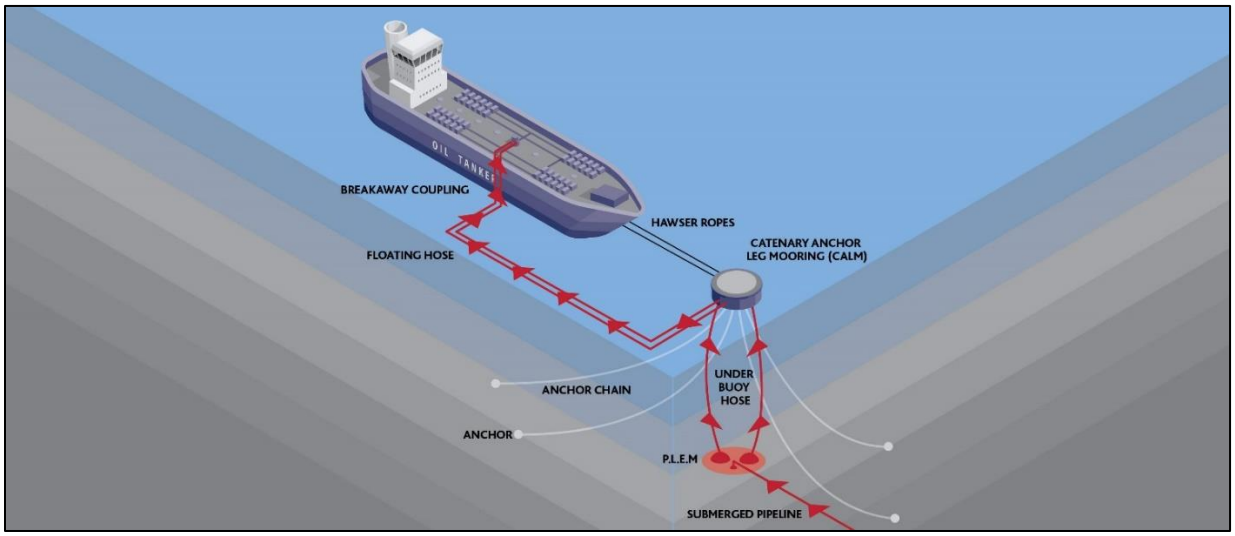


Figure 20. Underbuoy Marine Breakaway Couplings

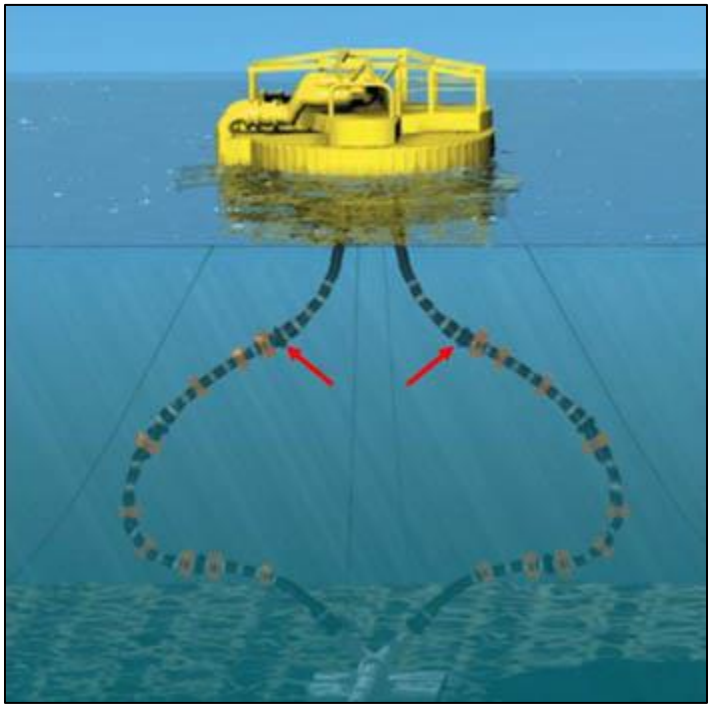
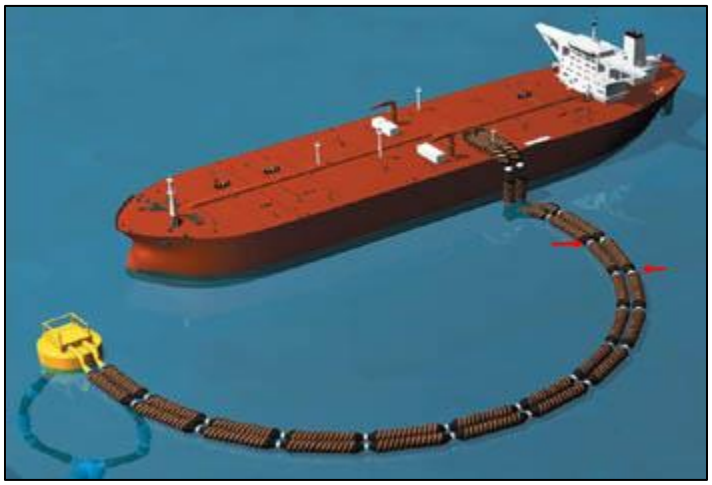


Figure 21. Floating Hose Marine Breakaway Couplings



33 CFR §148.105(r) Fixed Offshore Components

§148.105(r)(1) Offshore Drawings

A description and preliminary design drawing for each dedicated fixed offshore component.

The Texas GulfLink offshore marine terminal will consist of a fixed offshore two-platform complex. Each platform will be a 4-pile fixed structure, with both structures connected by a personnel/utility bridgeway.

One platform will be dedicated as the Living Quarters platform. This platform will include the radar control room, manned living quarters, helideck, jib crane, rescue boat, and life boat.

One Platform will be dedicated as the Metering Platform. This platform will include incoming and outgoing 42'' pipeline risers, 48'' pig receiver, custody transfer meters, sampling, surge relief system for pipeline protection, hydraulic crane, communication tower, and various piping and valving.

Figure 22. Isometric View of the Texas GulfLink Offshore Platform Complex

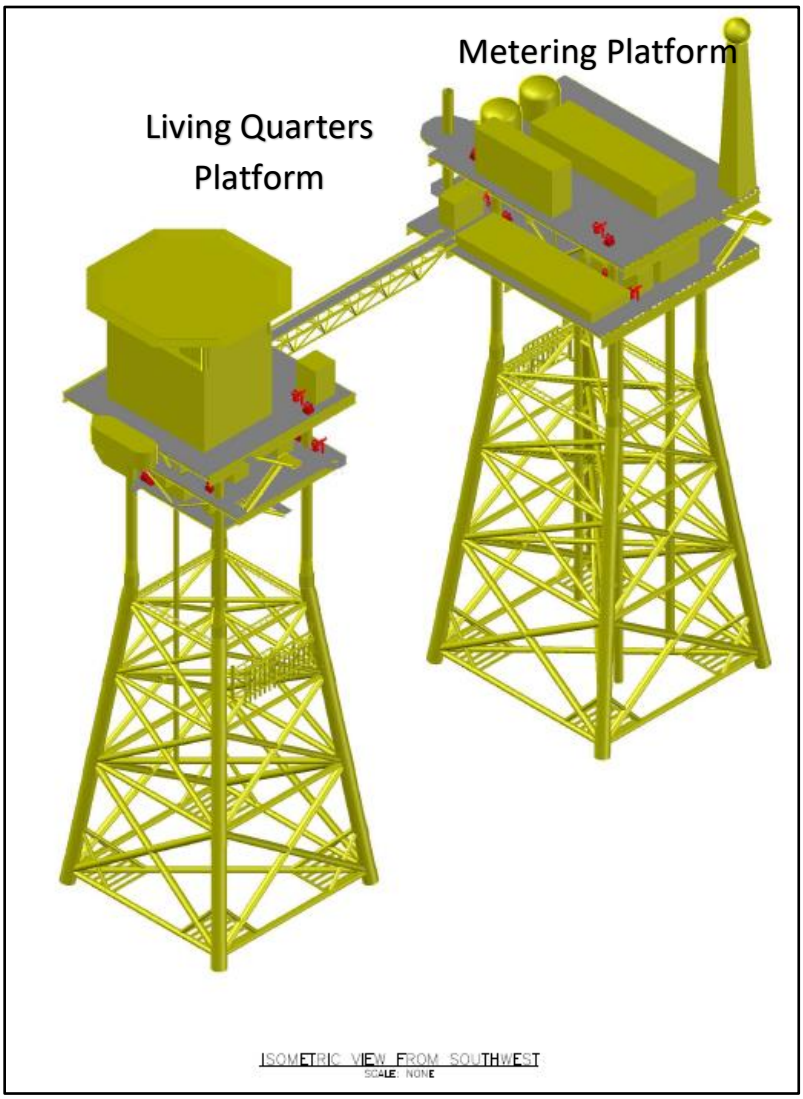
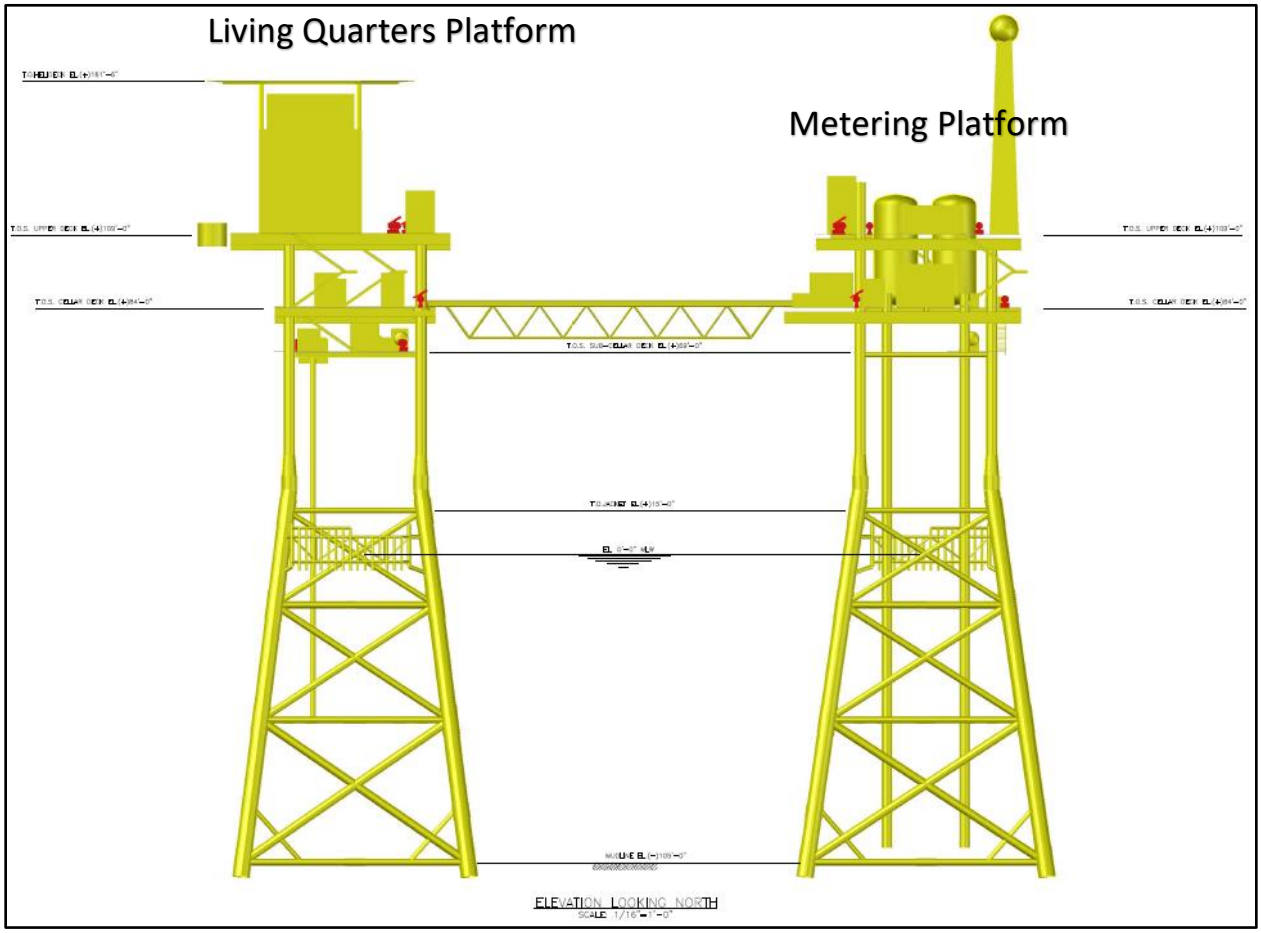


Figure 23. Side View of the Texas GulfLink Offshore Platform Complex



The following equipment will be located on each deck of the Metering and Living Quarter Platforms.

Table 7. Proposed Offshore Equipment List

TEXAS GULFLINK PROJECT						
Proposed Offshore Platform Equipment List (2) 4-Piles						
			SIZE			
Platform	**EQUIPMENT**	**LOCATION**	**L(ft**	**W(ft**	**H(ft**	**DESCRIPTION**
Meter	Pig Receiver	Upper	65	20	10	42" P/L from Terminal
Meter	Crane	Upper	20 ft Tail Swing			50 ST 125 ft Boom
Meter	Temporary	Upper	40	10	10	Two Stacked
Meter	Radar	Upper	10	10	70	Array mounted on 70 ft
Meter	Meter	Cellar	70	20	5	30" Meters
Meter	Sample	Cellar	3	6	5	
Meter	Surge	Cellar	6	3	5	
Meter	Surge Tank	Cellar		15	30	Two Vertical
Meter	Surge Tank	Cellar	8	5	4	Electric (100% Backup)
Meter	Sample Tank	Cellar	4	4	6	36" OD Tank
Meter	Laboratory	Cellar	8	8	10	
Meter	MCC Room	Cellar	20	8	12	Below VTC Room
Meter	Sump	Sub-Cellar	15	5 OD	7	With Coalescing Plate Pack
Meter	SW HR	All	3	2	3	6 Units 2 per Deck
Meter and Quarters	Fire Monitors	Upper/Cellar	3	3	4	4 Units 2 per Deck
Meter and Quarters	AFFF HR	All	3	2	4	12 Units 4 per Deck
Quarters	Diesel Fuel	Upper	10	10	15	14 Day Run Time Single
Quarters	Living	Upper	50	35	36	Three Floors
Quarters	Vessel	Upper	30	15	12	Roof Living Quarters below
Quarters	Helideck	Upper	60	60	8	Above Living Quarters
Quarters	Freshwater	Upper		10	10	Roof Living Quarters below
Quarters	Freshwater	Upper		4 OD	8	Roof Living Quarters below
Quarters	Freshwater	Upper	3	2	3	Roof Living Quarters below
Quarters	HVAC Units	Upper	10	5	5	Roof Living Quarters below
Quarters	Life Boat	Upper	30	10	8	Davit Lowered
Quarters	Davit Crane	Cellar				Retrieval Lifesaving Vessel
Quarters	Jib Crane	Cellar				Quarters Supplies
Quarters	Generators	Cellar	15	8	10	Two Diesel (100% Backup)
Quarters	Transfer	Cellar	2	2	5	Wall Mounted in MCC Room
Quarters	Storage	Cellar	20	8	12	
Quarters	Inert Gas	Sub-Cellar	8	6	5	
Quarters	Air	Sub-Cellar	15	10	10	Vertical Receiver 48" OD 6 ft
Quarters	Fire Fighting	Sub-Cellar	8	15	10	Diesel Pump

Quarters	Rescue Boat	Sub-Cellar	25	10	9	Launch and Recovery Davit
Quarters	Sewage Unit	Sub-Cellar	4	8	6	
Quarters	Freshwater	Sub-Cellar	6	5	8	Pump with 48" OD x 7ft Tank

Below are the General Arrangement drawings of each Platform Deck.

Figure 24. Upper Deck

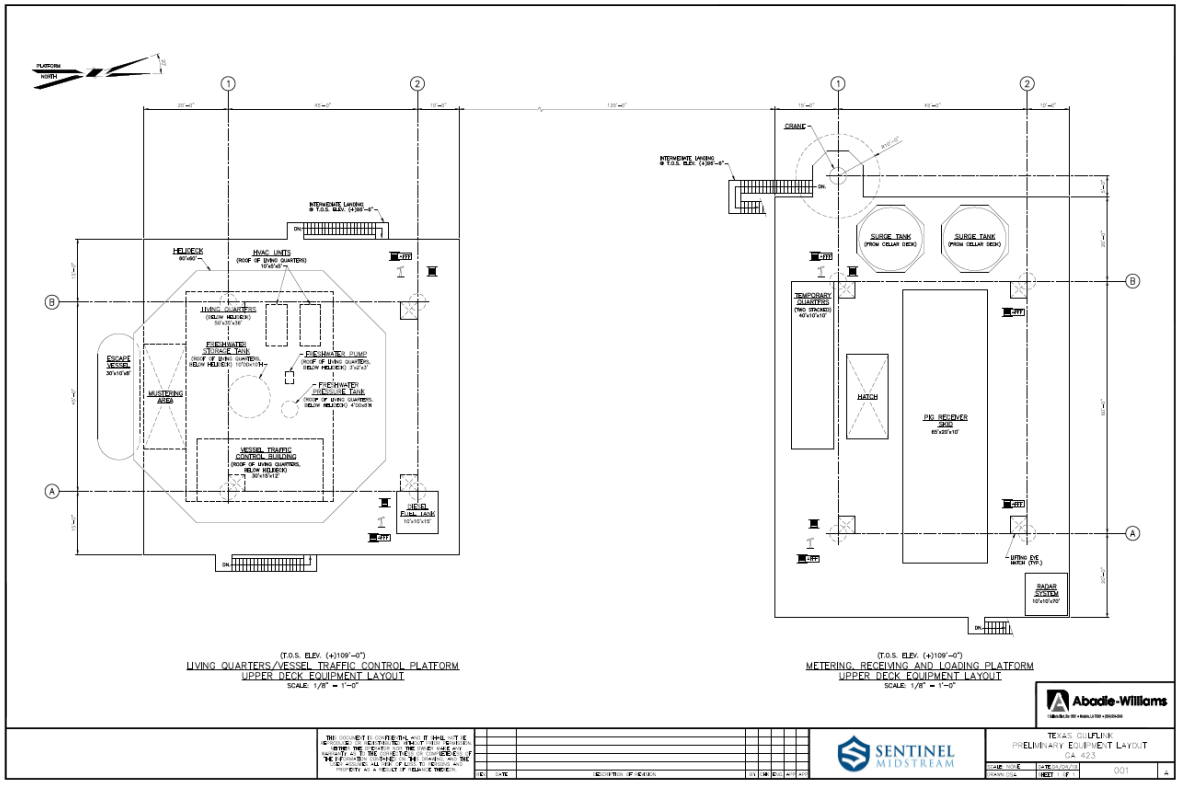


Figure. 25 Cellar Deck

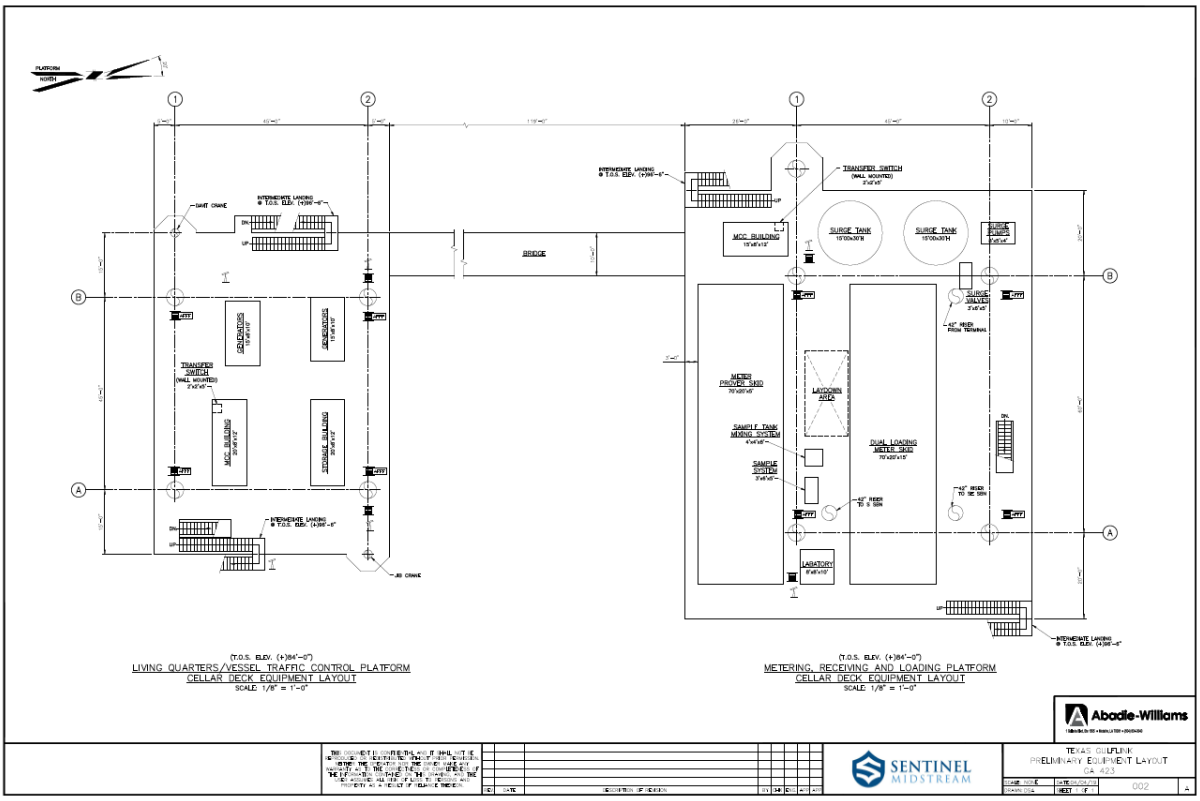


Figure 26. Sub-cellar Deck

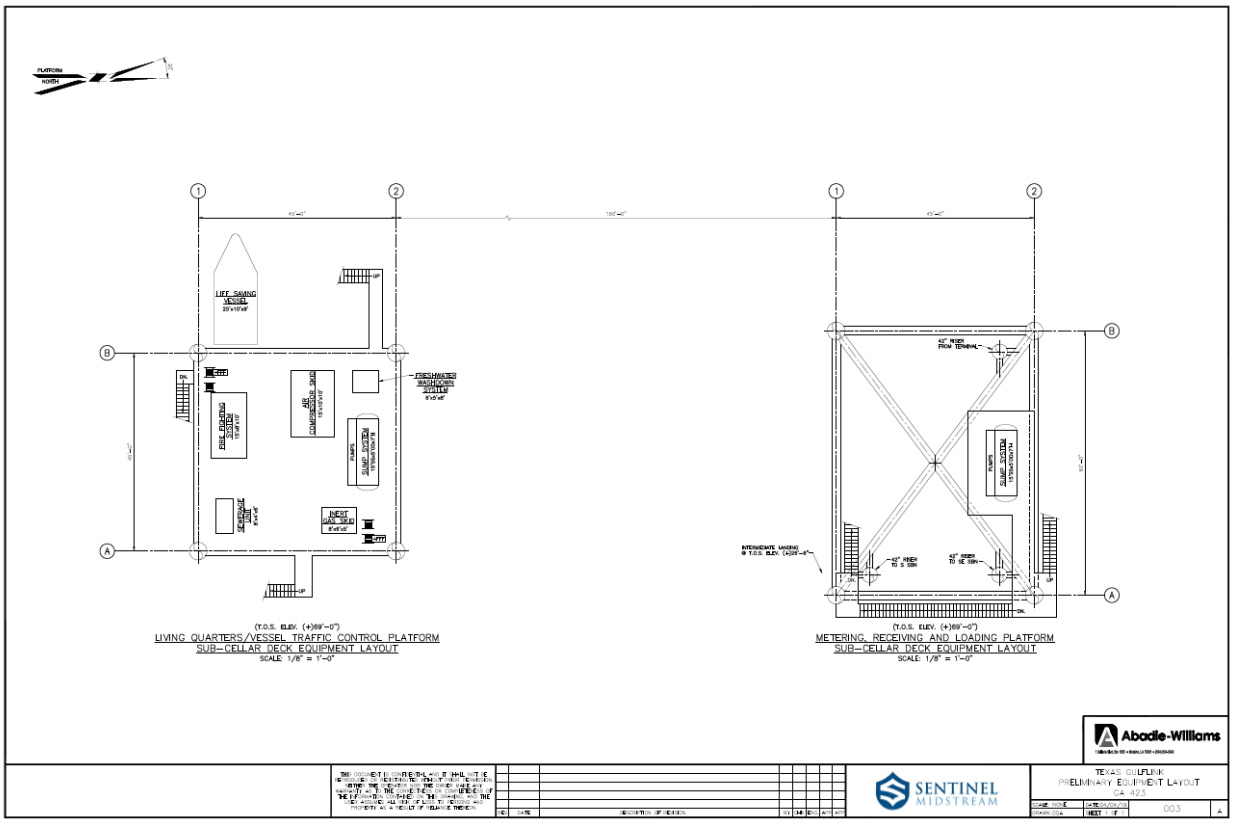
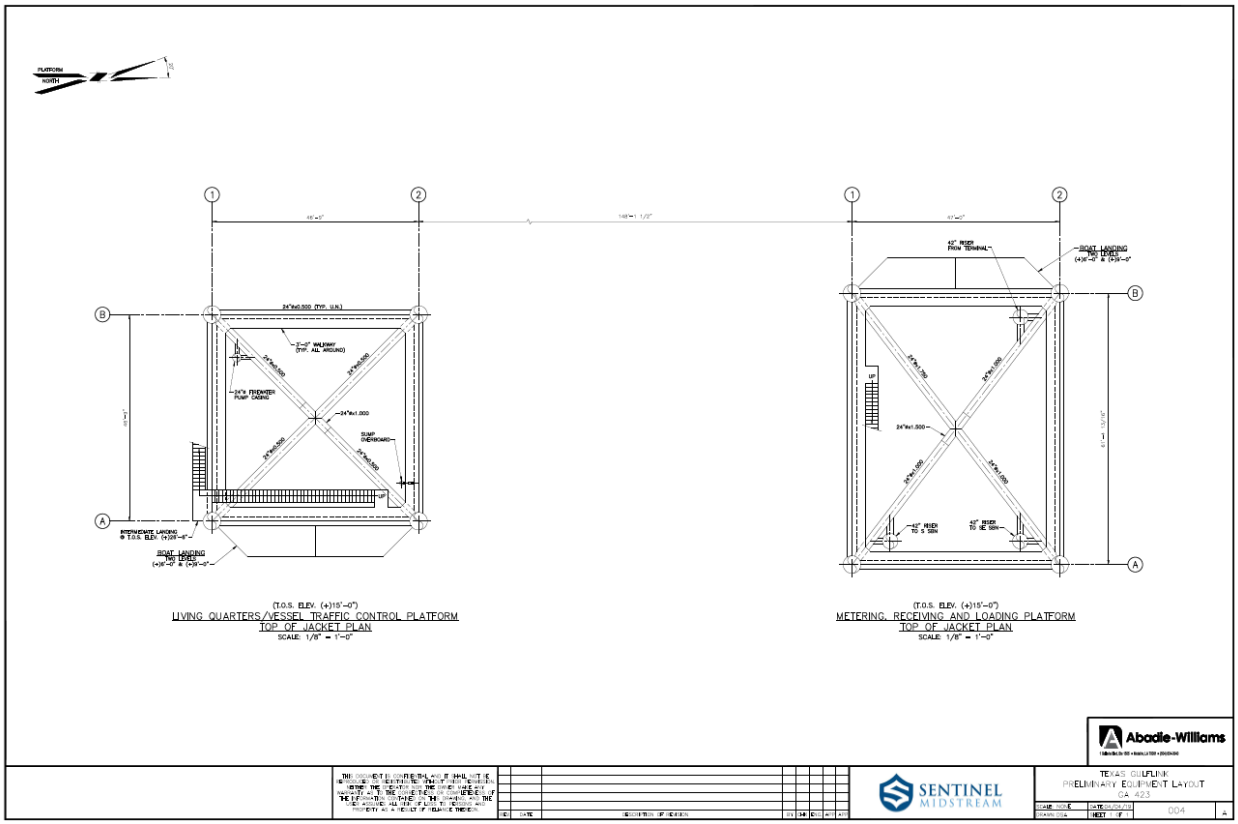


Figure 27. Top of Jacket Plan



§148.105(r)(2) Design Criteria

The design criteria, developed under part 149 of this chapter, to which each fixed offshore component will be designed and built.

For details on the Proposed Platform Structural Analysis Report, see Volume IV, Appendix F, Galveston Bay Area TGL Design Basis (2) 4-Pile Platform [**Confidential**].

Platform Location

Texas GulfLink will have two (2) 4-pile platforms connected by a personnel/utility bridgeway. The platforms are to be located in Block 423, Galveston Area, 28.3 nautical miles from the Brazoria County coastal crossing, 1.3 statuary miles West from the Brazos River Delta.

Platform Classification

The proposed classification of each platform is L-1 Manned-Evacuated High Consequence.

Water Depth

The proposed Platform Complex is in approximately 104 ft. of water - Mean Low Water.

Platform Life

The proposed platform design life expectancy is 30 years.

Platform Type

Both the Living Quarters Platform and the Metering Platform are 4-pile, X-braced, fixed template type structures.

Platform Function

The Metering Platform will support three 42" Ø risers, one (1) 48'' pipeline receiver, surge relief system, custody transfer metering, sampling, crane, piping, valves, and boat landing. The Living Quarters Platform will support a radar control room, emergency equipment, jib crane, living quarters, boat landing, and helideck.

Environmental Data

Environmental data can be found in Volume IV, Appendix F, Galveston Bay Area TGL Design Basis (2) 4-Pile Platform [**Confidential**].

Geotechnical Data

Environmental data can be found in Volume IV, Appendix B, Soil Data [**Confidential**].

Corrosion Protection

Atmospheric Zone – Coating System

To be determined

Splash Zone – SplashTRON or equivalent

To be determined

Submerged Zone – Cathodic protection with sacrificial anodes with a design life of 30 years.

Deck Sizes & Elevations

Table 13. Deck Sizes & Elevations

4-Pile Living Quarters Platform	Size	Elevation
Main Deck	75' x 75' grated	(+) 109'-0" top of steel
Cellar Deck	55' x 75' grated	(+) 84'-0" top of steel
Sub-Cellar Deck	45' x 45' grated	(+) 69'-0' top of steel
4-Pile Metering Platform	**Size**	**Elevation**
Main Deck	70' x 100' grated	(+) 109'-0" top of steel
Cellar Deck	80' x 100' grated	(+) 84'-0" top of steel
Sub-Cellar Deck	15' x 20' grated	(+) 69'-0' top of steel

Number of Piles and Batter

Four 60" Ø main piles

Work Point Elevation: (+) 22'-0"

Leg batters: 1/10 along long sides, 1/7 along narrow side (Metering Platform)

Leg Batter: 1/8 (Living Quarters Platform)

Boat Loading and Barge Bumpers

Two boat landing on Row A (southwest side Living Quarters Platform) and Row B (northeast side Metering Platform).

Crane

50 Ton Platform (Metering Platform)

Jib and Davit (Living Quarters Platform)

Risers & pump Casings

3 – risers – 42" diameter (Metering Platform)
20" and 8" pump casings overboard sump line (Living Quarters Platform)

Load Summary

Storm Loads:

100 Year Hurricane Season Storm wind, tide, current, and wave characteristics as defined in API RP 2MET.

Uniform Live Load:

Main Deck:	Live Load	300 psf
Cellar Deck:	Live Load	300 psf
Sub-Cellar deck:	Live Load	150 f

Design Loading Combinations

The structure will be designed for the following in-place and installation conditions:

1. 30-year environmental storm conditions with 300 psf deck main deck, cellar deck, 150 psf subcellar deck loads applied at 75%– UR approach0.85
2. Operational storm conditions with 300 psf deck main deck, cellar deck, 150 psf subcellar deck loads applied at 75%
3. Loadout – with forced 2" deflection at onesupport
4. Tow
5. Lift
6. On-bottom Stability

Table 14. Loading Combination Matrix

Load/Combinations / Design Conditions	1	2	3	4	5	6
Jacket Dead Load	1.00	1.00	1.00	1.00	2.00/ 1.35	1.00
Deck Dead Load	1.00	1.00	1.00	1.00	2.00/ 1.35	
Main Deck PSF Loading (300 pdf)	0.75	0.75				
Cellar Deck PSF (300 pdf)	0.75	0.75				
50 Year Storm (Wave, Current, Wind)	0.75	0.75				
Operational Storm (Wave, current & wind)		1.00				
Tow Storm				1.00		
Installation Storm (10' max. wave)						1.00
Allowable Stress Factor	1.33	1.00	1.33	1.33	1.00	1.00

Storm wave loads will be applied to platform from eight directions. Operational wave loads will be applied to platform from eight directions. The structure will be analyzed with blanket uniform psf loading as equipment loading is minimal. Deck lift case will include actual equipment and piping only. For all analyses the density of steel will be increased by 5% to account for mill tolerances, etc. (except tow/installation where a 3% increase will be utilized.

§148.105(r)(3) Standards and Codes

The design standards and codes to be used.

The below codes and standards will be used for the proposed fixed offshore platforms.

Code of Federal Regulations (CFR)

- 33 CFR §149 Deepwater Ports: Design, Construction, and Equipment
- 49 CFR §195 Transportation of Hazardous Liquids by Pipeline

American Institute of Steel Construction (AISC)

- 325-11 Steel Construction Manual
- A.I.S.C. "Specification for the Design Fabrication and Erection of Structural Steel for Buildings", Ninth Edition

American Petroleum Institute (API)

- API RP 14C Analysis, Design, and Testing of Safety Systems for Offshore Production Facilities
- API Spec 5L Specification for Line Pipe
- API Spec 2B Specification for the Fabrication of Structural Steel Pipe

- API Spec. 2C, Specification for Offshore Pedestal Mounted Cranes, Sixth Edition, March 2004, Effective Date: September 2004
- API Spec 2H Specification for Fabricated Structural Steel Plate for Offshore Platform Tubulars
- API Spec 6D Specification for Pipeline Valves
- API Spec 12D Specification for Field-welded Tanks for Storage of Production Liquids
- API RP 14C Analysis, Design, and Testing of Safety Systems for Offshore Production Platforms
- API RP 14E Design and Installation of Offshore Production Platform Piping Systems
- API RP 14F Design, Installation, and Maintenance of Electrical Systems for Fixed and Floating Offshore Petroleum Facilities
- API RP 14 J Design and Hazards Analysis for Offshore Production Facilities
- API RP 500 Classification of Locations for Electrical Installation at Petroleum Facilities
- API RP 520 Sizing, Selection and Installation of Pressure Relieving Devices
- API RP 521 Pressure Relieving and Depressuring Systems
- API 650 Welded Steel Tanks for Oil Storage
- API STD 1104 Welding of Pipelines and Related Facilities
- API STD 521 Pressure Relieving and Depressuring Systems
- API RP 2EQ, 1st Edition, Seismic Design Procedures and Criteria for Offshore Structures
- API RP 2GEO, 1st Edition, Geotechnical and Foundation Design Considerations
- API RP 2MET Derivation of Metocean Design and Operating Conditions
- API Bulletin 2INT-DG, Interim Guidance for Design of Offshore Structures for Hurricane Conditions, May 2007
- API Bulletin 2INT-MET, Interim Guidance on Hurricane Conditions in the Gulf of Mexico, May 2007
- API RP 2SIM, 1st Edition, Structural Integrity Management of Fixed Offshore Structures
- API RP 2A-WSD Recommended Practice for Planning, Designing, and Constructing Offshore Platforms, Working Stress Design

American Society of Mechanical Engineers (ASME)

- ASME Boiler and Pressure Vessel Code, Section VIII, Div. I
- ASME B16.5 Pipe Flanges and Flanged Fittings, NPS ½ through NPS 24
- ASME B16.9 Factory-Made Wrought Steel Butt-Welding Fittings
- ASME B16.11 Forged Steel Fittings, Socket Welding, and Threaded
- ASME B16.20 Metallic Gaskets for Pipe Flanges
- ASME B31.4 Pipeline Transportation Systems for Liquids and Slurries

ASTM International (ASTM)

- ASTM B16.47 Large Diameter Steel Flanges NPS 26 through NPS 60
- ASTM A36 Standard Specification for Carbon Structural Steel
- ASTM A105 Forging, Carbon Steel for Piping Components
- ASTM A633 Normalized High-Strength Low-Alloy Structural Steel Plates
- ASTM A992 Structural Steel Shapes

American National Standards Institute (ANSI)

- ANSI B2.1 Pipe Threads
- ANSI B16.34 Valves – Flanged and Butt Weld End

National Association of Corrosion Engineers

- NACE Standard RP0176-2003, Standard Recommended Practice, Corrosion Control of Steel Fixed Offshore Structures Associated with Petroleum Production
- ANSI/AISC 360-05, Specification for Structural Steel Buildings

American Welding Society (AWS)

- AWS D1.1:2000, Structural Welding Code—Steel, 17th Edition, October 18, 1999

National Fire Protection Association (NFPA)

- NFPA 70 U.S. National Electric Code (NEC)
- NFPA 70E Standard for Electrical Safety in the Workplace

§148.105(r)(4) Practice Titles

The title of each recommended engineering practice to be followed.

See Volume IV, Appendix F, Galveston Bay Area TGL Design Basis (2) 4-Pile Platform [**Confidential**].

§148.105(r)(5) Additional Design Drawings

A description of the following equipment that will be installed: Navigational lighting; Safety equipment; Lifesaving equipment; Firefighting equipment; Pollution prevention equipment, excluding response equipment which must be outlined in the facility response plan; Waste treatment equipment;

(i) Platform Lighting and Identification

Obstruction Lights

Both of the Texas GulfLink platforms, in the platform complex, will be fitted with obstruction lights on each corner, each light to have a 360° lens, and all lights shall be operated to flash in unison.

- The lights will be visible at a distance of at least five nautical miles.
- The lights shall be displayed at 90 ft. above mean high water.
- The lights shall all be mounted on the same horizontal plane within the limitations of height specified in 33 CFR §67.20-5, §67.25-5, or §67.30-5, as applicable.
- All obstruction lights shall be installed in a manner which will permit at least one of them to be carried in sight of the mariner, regardless of the angle of approach, until the mariner is within 50 ft. of the structure, visibility permitting.
- All obstruction lights will be powered from a reliable power source, including auxiliary power sources. They shall display a white quick-flash characteristic of approximately 60 flashes per minute.
- Obstruction lights shall be displayed at all times between the hours of sunset and sunrise, local time, commencing at the time the construction of a structure is begun.
- During construction and until such time as a platform capable of supporting the obstruction lights is completed, the fixed lights on an attending vessel shall be used. In addition, when lights are in use for general illumination to facilitate the construction or operation of a structure, and can be seen from any angle of approach at a distance equal to that prescribed for the obstruction lights for the class of structure, the actual operation of obstruction lights also will not be required.

Rotating Beacons

In addition to obstruction lights, the metering and cargo platform will have a lit rotating beacon that distinguishes the deepwater port from other surrounding offshore structures as per 33 CFR §149.555. (additional specs will be provided)

- Have an effective intensity of at least 15,000 candela;
- Flash a white light at least once every 20 seconds;
- Operate in wind speeds of up to 100 knots at a rotation rate that is within 6 percent of the operating speed displayed on the beacon;
- Have one or more leveling indicators permanently attached to the light, each with an accuracy of ±0.25 ° or better; and
- Located: At least 60 ft. (about 18.3 meters) above mean high water, not obstructed in any direction, visible all around the horizon.

Platform Identification

Placards will be mounted on the platform to display the name of the deepwater port and the name or number identifying the structure, as per 33 CFR §149.570, so that the information is visible:

- From the water at all angles of approach to the structure.
- From aircraft on approach on the Helicopter Pad.
- At least 12 inches high, in vertical block style.
- Displayed against a contrasting background.

RADAR Beacon

An FCC-accepted RACON radar beacon (RACON) will be located on the metering and cargo platform as per 33 CFR §149.580

The RACON must transmit:

- In both 2900–3100 MHz and 9300– 9500 MHz frequency bands; or
- Transmit a signal of at least 250 milliwatts radiated power that is omni-directional and polarized in the horizontal plane;
- Transmit a two-element or more Morse code character, the length of which does not exceed 25 percent of the radar range expected to be used by vessels operating in the area;
- If of the frequency agile type, be programmed so that it will respond at least 40 percent of the time, but not more than 90 percent of the time, with a response-time duration of at least 24 seconds; and
- Will be located at a minimum height of 15 ft. above the highest deck of the platform and where the structure of the platform, or equipment mounted on the platform, does not obstruct the signal propagation in any direction.

Sound Signal

The Texas GulfLink platform complex will have a sound signal, approved under 33 CFR §67.10 of this chapter, that has a two-mile range as per 33 CFR §149.585.

- Located at least 10 feet, but not more than 150 feet, above mean high water, unobstructed
- Have its maximum intensity at a frequency between 100 and 1,100 Hertz;
- Sound a 2-second blast every 20 seconds (2 seconds sound, 18 seconds silence)
- Have the rated range required by §67.20-10, §67.25-10, or §67.30-10;
- Have a height not exceeding 25 feet;

- Have not more than eight sound sources;
- Approved by the Coast Guard under §67.10-15; and
- Be permanently marked with:
  (1) The date of Coast Guard approval;
  (2) The manufacturer and date of manufacture;
  (3) A model designation;
  (4) The approved range; and
  (5) The power necessary to comply with the provisions of paragraph (c) of this section.

The 33 CFR §67.10-10 operating requirements will be met as the Vessel Traffic Controller will be on duty 24-hours per day and be responsible for activating the signal whenever visibility is less than 5 nm in any direction and securing the signal when required.

Sound signal tests will be conducted as per 33 CFR §67.10-20 (Sound Signal Tests) in the presence of a Coast Guard representative, who certifies the test if the procedures comply with the requirements of this section. Texas GulfLink will follow the requirements of §67.10-25 when submitting an application for the sound tests.

(i) CALM Lighting

Obstruction Lights

Obstruction lights will be fitted on the CALM mooring buoy as per 33 CFR §149.540 and located at 15 ft above mean high water. Flash QW, 4nm Range

Identifying Placard

The SPM's will have identifying placards mounted to indicate the number of the SPM.

Hose String Lights

The hose strings will be marked at each end with a light on the pick-up float, flashing yellow, 50-70 times per minute, visible all around the horizon for 2 miles, 1 meter above the water.

Table 8. Proposed Buoy Locations

Description	Name	Depth	Latitude	Longitude	Characteristic	Height	Range	Structure	Remarks
Safety Zone Boundary	GulfLink Fairway Lighted Buoy 1	116 ft	28-29'41" N	094-56'59" W	Fl G 6s	12	75c	Pillar Green	Radar Reflector 2nm Private Aid HORN 0.5nm
	GulfLink Fairway Lighted Buoy 2	111 ft	28-31'42" N	094-56'54" W	Fl R 6s	12	75c	Pillar Red	Radar Reflector 2nm Private Aid
	GulfLink Fairway Lighted Buoy 3	113 ft	28-29'52" N	095-02'49" W	Fl G 6s	12	75c	Pillar Green	Radar Reflector 2nm Private Aid
	GulfLink Fairway Lighted Buoy 4	104 ft	28-43'11" N	094-57'56" W	Fl R 6s	12	75c	Pillar Red	Radar Reflector 2nm Private Aid

	GulfLink Fairway Lighted Buoy 5	104 ft	28-32'38" N	095-04'49" W	Fl G 6s	12	75c	Pillar Green	Radar Reflector 2nm Private Aid
SPM 1	GulfLink Lighted Mooring "TGL 1"	106 ft	28-32'33" N	095-00'27" W	Q W	15	5	yellow	Private Aid Placard "Texas GulfLink SPM 1"
SPM 2	GulfLink Lighted Mooring "TGL 2"	106 ft	28-31'54" N	095-01'45" W	Q W	15	5	Yellow	Private Aid Placard "Texas GulfLink SPM 2"
Hose String	SPM Hoses (4)				Q Y	4	2	Orange Float	Hose End Float 50-70 per min
Service Mooring Buoys	GulfLink Lighted Mooring Buoy SVC-1	103 ft	28-34'00" N	095-00'00" W	Fl W 4s	8		White	Radar Reflector Private Aid
	GulfLink Lighted Mooring Buoy SVC-2	103 ft	28-33'00" N	095-03'00" W	Fl W 4s	8		White	Radar Reflector Private Aid
Marine Terminal Platform	GulfLink Platform Complex	104 ft	28-33'09" N	095-01'42" W		165		on platform	RACON: G(–··) HORN 2s (20s)
	(8) Obstruction Lights				Q W 1s	90	5		Outboard Corners flash in Unison
	Rotating Beacon				Fl W 15s	165	15,000c		On Tower

(ii) Fire Fighting & Life Saving Equipment

The maximum number of persons on the platform complex will be 40 persons. The assigned complement of 20 persons plus an additional 20 temporary personnel. As per 33 CFR §149.305, the total capacity of survival craft will be at 60-persons, allowing for 150% of the total persons. Lifesaving requirements will be based on the 40-person capacity, including the 20 temporary personnel.

Means of Escape

Each Platform will have fixed steel ladders from the highest point down to the 15 ft level with boat landings provided with split levels and fendering to allow boats alongside. Manropes will also be fitted to permit swinging out onto the boats, if necessary. The walkway bridgeway connecting the two platforms will provide an alternate means of escape utilizing the primary escape route for the opposite platform.

Immersion suit

Each manned deepwater port located north of 32 degrees North latitude must comply with the immersion suit requirements in 46 CFR §108.580. Our location 28.3 degrees is not required to be provided with immersion suits.

Fire Detection System

A fire detection system divided into zones will be installed in the living quarters and Metering Platform OTS areas in compliance with 46 CFR §108.405, 29 CFR §1910.2 and 29 CFR §1910.7. The sleeping berthing spaces will also have smoke detectors fitted. The control panel for the fire detection system will be located in the Vessel Traffic Controller's Control Room which is manned 24-hours a day.

Fixed Fire Extinguishing System

The Platform Complex will be provided with an installed Fixed Fire Extinguishing system covering the Galley Ranges, Fryers and Diesel Generator Enclosures. The platform will not be fitted with a paint locker.

Fire Main System

A Fire Main System compiling with 46 CFR §108.415-.429, 29 CFR §1910.2 and 29 CFR §190.7 will at installed on the Platform Complex. The System will cover:

- Living Quarters Accommodation
- Temporary Accommodations Quarters (on Metering Platform)
- Control Rooms on Metering and/or Control Platforms
- Helicopter Deck
- 84ft level on both Platforms

Helicopter Landing Deck

The Helicopter Landing Deck will be provided with a fire hydrant and a 160-B Extinguisher at each stairway. A fire hydrant and hose will be located near each stairway. A fixed fire monitor will be provided that covers the helicopter landing area.

(iii) Life Boat

One Fiberglass (1) 24-person lifeboat meeting the requirements of 33 CFR §149.306 of this part will be provided on davits on the Control Platform on the 109 ft level. The boat will be totally enclosed and fire-protected, under approval series §160.135. The lifeboat will have the provisions and survival equipment required by 46 CFR §108.575(b) and be securely stowed (except for the boat hooks). A list will be posted in the lifeboat of this equipment. The manufacturer's instructions for maintenance and repair of the lifeboat, required under 33CFR §150.502(a) of this chapter, will be maintained at the deepwater port. The Life Boat will have a launching and recovery system that complies with 46 CFR §108.555. The Life Boat will be marked on both of the sides "Texas GulfLink Lifeboat 1, capacity 24-persons".

Rescue Boat

One (1) Rescue Boat meeting the requirements of 33 CFR §149.314 will be provided on davits on the 109 ft level. The Rescue Boat will have a launching and recovery system that complies with 46 CFR §108.555. The stowage and launching arrangement will permit the Rescue Boat to be boarded and launched in the shortest possible time. The Rescue boat will be fitted with a powered winch motor capable of rapidly recovering the boat when loaded with its full complement of persons and equipment.

Life Rafts

Three (3) life rafts meeting the requirements of §149.308 of this part will be provided on the 15 ft. level, one on the Metering Platform and two on the Control Platform each with a rated capacity of (12) twelve persons. Each inflatable life raft will be marked to meet 46 CFR §160.151–33, and, after

each servicing, marked to meet 46 CFR §160.151–57(m). The life rafts will be capable of rapid deployment provided with a painter line attached and allow personnel boarding from the boat landing platform. The painter will be capable for rapidly releasing by one person from within the loaded life raft.

Lifejackets

The Platform Complex will be provided with 70 life jackets. Life jackets will be stored in each berthing room to match the capacity of the room. Each lifejacket must be USCG approved, Type 1 with a light, retroreflective material and whistle as per 33 CFR §149.316. The life jackets will be stowed in readily accessible places adjacent to accommodation spaces, nearby the lifeboat muster station and in each berthing room. The lockable storage bins will be labeled in block letters "LIFE- JACKETS'' and number/size of Lifejacket inside. Two (2) Lifejackets will be stowed in each control room on the Metering Platform and Control Platform. The lifejackets will be conspicuously marked "TGL GA 423".

Life Rings

Twelve (12) twelve life rings will be provided that meet the USCG requirements under approval series §160.050 or §160.150, for SOLAS-approved equipment. They will be readily accessible in an emergency and stowed on each side of the platforms, on each level. The life rings will have a floating electric water light approved under approval series 161.010 and attached by a lanyard of 12-thread manila rope 3 – 6 ft. in length. The lights will be mounted on a bracket near the ring life buoy so that, when the ring life buoy is cast loose, the light will be pulled free of the bracket. The life ring will have an attached 100 ft. buoyant line and must be marked with Type II retroreflective material, approved under approval series §164.018. The life rings will be conspicuously marked "Texas GulfLink GA 423".

Fire Extinguishers

All portable and semi-portable fire extinguishers will be of an approved type under 46 CFR §162, subparts §162.028 and §162.039, respectively. The extinguishers will be located in the open, readily seen. The fire extinguishers will be installed in accordance with table §149.409. Portable and semi-portable extinguishers will be inspected and maintained in accordance with NFPA 10. Platform personnel will perform the annual and monthly inspections required by NFPA 10 as incorporated into the GulfLink computerized maintenance program.

Emergency Equipment Locker and Fireman's Outfits

A total of (7) seven firemen's outfits complying with 46 CFR §108.497 will be provided. An Emergency Bunker Gear Locker for the Fire Team will be provided with (5) fireman's suits on the Control Platform. A secondary locker will be located on the Metering Platform with (2) fireman's suits.

Emergency Treatment Room

The platform will have a dedicated Emergency Treatment Room located in the living quarters. The Treatment Room will be stocked with the necessary equipment for a First Responder to field treat an injured person. The entrance doorway will be wide enough to allow stretcher access.

Stokes Litter

One Stokes or other suitable litter, capable of safely hoisting an injured person will be provided in the treatment room.

General Alarm

A General Alarm will be fitted that is capable of being manually activated by using alarm boxes. It is audible in all parts of the platform complex, except in areas of high ambient noise levels where hearing

protection is required under 33 CFR §150.613 of this chapter; and will have a high intensity flashing light in areas where hearing protection is used. The alarms will be marked as “General Alarm” in yellow letters at least 1 inch high on a red background:

Cargo Transfer Alarm

The platform will be fitted with a Cargo Transfer System Alarm to signal a malfunction or failure in the system. It will capable of being activated at the Metering Platform as well as sound automatically in the control room. It will have a signal audible in all areas of the platform complex and have a high intensity flashing light in areas of high ambient noise levels where hearing protection is required. It will be distinguishable from the General Alarm. Each switch for activating the alarm will be identified in 1-inch red Letters on a yellow back ground ‘‘Oil Transfer Alarm’’.

(v) Pollution prevention equipment

Pressure Relief Valves: The Texas GulfLink Deepwater Port Offshore Facility will have automated as well as manually operated pressure relief valves installed in the oil transfer system that will prevent the system from over pressurizing. The relief valve system will divert oil and pressure into the surge relief tank located on the platform. The surge tank capacity is 2,000 bbls. They will be able to recirculate back into the cargo pipeline or be discharged to a support vessel.

Shut Off Valve: The oil pipeline will have a shut off valve installed on the platform at the end of the riser and before oil is delivered to the PLEM. The platform will also have an automated capability to shut this valve.

The two floating flexible cargo hoses will each have a blank flange and a shutoff valve at the vessel's cargo manifold. This valve will be controlled by the vessel Person-In-Charge of the transfer operation who will be in constant communication with the Operations Center. The SPM will also have a manually operated shutoff valve. Support boat personnel will activate this valve, when necessary. Support boats will be in constant communication with the Operations Center and the VTC during cargo loading operations.

Monitoring Systems: The TGL pipeline will incorporate a system that will automatically detect pressure variations and provide alarms to pipeline operators for each segment of the pipeline from the storage terminal to the platform. The system will also utilize available technology, including smart pigs to analyze malfunctions. See section (r)(6)(iii) for details on the control system and the SCADA system.

The marine transfer area will have a monitoring system that meets or exceeds the requirements of 33 CFR §154.525, if one is required by the cognizant U.S. Coast Guard Captain of the Port.

The cargo transfer system will have a failure monitoring system that will automatically detect potential malfunctions and will automatically activate alarms in the storage terminal control room ashore and the platform control room. The alarm will also be capable of being manually operated at the platform or at the storage terminal ashore. The alarm will have both a high decibel audible alarm as well as a high intensity flashing light alarm. The control room personnel will not be able to disable alarms, but once triggered they will be able to shut down the audible and light alarms. The tanker vetting process for vessels using the Texas GulfLink Deepwater Port will include a requirement for similar alarms aboard vessels intending to load cargo at the DWP. Alarms on the vessels will be activated by the vessel PIC. Alarms will be tested prior to each cargo transfer operation. Each switch to manually activate either the visual or audible alarms on the platform, at the onshore terminal, or aboard the vessel will be identified by a sign in red letters, at least one inch high, on a yellow background clearly designating the switch as the Oil Transfer Alarm.

In addition to the above, the proposed Metering Platform would include the following pollution prevention equipment:

- Oil Water Separator Tank and System.
- Deck Drains connected into Sump System.
- Raised coamings around Metering Platform and Control Platform levels 109 and 84.
- The platform complex will have sufficient curbs, gutters, drains, and reservoirs to collect, in the reservoirs, all oil and contaminants not authorized for discharge into the ocean according to the deepwater port's National Pollution Discharge Elimination System permit.
- Portable air powered transfer pumps with suction and discharge hoses.
- (2) 1000 bbl Surge Tanks to act as maintenance oil tank storage and surge relief storage.
- An ample supply of oil absorbent pads and sufficient sealable containers to store oily rags for transport and disposal shoreside.
- An ample supply of loose absorbent material to dispense on small spills and sealable containers to store the used contaminated material.
- An assortment of scoops, shovels, and brooms to address small leaks and spills.

Communications: Clear and constant communications is a key element of preventing incidents that could cause a pollution event. The below describes the proposed UHF Channels with dedicated frequencies for operations and emergency.

A microwave system with a VSAT satellite backup system will be installed at the Marine Terminal to allow uninterrupted continuous UHF communications between the Marine Terminal, Support Boats, Tanker and Oil Movement Controller at the operations control center. All hand-held radios will be Certified under 46 CFR §111.105–11 to be operated in Group D, Class 1, Division 1 Atmosphere, permanently marked with the certification. These UHF radios will be supplied for the All Metering Platform personnel, Mooring Masters, Assistant Mooring Masters, Deck Watches, and Tanker Control Room. Only radios certified for use in hazardous areas may be used on the Metering Platform and aboard the Tanker. Channels 1-5 will be recorded and Channel 6 will be used for local communications (Motorola HT-600 Handie-Talkie or equivalent).

Channel Assignments:

- 1 → SPM 1
- 2 → SPM 2
- 3 → Metering Platform Operators & Technicians
- 4 → Support Boats
- 5 → EMERGENCY
- 6 → Local communications (non-relay)

VHF Channels for continuous Port Communications to Tankers, Helicopters, and Vessels

The Platform Control Room will be fitted with (2) independent VHF radio communication systems. The Systems will be capable of monitoring multiple VHF channels (13, 16, 73/74) and multiple UHF channels simultaneously. Details and specific model information will be provided at a later date. A hand-held VHF and UHF Radio with spare batteries will be provided as secondary means of communication backup under multiple power failure events. The system will be capable of receiving and recording radio communications on several channels simultaneously, as well as

automatic channel priority selection based on user-specified criteria. The VHF Radio System will include an uninterruptable battery backup power supply.

VHF-FM FREQUENCIES
156.500 MHz. Channel 10, Commercial Work
156.800 MHz. Channel 16, Distress, Safety & Calling
156.725 MHz. Channel 74, Port Operations (or 156.675Mhz. Channel 73)

GAI-Tronics Page System: A Paging System will be fitted on the platform to allow for internal communications between personnel. The system will allow PA style pages that are followed up by picking up one of the remote call boxes located throughout the platform complex. Once a person retries the page communications it acts like a phone call between personnel.

Public Address System (PA): A PA system will be installed with coverage in both internal and external areas to allow for the broadcasting of alerts, emergency tones, cautionary messages, fire and emergency response details and instructions, and general messages to personnel. The system will tie-in to the GAI-Tronics Page system to allow for multiple station locations that can make a PA announcement.

Telephone System: All internal offices, common rooms, staterooms, and control rooms will be provided with a telephone unit that allows communication within the Marine Terminal with shoreside telephone access.

Emergency Communication: In the event the primary communications system outlined in CFR 33 §149.140 of this part fails, the Control Room will have portable hand-held UHF & VHF Radios. A portable hand-held satellite telephone with spare batteries will also be provided.

NPDES Containment: The entire platform will have installed coamings, gutters, small discharge containment, sumps, and reservoirs to collect all oil, including used lubricants and waste oil, and all contaminants not authorized for discharge into the ocean by the deepwater port's National Pollution Discharge Elimination System permit. Collected wastes will either be treated to permitted discharge standards or they will be transferred to support vessels for treatment and/or disposal ashore.

(vi) Waste treatment equipment

The wastewater treatment equipment at the Texas GulfLink DWP shall include a sanitary sewer system, which would treat the gray and black water produced on the platform prior to discharge overboard. Gray water typically consists of domestic sources, such as bathtubs, showers, sinks, washing machines, etc., while black water is sanitary sewage. Black and gray water originating from the living quarters would be aerated, would settle, and then be disinfected to regulatory standards by the sewage treatment system before being discharged overboard below the water line. Vertically oriented discharge pipes would extend below the water surface for discharge. Seawater would likely be supplied to the sewage treatment system by a jockey water pump.

A Red Fox Marine Sanitation device or equal would be fitted on the platform complex to meet or exceed the requirements of 33 CFR §159.53. The Red Fox Environmental Marine Series Units are Bureau Veritas certified for IMO & USCG Res. MEPC 227(64). The IMO Marine Environmental Protection Committee resolution applies to all sewage treatment systems installed onboard on or after January 1, 2016. The Marine Model is designed, manufactured, and tested to meet or exceed MEPC 227(64) effluent standards.

Example: Redfox Marine Series IMO MEPC 159(55) Certified Sewage Treatment System

Construction Specification
1/4" Thick ASTM-A-36 Steel
4 Chamber Design

- Aeration – 24-hour Retention
- Flooded Clarifier - Under Head
  Pressure Design 6-hour Retention
- Media Chamber - 30-Minute
  Retention
- Chlorine-Contact Chamber 30-
  Minute Retention
  2" Drain FMPT Fittings on Each Chamber
- Inlet Bar Screen
- Sludge Return Line (1) Skimmer Return Line (2) External Air Piping 316SS
- All External Connections FMPT Internal Fluid Piping Sch 80 PVC

Equipment Specifications

- Simplex Blower Assembly: Roots - Rotary Lobe Blower Pulley Guard
  Inlet Filter Silencer
- 0-15 PSI Gauge
- Bronze Clarifier Control Valves.
- Air Diffusers 316 Stainless Steel 3/4"
- Conbraco 6-PSI Pressure Relief Valve
- Chlorine Chemical Tank and Liquid Meter Assembly
- Discharge Pump Tsurumi 50PU2.4S Electric Submersible Pump
  NEMA 4X Control Panel for Blower and Discharge Pump Operation High Level Alarm
- Float Switch Controller for Discharge Operation
- Common Liquid Bleach Used

33 CFR 148.105(r)(6) Equipment Drawings

A description and preliminary design drawing of the following: (i) The cargo pumping equipment; The (ii) cargo piping system; (iii) The control and instrumentation system; (iv) Any associated equipment, including equipment for oil or natural gas throughput-measuring, leak-detection, emergency-shutdown, and the alarm system.

(i) Cargo Pumping

There are no cargo pumps on the Offshore Manned Platform. The cargo pumps are proposed to be at the onshore Jones Creek Terminal which is the origination point of the offshore pipeline. The pumping arrangement is as follows: Three (3) Vertical Booster Pumps will be used to provide suction pressure to the Mainline Pumps with soft start capability. The three (3) Booster Pumps will be installed in parallel, and will be located between the Storage Tanks and the Outgoing Metering System. They will provide 50% redundancy at 60,000 BPH. They will be capable of 85,000 BPH with all three running. Instrumentation and controls will be provided for the safe operation of the pumps and motors (e.g. pressure, temperature,

vibration). Six (6) Horizontal Centrifugal Mainline Pumps will be used for deliveries to the offshore platform. They will be controlled with Variable Speed Drives (VFD). The Mainline Pumps will operate in series, and will be located downstream of the Outgoing Metering System and upstream of the 42" Pipeline Pig Launcher. They will provide 50% redundancy at 60,000 BPH. They will be capable of 85,000 BPH with all three running. Instrumentation and controls will be provided for the safe operation of the pumps and motors (e.g. pressure, temperature, vibration). The pumping system will be operated by the system controllers at the Operations Control Center through the SCADA system. The control system overview is described in section (r)(6)(iii).

(ii) Cargo Piping

Cargo Piping on the offshore Meter Platform consist of following:

Once the offshore pipeline from the Jones Creek Terminal to the Offshore Manned Platform comes on to the platform the first portion of the cargo piping system would be a pipeline isolation valve just upstream of the pig receiver.

A Pipeline Pig Receiver designed for routine cleaning pig and Inline Inspection Tool (Smart Pigs). The pig receiver will be rated for ANSI 600#, 1440 psig. The Pig Receiver will have an end closure with a safety mechanism that complies with the requirements of ASME Section VII Division 1, UG-35. The receiver will have an eccentric reducer and a pig signal that would report both locally and to the SCADA system on the receipt of a pig.

A surge system will be included just downstream of the pig receiver. The surge system will include redundant surge valves, a surge relief tank, pressure monitoring and surge detection that would report both locally and to the SCADA system. The surge system would be designed to protect the offshore pipeline from the Jones Creek Terminal to the Offshore Manned Platform, the 2 pipelines from the Offshore Manned Platform to the PLEMs, and the SPM Marine Hose Systems. The surge system would include a pump to return any crude oil captured into the surge relief tank and back into the pipeline.

The offshore Manned Platform meter system will be a Custody Transfer Metering System rated for 85,000 BPH using Omni Flow Computers, Flow Meters (e.g. Turbine, Helical Turbine, Coriolis, etc.), Pressure Transmitters, and Temperature Transmitters to measure and calculate API Gross Observed Volume (GOV) and API Gross Standard Volume (GSV) Flow Rates. An automatic Sampler System will be used to measure Suspended Sediment and Water (S&W) in the pipeline to calculate API Net Standard Volume (NSV) Flow Rates. A Bi-Directional Volume Displacement Prover will be used to calibrate all meters calculating Corrective Meter Factors. The Metering System will be designed for Full Flow and Minimum Flow Rate during Start-Up and Vessel Topping Off. The Vessel Loading Custody Transfer Metering System will be built to API Manual of Petroleum Measurement Standards.

Just down-stream of the Custody Transfer Systems will be a valve manifold to direct flow to either one of the SPM CALMs. These valves would serve as isolation valves to each pipeline from the Offshore Manned Platform to the PLEMs.

(iii) Control System Overview

The proposed control system for the Texas GulfLink Offshore Load Port would consist of a tiered system consisting of the following layers:

- Operations Control Centers (OCC).
- Supervisory Control and Data Acquisition (SCADA).

- PLC Based Control System.
- PLC Based Safety System.
- Omni Flow Computers.
- Field Instrumentation.

Operations Control Centers. One Main OCC located On-Shore that is manned 24/7 with two (2) Control Desks will be used (one for Tank Farm Receipts and the other for Vessel Loading). A secondary OCC on the Offshore Platform will be used to assist with Off-Shore Platform Receipts and Vessel Loading. Microwave communications will be the primary communications link between the two (2) OCCs, with a Satellite VSAT as backup.

SCADA. Supervisory Control and Data Acquisition architecture that uses computers, servers, networked data communications, and graphical human machine interface (HMI) work-stations for high-level process supervisory management and alarm management. The SCADA system will be used to operate the entire process flow and storage of oil from Tank Farm Receipts to Vessel Loading via Operator Interfaces. SCADA will also be used for Pipeline Surveillance and Rupture Detection.

PLC Based Control System. A Programmable Logic Controller (PLC) industrial computer-based control system such as an Allen-Bradley ControlLogix that will interface with all field instrumentation (e.g. pressure and temperature transmitters, flow meters, limit switches, etc.) and all control equipment (e.g. valves, motors, pumps, etc.). All control algorithms, leak detection calculations, analog scaling, valve and pump interlocks, start permissives, start sequences, stop sequences, etc. will be housed and programmed into the PLC logic and described by Functionality Documents and IO Lists.

PLC Based Safety System. A Programmable Logic Controller (PLC) industrial computer-based control system such as an Allen-Bradley GuardLogix that will interface with all field safety instrumentation and equipment to provide Safety Shutdowns and Emergency Shutdowns (ESD) of systems and equipment when adverse unsafe conditions are present. All safety shutdown logic will be housed and programmed in the Safety PLC and will be described by SafeCharts after a Safety Integrity Level (SIL) assessment and SIL Level determination.

Omni Flow Computers. Omni Flow Computers, or an approved equal, will be used for control, measurement, and calculations of all Custody Transfer Metering Systems. The Flow Computers will directly collect measurement data from all field instrumentation and equipment such as Flow Meters (e.g. Turbine, Helical Turbine, Coriolis, etc.), Pressure Transmitters, and Temperature Transmitters to measure and calculate API Gross Observed Volume (GOV) and API Gross Standard Volume (GSV) Flow Rates. Automatic Sampler Systems will be used to measure Suspended Sediment and Water (S&W) in the pipelines to calculate API Net Standard Volume (NSV) Flow Rates. A Bi-Directional Volume Displacement Prover will be used to calibrate all Receipt and Delivery Meter Flow Rates by calculating Corrective Meter Factors.

Field Instrumentation. Field instruments will be used to measure all process variables such as pressure, temperature, flow, density, voltage, current, position, etc. Field equipment will be used for PLC control of all end devices such as open close valves, control valves, pumps, motors, etc.

ONSHORE JONES CREEK TERMINAL CONTROL SYSTEMS

Incoming Pipeline Pig Receiver. An incoming Pig Receiver for a 36" Pipeline will be connected to the DOE Bryan Mound facility. The maximum flow rate will be 60,000 BPH (1.4 Million BPD). The Pig Receiver will be equipped with automated valves, pressure transmitters, and a pig signal switch.

Incoming Metering. An Incoming Custody Transfer Metering System rated for 60,000 BPH using Omni Flow Computers, Flow Meters (e.g. Turbine, Helical Turbine, Coriolis, etc.), Pressure Transmitters, and Temperature Transmitters to measure and calculate API GOV and API GSV Flow Rates will be installed. An automatic Sampler System will be used to measure Suspended Sediment and Water (S&W) in the pipeline to calculate API NSV Flow Rates. A Bi-Directional Volume Displacement Prover will be used to calibrate all Receipt and Delivery Meter Flow Rates by calculating Corrective Meter Factors. The Incoming Custody Transfer Metering System will be built to API Manual of Petroleum Measurement Standards.

Tank Header Valve Manifold. A valve manifold with automated valves for receipt and delivery oil movement and storage.

Above Ground Tank Storage. Eight (8) 755,379 bbls Floating Roof Tanks with expansion capacity for a total of thirteen (13) tanks. 6,043,032 bbls shell capacity with 5,665,344 storage capacity with eight (8) tanks. 9,819,927 bbls shell capacity with 9,206,184 storage capacity with thirteen (13) tanks. Instrumentation and control equipment on tanks will include radar level measurement, high-high level safety switch, fire detection system, and automatic mixing agitators.

Outgoing Metering. An Outgoing Metering System rated for 85,000 bph to be used for Line Surveillance and Pipeline Leak Detection on the 42" Pipeline to the Off-Shore Platform. The Metering System will be designed for Full Flow and Minimum Flow Rate during Start-Up and Vessel Topping Off. Instrumentation and controls similar to the Incoming Metering System described above. The Outgoing Metering System will use the shared Prover along with the Incoming Metering System.

Tank Booster Pumps. Three (3) Vertical Booster Pumps will be used to provide suction pressure to the Mainline Pumps with soft start capability. The three (3) Booster Pumps will be installed in parallel and will be located between the Storage Tanks and the Outgoing Metering System. They will provide 50% redundancy at 60,000 bph. They will be capable of 85,000 bph with all three running. Instrumentation and controls will be provided for the safe operation of the pumps and motors (e.g. pressure, temperature, vibration).

Mainline Pumps. Six (6) Horizontal Centrifugal Mainline Pumps will be used for deliveries to the offshore platform. They will be controlled with Variable Speed Drives (VFD). The Mainline Pumps will operate in series, and will be located downstream of the Outgoing Metering System and upstream of the 42" Pipeline Pig Launcher. They will provide 50% redundancy at 60,000 bph. They will be capable of 85,000 bph with all three running. Instrumentation and controls will be provided for the safe operation of the pumps and motors (e.g. pressure, temperature, vibration).

Pig Launcher. The Pig Launcher (to the offshore Platform) will be equipped with automated valves, pressure transmitters, and a pig signal switch.

Leak Detection. A Computational Pipeline Monitoring (CPM) leak detection system that will comply with 49 CFR §195.134 and API RP 1130 will be provided on all receipt and delivery pipelines using internal systems (e.g. Pressure Point Analysis, Mass Balance Method, Statistical Systems, Real Time Transient Model RTTM) and external systems (e.g. acoustic systems, video monitoring). The Leak Detection System

will continuously monitor and analyze the pipeline with predictive software and algorithms to provide effective leak detection analysis and location capabilities.

OFFSHORE PLATFORM CONTROL SYSTEMS

The Major Deepwater Port offshore Platform will have one (1) 42" Crude Oil Subsea Pipeline (28.3 Nautical Miles) from the beach to the platform. Maximum operating pressure of 1440 PSIG.

The platform will have two (2) 42" Departing Pipelines, one to each Single Point Mooring (SPM) buoy. Each SPM boy will be approximately 1.25 nautical miles from the Platform.

The Platform will use a Catenary Anchored Leg Mooring (CALM) system. An On-Board SPM Load Monitoring System with a radio connection to the Port Security Control Room will be used.

A 24/7 manned Port Radar and Security Camera Control Room will be used for the proposed safety zone monitoring.

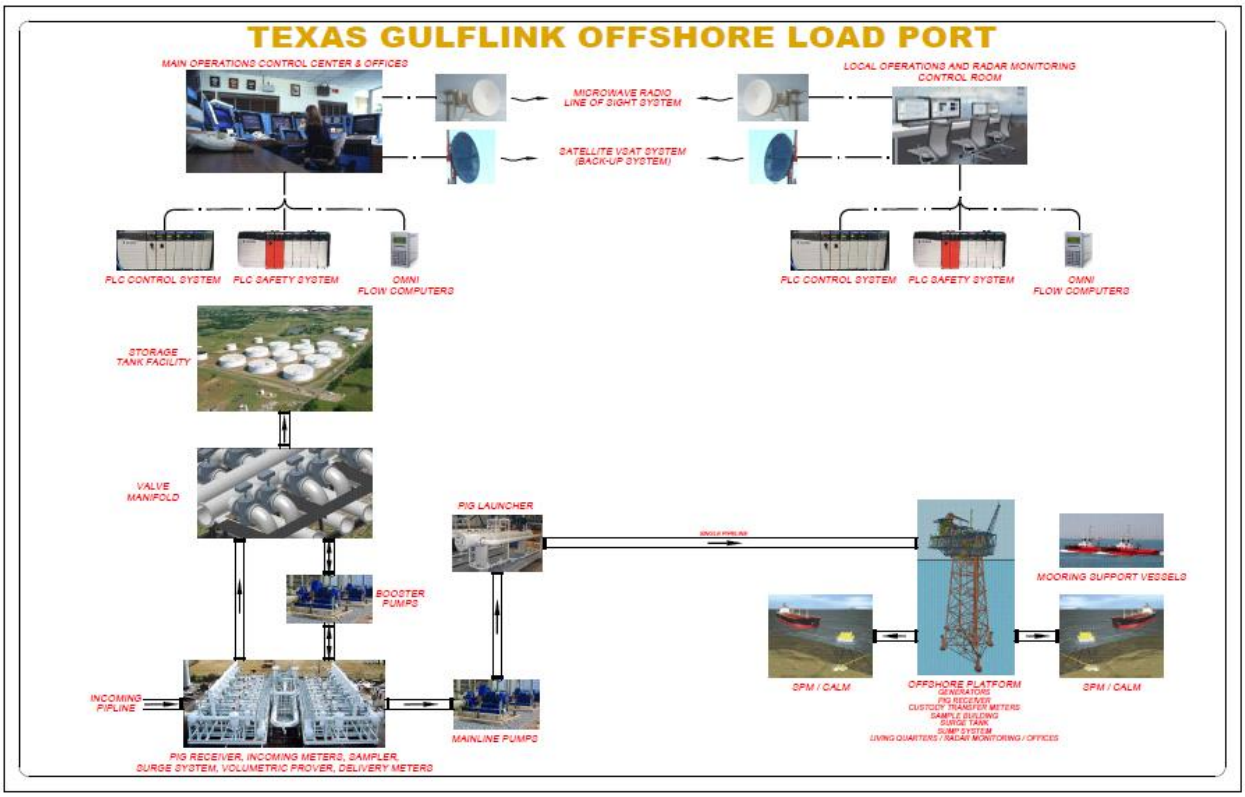
A secondary MCC on the offshore platform will be used to assist with offshore Platform Receipts, Metering, and Vessel Loading.

The PLC-based Control System and PLC-based Safety System will provide measurement, controls, and safety shutdowns similar to those incorporated with the onshore Terminal as described above.

The Control Systems for the offshore platform consists of the following equipment and systems:

- A Pig Receiver for receipts from the onshore Terminal.
- A Surge Relief System (consisting of a Surge Relief Valve and Surge Tanks) for pipeline and marine hose pressure protection. The Surge Valve setpoint is 175 psig to protect the marine loading hoses which are rated at 275 psig.
- A Vessel Loading Custody Transfer Metering System rated for 85,000 bph using Omni Flow Computers, Flow Meters (e.g. Turbine, Helical Turbine, Coriolis, etc.), Pressure Transmitters, and Temperature Transmitters to measure and calculate API GOV and API GSV Flow Rates. An automatic Sampler System will be used to measure Suspended Sediment and Water (S&W) in the pipeline to calculate API NSV Flow Rates. A Volume Displacement Prover will be used to calibrate all Vessel Loading Meters by calculating Corrective Meter Factors. The Vessel Loading Custody Transfer Metering System will be built to API Manual of Petroleum Measurement Standards.
- A sump system with level measurement and automated pumps.

Figure 28. Texas GulfLink Network Architecture



(iv) Associated Equipment

Offshore Manned Platform meter system will be a Custody Transfer Metering System rated for 85,000 BPH using Omni Flow Computers, Flow Meters (e.g. Turbine, Helical Turbine, Coriolis, etc.), Pressure Transmitters, and Temperature Transmitters to measure and calculate API Gross Observed Volume (GOV) and API Gross Standard Volume (GSV) Flow Rates. An automatic Sampler System will be used to measure Suspended Sediment and Water (S&W) in the pipeline to calculate API Net Standard Volume (NSV) Flow Rates. A Bi-Directional Volume Displacement Prover will be used to calibrate all Receipt and Delivery Meter Flow Rates by calculating Corrective Meter Factors. The Metering System will be designed for Full Flow and Minimum Flow Rate during Start-Up and Vessel Topping Off. The Vessel Loading Custody Transfer Metering System will be built to API Manual of Petroleum Measurement Standards.

A Computational Pipeline Monitoring (CPM) leak detection system that will comply with 49 CFR §195.134 and API RP 1130 will be provided on all receipt and delivery pipelines using internal systems (e.g. Pressure Point Analysis, Mass Balance Method, Statistical Systems, Real Time Transient Model RTTM) and external systems (e.g. acoustic systems, video monitoring). The Leak Detection System will continuously monitor and analyze the pipeline with predictive software and algorithms to provide effective leak detection analysis and location capabilities.

The offshore metering platform will include surge valves and surge tanks that will protect the pipeline and the SPM hoses from over pressure. The marine hoses at both SPMs will incorporate a Marine Breakaway Coupling. The Marine Breakaway Coupling has two distinct safety features. The first is the shut off of flow upon an overpressure situation. The second allows for the separation of the hoses if a vessel loses its mooring minimizing risk of damage and spillage.

The emergency-shutdown and alarm system will conform to API Recommended Practice 14C: Recommended Practice for Analysis, Design, Installation, and Testing of Basic Surface Safety Systems for Offshore Production Platforms. A Programmable Logic Controller (PLC) industrial computer-based control system such as an Allen-Bradley GuardLogix that will interface with all field safety instrumentation and equipment to provide Safety Shutdowns and Emergency Shutdowns (ESD) of systems and equipment when adverse unsafe conditions are present. All safety shutdown logic will be housed and programmed in the Safety PLC and will be described by Safe-Charts after a Safety Integrity Level (SIL) assessment and SIL Level determination.

§148.105(r)(7) Personnel Capacity

The personnel capacity of each deepwater port pumping platform complex.

The maximum number of persons on the platform complex will be 40 (the assigned complement of 20 persons plus an additional 20 temporary personnel). The three floor, fixed living quarters will be located on the 109' level of the Control Platform (50 ft x 36 ft x 35 ft) and be outfitted with 20 bunks, offices, galley, medical room, mess deck, exercise room, and a lounge. HVAC units will be placed on the roof of the living quarters. The control room will be mounted on the roof of the living quarters (30 ft x 15 ft x 12 ft) with glass windows facing SE with an uninterrupted view of the proposed safety zone and moored tankers. It will contain the radar stations, communication equipment, radios, surveillance CCTV displays, alarm panels, and monitoring equipment. The control room will be manned 24-hours-per-day by the Vessel Traffic Controller. There will be two (10) man containerized temporary housing units provided on the 109' level of the Metering Platform (40 ft x 10 ft x 10 ft) each with 10 bunks and a bathroom. The temporary housing units will be used for contract workers working short term contracts. The Control platform will have a lifeboat on the 109' level with a mustering area. A 60 ft x 60 ft helicopter deck will be mounted over the living quarters. The 84' level of the Control Platform includes generators, storage building, MCC building, and jib crane. The 69' level includes air compressor skid, inert gas skid, firefighting system, and a rescue boat. The 109' level (upper deck) of the Metering Platform will have the pig receiver skid, temporary quarters, MCC building, crane, and radar tower. The 84' level (cellar deck) will be fitted with dual meter skids, prover skid, a lab, and (2) 1000 bbl surge tanks. Boat landings will be fitted on the 15' level of each platform with 12-man life rafts mounted for rapid release and boarding. The platforms will be connected to each other by a 125 ft Bridgeway on the 84' level.

The (draft) Operations Manual contains detailed job qualifications, duties, and responsibilities for each position in Section 10 "Deepwater Port Personnel –Duties and Qualifications." See Volume IV, Appendix D, TGL Operations Manual [**Confidential**].

33 CFR §148.105(s) Refurbished OSC Facilities and Co-located Fixed Offshore Components

Refurbished OCS facilities and co-located fixed offshore components.

The TGL Project does not intend to utilize refurbished OCS facilities, equipment, or co-located fixed offshore components.

33 CFR §148.105(t) Offshore Pipelines

§148.105(t)(1) Offshore Pipelines Descriptions and Drawings

A description and preliminary design drawing of the marine pipeline, including:

(i) Size

The proposed offshore pipeline is planned to exit the shoreline south-southwest of the mouth of the Brazos River. The shoreline exit will be done by Horizontal Directional Drill (HDD). The offshore pipeline is planned to be one 42" outside diameter, 28.3 nautical miles in length extending from the shoreline HDD exit point to the offshore manned platform located in OSG Galveston Block 463. The pipeline will be designed to American Society of Mechanical Engineers (ASME) #600 Class.

There are two proposed 42" outside diameter pipelines from the offshore manned platform to each of the SPM Pipeline End Manifolds (PLEM). Each pipeline is 1.25 nautical miles in length. Both pipelines will be designed to American Society of Mechanical Engineers (ASME) # 150 Class.

(ii) Throughput Capacity

The proposed pipeline system will have an average throughput capacity of approximately 1,100,000 barrels per day. The normal average flow rate is approximately 60,000 barrels per hour with and a maximum flow rate of 85,000 barrels per hour.

(iii) Length

The offshore pipeline from the shore line exit to the offshore platform is 28.3 nautical miles (171,957.8') in length. The offshore pipelines from the offshore platform to both SPMs are 1.25 nautical miles each.

(iv) Depth of Cover

The offshore pipeline will be buried a minimum of 3 ft. below the mudline from the top of pipe and in the shipping fairway it will be buried a minimum of 10 ft. below the mudline from the top of pipe, per 30 CFR §250.1003 (a)(1) and 49 CFR §195.218.

For existing pipeline crossings, approved concrete matting and/or sand bags would be added to maintain separation.

When pipeline construction activity will impact safety fairways, TGL will provide advanced notification to the US Coast Guard.

(v) Protective devices

The pipeline will be monitored 24/7 by specially trained controllers at the operation control center.

The pipeline will have a computational pipeline monitoring system (CMP) for liquid pipeline system for leak detection based on 49 CFR §195.134, utilizing API 1130. The leak detection system will also have rupture detection which will result in an immediate shut down to minimize damage and environmental impact.

The pipeline will be protected from over pressure by a surge system at the Manned Offshore Platform. The surge system will include redundant surge valves, surge relief tanks, pressure monitoring, and surge detection that would report both locally and to the SCADA system. The surge system would be designed to protect the offshore pipeline from the Jones Creek Terminal to the Offshore Manned Platform, the 2 pipelines from the Offshore Manned Platform to the PLEMs and the SPM Marine Hose Systems. The surge system would include a pump to return any crude oil captured into the surge relief tanks back into the pipeline.

TGL will conduct routine right of way flyovers (aerial patrols) of the pipeline by operator-qualified individuals, via sea plane, helicopter, or drone.

The proposed offshore pipelines will be protected from corrosion by an anti-corrosion coating and galvanic sacrificial anodes. The proposed pipeline will have high density concrete weight coating which will provide additional mechanical protection to the exterior surface of the TGL offshore pipelines between the shoreline and the offshore manned platform and between the offshore manned platform and the 2 SPM PLEMs. The pipeline will be buried a minimum of 3 ft. below the mudline from the top of pipe and in the shipping fairway it will be buried a minimum of 10 ft. below the mudline from the top of pipe. The platform risers will be protected with fenders connected to the platform near the water line.

Regular cleaning pigs will be run in the pipeline on a periodically established basis per the final TGL Integrity Management Plan (IMP). As part of the final Integrity Management Plan, in-line inspection tools (smart pigs) that comply with 49 CFR §195.591 will be run internally, as prescribed in the final IMP. For more information, see Volume IV, Appendix J, Proposed Hazardous Liquid Pipeline Integrity Management Program Manual [**Confidential**].

§148.105(t)(2) Marine Pipelines Design Criteria

The design criteria to which the marine pipeline will be designed and built.

The design criteria of the 42-inch offshore pipeline and riser from the shoreline to the Manned Offshore Platform are as follows:

- Design Life: 30 years
- Maximum Flow Rate: 85,000 bph
- Maximum Operating Pressure: (MOP) 1,480 psig
- Maximum Water Depth: 110 feet
- Corrosion Coating: Fusion Bond Epoxy Coating
- Cathodic Protection: Aluminum Bracelet Anodes or sled type anodes
- Maximum Crude Oil Temperature: 100° F
- Concrete Coating Weight: 140 lb. minimum
- Pipeline Burial: 3 ft. top of pipe and 10 ft. top of pipe in shipping fairway crossings
- Pipeline Material: API 5L

The design criteria of the two (2) 42-inch offshore pipelines and risers from the Manned Offshore Pipeline to the SPM PLEMs (laterals) are as follows:

- Design Life: 30 years
- Maximum Flow Rate: 85,000 bph
- Maximum Operating Pressure: (MOP) 275 psig
- Maximum Water Depth: 110 feet
- Corrosion Coating: Fusion Bond Epoxy Coating
- Cathodic Protection: Aluminum Bracelet Anodes or sled type anodes
- Maximum Crude Oil Temperature: 100° F
- Concrete Coating Weight: 140 lb. minimum
- Pipeline Burial: 3 ft. top of pipe
- Pipeline Material: API 5L

§148.105(t)(3) Marine Pipelines Design Standards and Codes

The design standards and codes to be used.

The design standards, codes and recommended engineering for the offshore pipelines are as follows:

Code of Federal Regulations (CFR)

- 30 CFR §250 Sub Part J Pipelines and Pipeline Rights-of-Way
- 49 CFR §195 - Transportation of Hazardous Liquids by Pipeline

American Petroleum Institute (API):

- API 5L Specification for Line Pipe
- API RP 5LW Recommended Practice for Transportation of Line Pipe on Barges and Marine Vessels
- API 1104, Welding of Pipelines and Related Facilities, STD
- API 1111, Design, Construction, Operation, and Maintenance of Offshore Hydrocarbon Pipelines (Limit State Design), RP

DNV-OS-F101 Offshore Standard for Submarine Pipeline Systems provides acceptance criteria and design procedures for pipelines. The standard applies modern limit-state-design principles with 'safety classes' linked to consequences of failure. The DNV GL standard is complemented by several recommended practices (RPs):

- DNVGL ST F103 Sub-marine Pipeline Systems
- DNV-RP-C205 Environmental Conditions and Environmental Loads
- DNV-RP-F102 Pipeline Field Joint Coating and Field Repair of Line-pipe Coating
- DNVGL-RP-F103 Cathodic protection of submarine pipelines
- DNV-RP-F105 Free-Spanning Pipelines
- DNV-RP-F106 Factory Applied External Pipeline Coatings for Corrosion Control
- DNV-RP-F107 Risk Assessment of Pipeline Protection
- DNV-RP-F108 Fracture Control for Pipeline Installation Methods Introducing Cyclic Plastic Strain
- DNV-RP-F109 On-bottom Stability Design of Submarine Pipelines
- DNV-RP-F110 Global Buckling of Submarine Pipelines
- DNV-RP-F111 Interference between Trawl Gear and Pipelines
- DNV-RP-F113 Pipeline Subsea Repair
- DNV-RP-F116 Integrity Management of Subsea Pipeline Systems
- DNVGL-RP-O501 Managing sand production and erosion
- 0029/ND Rev 1 - 14 December 2015 - Guidelines for submarine pipeline installation

International Organization for Standards (ISO)

- ISO 13623:2009 Petroleum and natural gas industries – Pipeline transportation systems
- ISO 15589-2:2012 Petroleum, petrochemical and natural gas industries – Cathodic protection of pipeline transportation systems – Part 2: Offshore pipelines

American Society of Mechanical Engineers (ASME)

- ASME B31.4 Pipeline Transportation Systems for Liquid Hydrocarbons and Other Liquids
- ASME B16.5 Steel Pipe Flanges and Flange Fittings

- ASME B16.20 Metallic Gaskets for Pipe Flanges – Ring-Joint, Spiral-Wound, and Jacketed
- ASME B16.47 Large Diameter Steel Flanges NPS 26 Through NPS 60 Metric/Inch Standard
- ASME B16.34 Valves – Flanged, Threaded, and Welding End

National Association of Corrosion Engineers (NACE) International

- SP016813 Control of External Corrosion on Underground and Submerged Metallic Piping Systems

§148.105(t)(4) Marine Pipelines Engineering Practices

The title of each recommended engineering practice to be followed.

For Engineering Practices, see Volume IV, Appendix H, Engineering and Design Basis for Texas GulfLink [**Confidential**].

§148.105(t)(5) Marine Pipelines Metering System

A description of the metering system that will measure the flow rate.

The proposed offshore pipeline will have a metering system at the onshore terminal and a metering system at the offshore metering platform.

Both proposed metering systems will be design for the maximum flow rate of the system which is 85,000 barrels per hour. The metering systems will utilize dual helical turbine meters. The metering system at the offshore metering platform will be a custody transfer meter system.

The Outgoing Metering System (onshore) will be rated for 85,000 BPH to be used for Line Surveillance and Pipeline Leak Detection on the 42" Pipeline to the Off-Shore Platform. The Metering System will be designed for Full Flow and Minimum Flow Rate during Start-Up and Vessel Topping Off. Instrumentation and controls similar to the Incoming Metering System described above. The Outgoing Metering System will use the shared Prover along with the Incoming Metering System.

Offshore Manned Platform meter system will be a Custody Transfer Metering System rated for 85,000 BPH using Omni Flow Computers, Flow Meters (e.g. Turbine, Helical Turbine, Coriolis, etc.), Pressure Transmitters, and Temperature Transmitters to measure and calculate API Gross Observed Volume (GOV) and API Gross Standard Volume (GSV) Flow Rates. An automatic Sampler System will be used to measure Suspended Sediment and Water (S&W) in the pipeline to calculate API Net Standard Volume (NSV) Flow Rates. A Bi-Directional Volume Displacement Prover will be used to calibrate all Receipt and Delivery Meter Flow Rates by calculating Corrective Meter Factors. The Vessel Loading Custody Transfer Metering System will be built to API Manual of Petroleum Measurement Standards.

§148.105(t)(6) Submerged or Buried Pipelines Crossed by Marine Pipelines

Information concerning all submerged or buried pipelines that will crossed by the offshore pipeline, and how each crossing will be made.

The proposed 42" offshore pipeline from the shoreline to the offshore platform would cross two (2) submerged buried cable and 5 existing submerged buried pipelines. The pipeline route is described in Volume III, Appendix R, Offshore Survey Report.

The crossing details will be designed in coordination with the owners of the pipelines and the cables. There are two options to cross the existing pipelines associated with the project. One option would be to route the TGL 42-inch pipeline under the existing pipelines. The second option is the lower the existing pipeline and route the TGL 42-inch pipeline over the existing pipelines. For both options, 18-inch vertical separation would be maintained using concrete bag, mats or a combination of concrete bags and mats. A minimum of 3 ft. of cover would be maintained at each crossing. See Table 4 below for pipeline and cable crossings.

Table 5. Texas GulfLink Pipeline and Cable Crossing Lease Blocks

Pipeline/Cable Owner	Lease Block
Back Pool Pipeline (Possible)	N/A near shore
ExxonMobil Pipeline	BA-341
American Midstream Pipeline	BA-341
Mariner Energy Pipeline	BA-364
BP GoM Exploration Cable	GA-393
Petrocom Cable	GA-393
Transcontinental Pipeline	GA-392

There are no crossings associated with the two pipelines from offshore metering platform to the PLEMs and the SPM CALM buoys.

§148.105(t)(7) Pipelines Transporting Product and Connected to the Port

Information on the pipeline that will connect to the deepwater port, including a detailed analysis that shows throughput and capacity rates of all pipelines involved in the transport of product to/from shore.

The Texas GulfLink Terminal Project would construct a Deepwater Oil Port near Freeport, Texas capable of loading deep draft crude carrying vessels. Crude oil would be transported from the shore-based terminal to the DWP via one (1) 42-inch diameter ANSI 600# (1480 psig) pipeline, 39.11 nautical miles in length (45.02 statute miles).

The port would utilize two (2) single point mooring buoys (SPMs), each having: two (2) 24-inch inside diameter crude oil under-buoy hoses interconnecting with the crude oil pipeline end manifold (PLEM); two (2) 24-inch inside diameter floating crude oil hoses connecting the moored VLCC or other crude oil carrier for loading to the SPM buoy; The floating hoses would be approximately 1100 ft. in length and rated for 275 psig (19-bar). Each floating hose would contain an additional 110 ft. of 16-inch "rail tail hose" that is designed to be lifted and robust enough for hanging over the edge railing of the VLCC or other crude oil carrier. The under-buoy hoses would be approximately 160 ft. in length and rated for 275 psig (19-bar).

Two (2) 42-inch diameter ANSI 150#, (285 psig) 1.25 nautical miles long pipelines would provide the interconnection between the DWP platform and the PLEM and SPM buoys.

The proposed pipeline system capacity is 85,000 bph.

A proposed 9.45 statute mile 36-inch diameter pipeline would connect the proposed onshore Jones Creek Terminal to the DOE Facility in Bryan Mound with connection the Houston market. The proposed capacity of the pipeline is 60,000 bph.

For the proposed onshore pipeline routing, see Volume II, Appendix D, Proposed Onshore Pipeline Routing.

For details on the proposed onshore horizontal directional drill (HDD) plans, see Volume II, Appendix C, Proposed HDD Execution Plan.

For the proposed offshore pipeline routing, see Volume III, Appendix R, Offshore Survey Report.

33 CFR §148.105(u) Onshore Components

§148.105(u)(1) Description of Onshore Facilities

Information on the pipeline that will connect to the deepwater port, including a detailed analysis that shows throughput and capacity rates of all pipelines involved in the transport of product to/from shore A description of the location, capacity, and ownership of all planned and existing onshore pipelines, storage facilities, refineries, petrochemical facilities, and transshipment facilities that will be served by the deepwater port. Crude oil or natural gas gathering lines and lines wholly within a deepwater port must be included in data about onshore components only if specifically required. Entry point and major connections between lines and with bulk purchasers must be included.

The proposed onshore storage/supply components for the TGL Project would consist of:

- One (1) tank storage facility in Jones Creek (Brazoria County) with thirteen (13) aboveground external floating roof storage tanks, each with a total storage capacity of 708,000 barrels of crude oil storage capacity, for a total onshore storage capacity of approximately 9.2 million barrels of crude oil.
- One (1) 9.45 mile 36-inch outside diameter pipeline from the existing Department of Energy (DOE) facility in Bryan Mound with connectivity to the Houston market.
- One (1) 12.4 mile 42-inch outside diameter connection from the new Jones Creek Terminal to the shore crossing where this becomes the subsea pipeline supplying the TGL DWP.

Jones Creek Terminal

A new tank storage facility would be constructed in Jones Creek to provide interconnectivity with the crude oil supply network for the proposed Project. This new storage facility would include the following equipment:

- Two (2) incoming custody transfer meter skids, each with 3 or 4 helical turbine meters would be placed within the proposed Jones Creek Terminal. One (1) skid would be located at the incoming pipeline and one (1) skid would be located at the outgoing pipeline header leading to the TGL DWP.
- Separate sampling systems for each of the two custody transfer skids and one (1) shared displacement prover.
- Three (3) electric-driven vertical can pumps to drain dry the tanks and provide sufficient suction pressure for the mainline centrifugal pumps.
- Six (6) variable frequency drive, electric-driven centrifugal pumps to pump crude oil at or up to 1,440 psi to provide maximum flow of 85,000 BPH to the DWP. All pumps would be variable speed to accommodate adjustable flow rates.
- One (1) pig launching trap for the 42-inch pipeline.
- One (1) pig receiver trap for the 36-inch pipeline from connecting Exxon pipeline.
- One (1) emergency generator for continued use during loss of commercial power
- One (1) firewater pump and freshwater well to address tank seal fires and small facility emergencies
- Central operations control center (OCC) for overall controls of the pipelines and tank facility using Supervisory Control and Data Acquisition (SCADA) microwave communications.
- A firewater tank would be constructed and designed to contain up to the working capacity needed to respond to a tank seal fire. In the event of a fire, water from the firewater tank would be used to contain the fire. A foam system would be used to extinguish fires up to a tank seal fire. The

firewater and foam system at the proposed Jones Creek Terminal would be designed in accordance with NFPA requirements.

- Vapor combustor units would be installed at the proposed Jones Creek Terminal to destroy VOC vapors during tank maintenance or inspection activities while the tank roof is set on legs.
- Ancillary facilities at the Jones Creek Terminal would include an electrical substation providing electrical service to all systems at the Jones Creek Terminal and office and warehouse buildings. The electrical substation would be powered via the existing electrical transmission line located adjacent to the Jones Creek Terminal site.

Incoming Pipeline to Jones Creek Terminal

One (1) 36-inch outside diameter pipeline would be constructed from the existing DOE Terminal to the proposed Jones Creek Terminal. This 9.45 statute-mile pipeline would be located in Brazoria County, Texas. This pipeline would generally follow a west and northerly route to the Jones Creek Terminal following existing energy infrastructure, to the extent practicable. During operation, a 30-foot permanent ROW would be maintained for the pipeline where available.

The incoming pipeline to Jones Creek Terminal would have a new pig launcher constructed at the origination point at/near the existing DOE Terminal and would also have a new pig receiver constructed at the termination point within the proposed Jones Creek Terminal.

One (1) outgoing custody transfer meter skid, with 2-3 helical turbine meters would be placed at the origin of the connect within the proposed shipper.

Jones Creek Terminal to Shore Crossing Pipeline

One (1) 42-inch outside diameter crude oil pipeline would be routed from the proposed Jones Creek Terminal to the shore crossing where this becomes the subsea pipeline supplying the TGL DWP. This 12.4 statute-mile pipeline would be located in Brazoria County, Texas, and would generally follow an east and southerly route. During operation, a 30-foot permanent ROW would be maintained for the single pipeline, and 50-foot ROW for the 42-inch and 36-inch combined, where available.

See Volume II, Appendix C for HDD details.

See Volume II, Appendix D for Proposed Onshore Pipeline Routing details.

A chart showing the location of all planned and existing facilities that will be served by the port, including: Onshore pipelines; Storage Facilities; Refineries; Petrochemical facilities; Transshipment facilities.

(u)(2)(i) Onshore pipelines;

Figure 29. 36 in. Pipeline from DOE 40 in. Pipeline Operated by ExxonMobil Pipeline

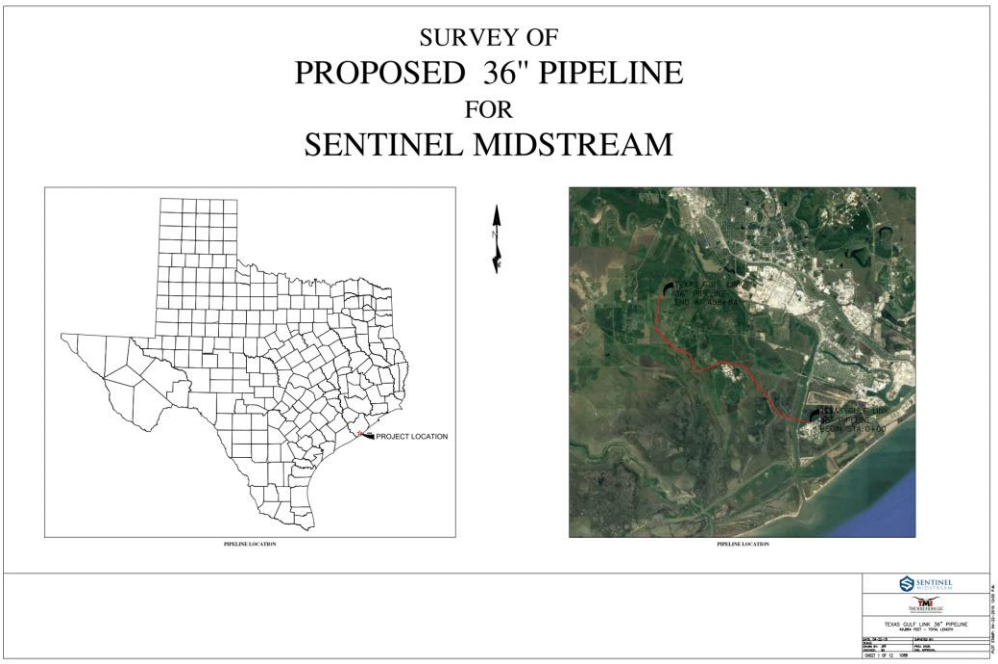
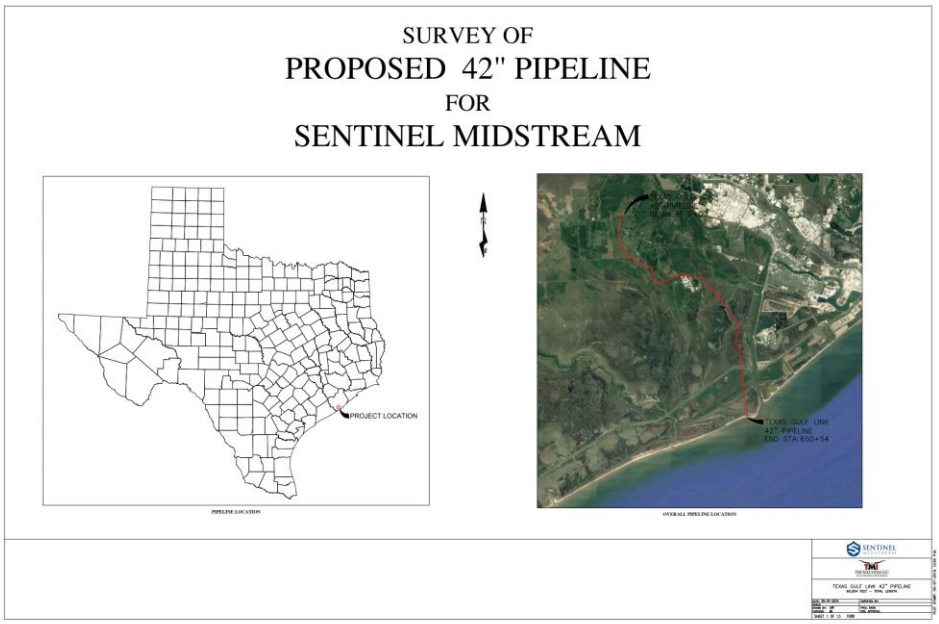


Figure 30. 42 in. Pipeline from the Jones Creek Terminal to the Shoreline



(u)(2)(ii) Storage Terminal;

Figure 31. Location of Storage Terminal

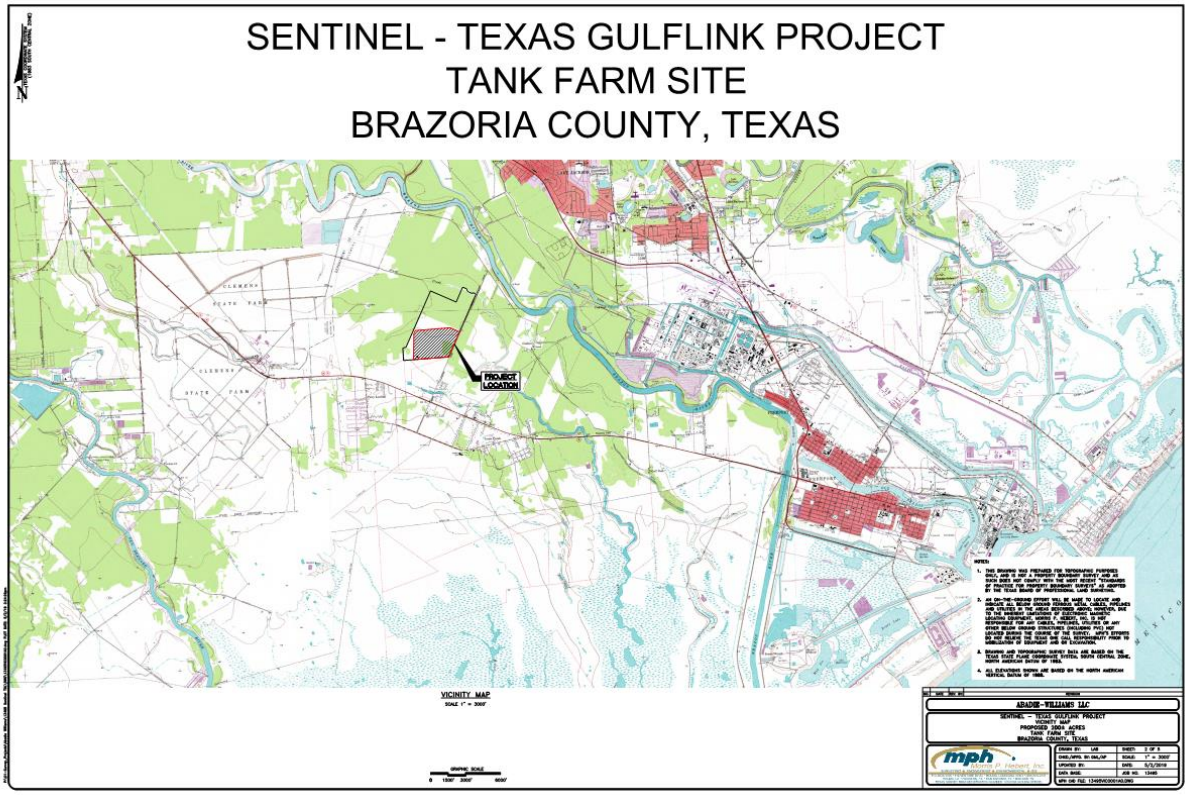


Figure 32. Location of Storage Terminal Plan View

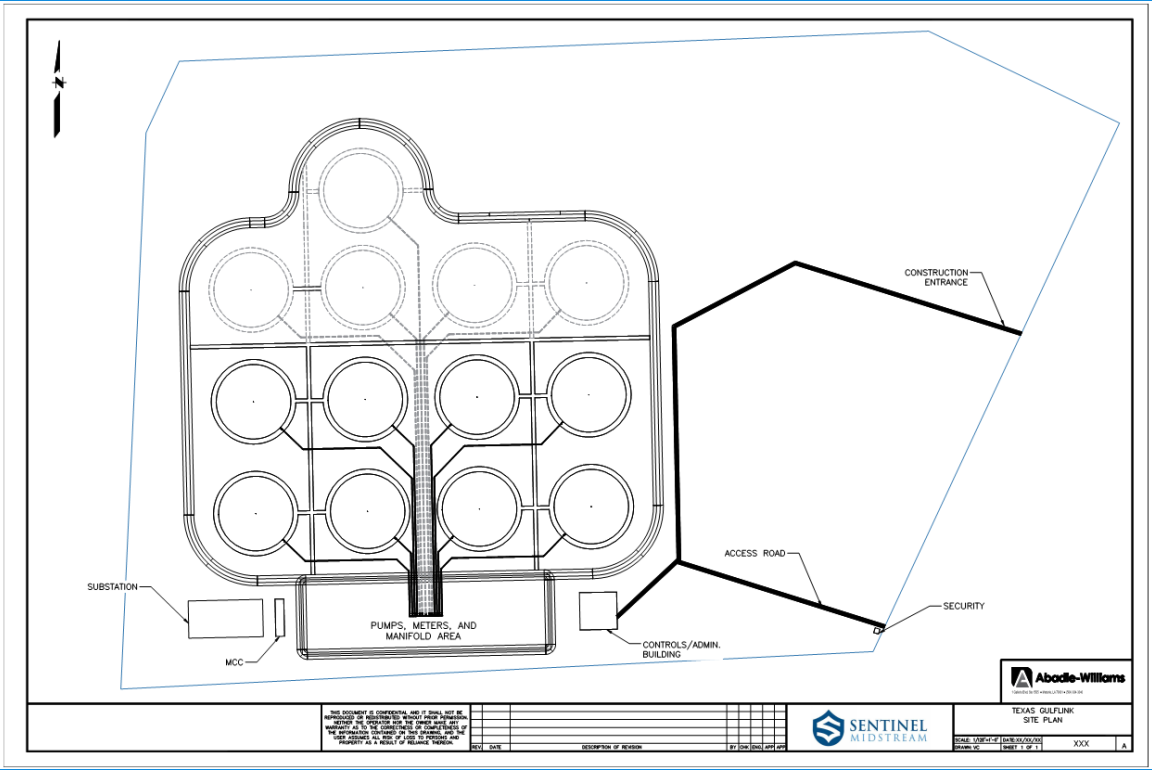
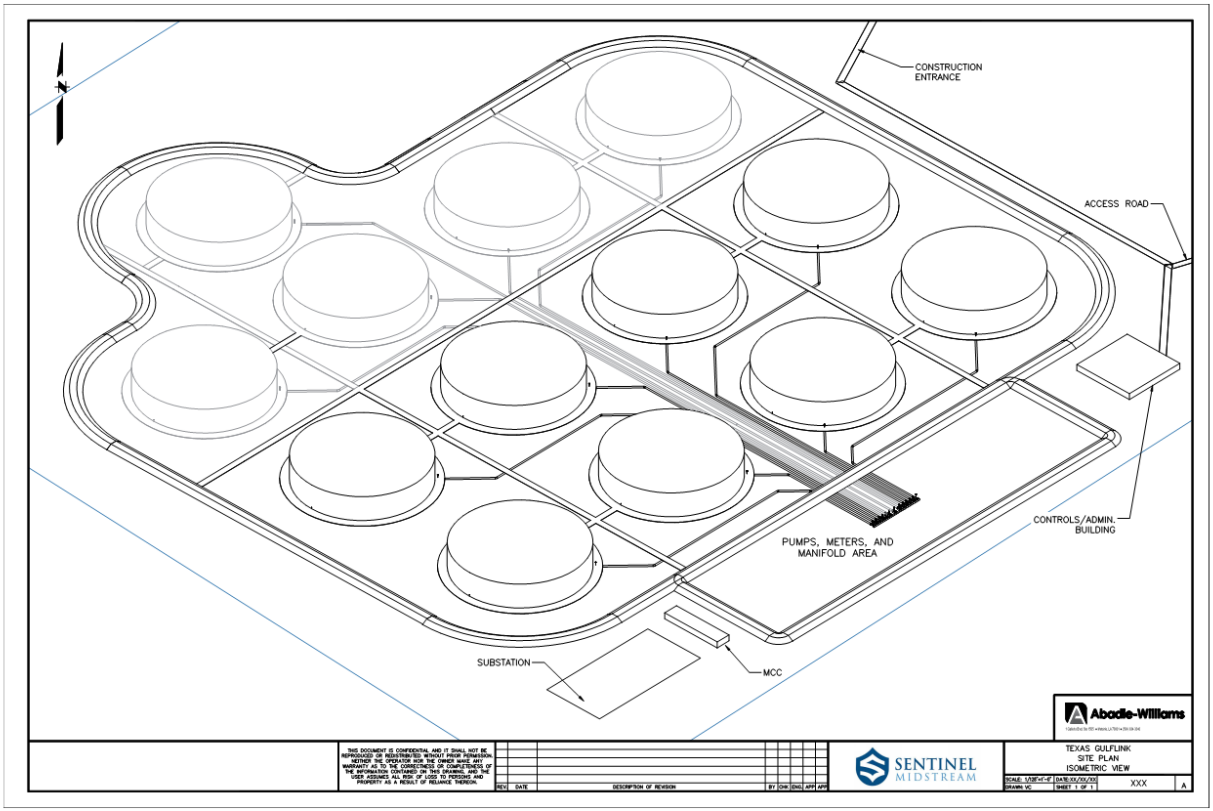


Figure 33. Jones Creek Terminal Isometric Site Plan



(u)(2)(iii) Refineries

The Texas GulfLink Deepwater Port and onshore assets do not have a direct connection with any domestic, United States refineries.

(u)(2)(iv) Petrochemical Facilities

The Texas GulfLink Deepwater Port and onshore assets do not have a direct connection with any domestic, United States petrochemical facilities.

(u)(2)(v) Transshipment Facilities

The Texas GulfLink Deepwater Port and onshore assets do not have a direct connection with any domestic, United States transshipment facilities.

§148.105(u)(3) Proposals and Agreements

A copy of all proposals or agreements with existing and proposed refineries that will receive oil transported through the deepwater port, the location and capacity of each such refinery, and the anticipated volume of such oil to be refined by each such refinery.

A copy of the proposals and agreements related to throughputs are provided in Volume V, Appendix K, Proposals and Agreements; Volume V, Appendix L, Throughput Commitments. At the time of filing, Texas GulfLink is actively negotiating proposals and commitments from additional customers. Texas GulfLink will advise MARAD and USCG as those negotiations become formalized into commitments or agreements.

33 CFR §148.105(v) Miscellaneous Components

§148.105(v)(1) Radio Station and Communications Systems

A description of each radio station or other communications facility to be used during construction and operation of the deepwater port and its proposed concept of operation.

Upon approval from MARAD for the Deepwater Port license, Texas GulfLink will apply for a Radio Station License with the FCC. The communications between the Onshore Operations Control Center will be performed via a Microwave System. All SCADA signals, radio communications, and corporate network will be transmitted via the Microwave System. Form FCC 605 will be filed to apply for authorization to operate a radio station.

UHF Channels with dedicated frequencies for operations and emergency.

A microwave system with a VSAT satellite backup system will be installed at the Marine Terminal to allow uninterrupted continuous UHF communications between the Marine Terminal, Support Boats, Tanker and Oil Movement Controller at the operations control center. All Hand-Held Radios will be Certified under 46 CFR § 111.105–11 to be operated in Group D, Class 1, Division 1 Atmosphere, permanently marked with the certification. These UHF radios will be supplied for the All Metering Platform personnel, Mooring Masters, Assistant Mooring Masters, Deck Watches and Tanker Control Room. Only radios certified for use in hazardous areas may be used on the Metering Platform and aboard the Tanker. Channel 1-5 will be recorded and Channel 6 will be used for local communications. (Motorola HT-600 Handie-Talkie or equivalent).

Channel Assignments:

- 1 → SPM 1
- 2 → SPM 2
- 3 → *Metering Platform* Operators & Technicians
- 4 → Support Boats
- 5 → EMERGENCY
- 6 → Local communications (non-relay)

VHF Channels for continuous Port Communications to Tankers, Helicopters, and Vessels

The Platform Control Room will be fitted with (2) independent VHF radio communication systems. The Systems will be capable of monitoring multiple VHF channels (13, 16, 73/74) and multiple UHF channels simultaneously. Details and specific model information will be provided at a later date.

A Hand-held VHF and UHF Radio with spare batteries will be provided as secondary means of communication backup under multiple power failure events.

The system will be capable of receiving and recording radio communications on several channels simultaneously, as well as automatically channel priority selection based on user-specified criteria.

The VHF Radio System will include an uninterruptable battery backup power supply.

<u>VHF-FM FREQUENCIES</u>
156.500 MHz. Channel 10, Commercial Work
156.800 MHz. Channel 16, Distress, Safety & Calling
156.725 MHz. Channel 74, Port Operations (or 156.675Mhz. Channel 73)

GAI-Tronics Page System

A Paging System will be fitted on the platform to allow for internal communications between personnel. The system will allow PA style pages that are followed up by picking up one of the remote call boxes located throughout the platform complex. Once a person retries the page communications it acts like a phone call between personnel.

Public Address System (PA)

A PA system will be installed with coverage in both internal and external areas to allow for the broadcasting of alerts, emergency tones, cautionary messages, fire and emergency response details and instructions, and general messages to personnel. The system will tie-in to the GAI-Tronics Page system to allow for multiple station locations that can make a PA announcement.

Telephone System

All internal offices, common rooms, staterooms, and control rooms with be provided with a telephone unit that allows communication within the Marine Terminal with Shoreside telephone access.

Emergency Communication

In the event the primary communications system outlined in §149.140 of this part fails. The Control Room will have portable hand-held UHF & VHF Radios. A portable hand-held satellite telephone with spare batteries will also be provided.

Construction Phase Communications

During the construction phase of the Deepwater Port, the principal methods of communications will be by Cellular Communications, Satellite Communications, and VHF Radio (on a working channel). All boats will monitor VHF 16.

SCADA

A SCADA communication control system will be installed to allow remote control and monitoring of all Marine Terminal valves, meters, surge system, emergency shut-down, flow, leak detection, and all aspects of the oil transfer system from the Oil Movement Controller Operations Center. Remote video displays with control capabilities will be provided in the Offshore Manned Platform, Radar Control Room, Port Superintendent's Office, Metering Platform Control Station, and Operations Control Center.

The SCADA system will precisely monitor, control, and visualize every aspect of operations within the Texas GulfLink pipeline Oil Transfer System for intelligent control using new high-performance technology.

Network Workstations

Texas GulfLink will provide a Marine Terminal Network that will be a subpart of the shoreside Texas GulfLink Network. Multiple workstations will be provided for access to the Texas GulfLink Network. Computer-based training and record keeping will be provided on the Network. At a minimum, there will be workstations in the Offshore Manned Platform Radar Control Room, Mooring Master, Surveyor, Port Superintendent Offices, Metering Platform Operations Station, and Computer Training Room. Marine Terminal records, logs, reports, checklists, communications, schedules, and data will be uploaded and maintained on the Network. The Texas GulfLink Operations Manual will be maintained on the Network.

Email address

All Texas GulfLink personnel will be assigned a Texas GulfLink email address. The Vessel Traffic Controller, Oil Movement Controller, Mooring Masters, Assistant Mooring Masters, and Port Superintendent will also be assigned a shared address for each group for operational communications. Tankers will send/receive

email messages with the Vessel Traffic Controller concerning operational requirements and logistical support.

§148.105(v)(2) Radar Navigation System

A description of the radar navigation system to be used in operation of the deepwater port outlined in the operations manual.

The Offshore Manned Platform will include a 24/7 manned Radar Control Room manned by a Vessel Traffic Controller. The Offshore Manned Platform radar system will include Automatic Radar Plotting Aids (ARPA) and will be used to assist vessels with the SPM mooring operations. All vessels calling on the port, including the support boats will be required to have a SOLAS 2009 ARPA system on board, as specified in regulation 19 of that code, per 33 CFR §164.38.

RADAR

Characteristics and Location

There will be two radar antennas one 3cm, X-Band (2-4 GHz) and one 10cm, S-Band (8-12 GHz). The antennas will be mounted high up on the platform tower to be free of interference. Two RADAR displays we be provided in the Radar Control Room capable of switching to either the 3cm or 10cm antenna. The radar displays will be integrated into a packaged vessel traffic management system.

ECDIS

A packaged vessel traffic management system will be purchased and installed to allow:

- Multi-Radar Tracking Integration
- Multi-sensor Tracking (AIS/RADAR)
- Automatic Target Acquisition and identification, with guard zones
- Target maneuver prediction and history
- Radar Video Presentation
- Extensive chart functions, including editing
- Record and playback features
- AIS dynamic and static presentation
- A Redundant Screen Station will be provided

AIS

The GulfLink Marine Terminal will be fitted with an AIS system capable of broadcasting the Platform's position and receiving all nearby AIS message traffic. The AIS system will be incorporated into the radar display unit for the purpose of identifying targets. The AIS unit will be a properly installed, operational Coast Guard type-approved AIS Class A device and will meet the performance standards and carriage requirements adopted by IMO.

The radar system will be used to monitor the proposed Texas GulfLink's Safety Zone (TGSZ) for non-authorized vessel entering the zone.

A typical ARPA function gives a presentation of the current situation and uses computer technology to predict future situations. An ARPA assesses the risk of collision, and enables operator to see proposed maneuvers by own ship.

§148.105(v)(3) Vessel Bunkering Methods

A description of the method that will be used for bunkering vessels using the deepwater port.

Bunkering will not be permitted within the proposed Texas GulfLink Deepwater Port Safety Zone, Approach Safety Fairway, or inside any future Anchorage Area created by the USCG. The immediate area, outside of the proposed Texas GulfLink Safety Zone and anchorage, is not restricted from bunkering operations and is within the Freeport Lightering Area's 10 nm radius. Tankers must make arrangements for bunkering with their agents. Texas GulfLink is not responsible for the bunkering arrangements or operations.

The Texas GulfLink Support Boats will refuel at the Shoreside Support Facility or Boat Company Docks. No diesel fuel storage is provided for the Support Boats on the platform. Support Boats may not transfer fuel between two boats inside the TGSZ.

§148.105(v)(4) Vessels for Bunkering, Mooring, and Servicing Vessels

A brief description of the type, size, and number of vessels that will be used in bunkering, mooring, and servicing the vessels using the deepwater port.

A long-term charter contract will be entered into to construct and/or supply support boats for the Texas GulfLink Deepwater Port for an extended period.

Additional information on Support Boats is provided in Volume IV, Appendix D, TGL Operations Manual [**Confidential**] Section 11 "Support Boats".

Two Line Boats will be utilized to handle the hawsers, hoses, and towing at the SPM, and provide logistical support for personnel transfers. A boat capable of providing an effective escort for the Tankers' transits and a Service Boat capable of providing the working platform to support underwater and surface repairs, maintenance, and inspections we be provided.

Three (3) to Four (4) Support Boats will be acquired for use depending whether or not a multi-purpose support boat can be found to cover a dual role of Escort Tug and Service Boat. All Tankers will be provided with an escort while in transit. There will be no dedicated Security Boat as the Support Boats will be used collectively to provide that service. When any of the Support Boats are taken out-of-service for inspection or repair, a substitute boat may be chartered to cover the duties of the missing boat.

Escort Tug

The Escort Tug will be a Tractor Style Tug capable of direct and indirect towing. The primary function of the Escort Tug will be to escort the Tankers inbound and outbound while made fast to the Tanker's stern. Additionally, it will be necessary for the Escort Tug to push on the Tanker's hull.

SPECS: Twin Azimuth Drive, 8000+ hp, Towing Winch, full fendering, Firefighting Monitors, Spill Boom on Reels, Skimmers, Crane and Pilot Boarding stations p/s.

Service Boat

The Service Boat's primary function will be to service all components at the Deepwater Port. A dive-capable support team will be maintained on the Service Boat to conduct underwater maintenance, inspections, and repairs. The Service Boat will be tasked for transporting personnel and equipment to the Freeport shoreside base of operations.

SPECS: Twin Screw, 3000+ hp, tunnel-style thrusters fwd/aft, Additional Diesel (10,000gal) & Water Tanks (7,000gal) to support platform, 25t crane, Open Stern Deck, Oily Water Tank (75,000gal) for hose end water plug, and dive support apparatus.

Line Boats (2)

The Line Boats will be used to control the cargo hoses and mooring hawsers in mooring operations, transport personnel between the platform and the Tanker, tow on the stern of the Tanker, and Set-up tie-back lines on the cargo hoses. They will be utilized for all assisting operations in close proximity or alongside the Tanker. The Line Boats may be tasked for transporting personnel and equipment to the Freeport base of operations. The Vessel Traffic Controller may dispatch the Line Boats to assist with unauthorized vessel at the Deepwater Port.

SPECS: 2000+ hp, Twin Screw, Guards of Screws, full fendering, pilot boarding platform p/s, towing winch, additional aft facing wheel house, twin or flanking rudders, and bow designed to contact cargo hoses.

Services Available to Support the Tankers at the Deepwater Port.

Shoreside services available at the Texas GulfLink Deepwater Port will be arranged by the Tanker's Agent. No facilities or logistical support services are provided by the Texas GulfLink Support Boats. The Tankers Agent, Customs and Immigration Officials do not normally attend the Tanker. Available services are:

- Bunkering (not inside the proposed Safety Zone, Approach Safety Fairway or Designated Anchorage)
- Crew Changes and Personnel attendance by Launch Boat
- Stores or Spares by Launch Boat
- Garbage transfer to an approved Facility ashore by Launch Boat
- USCG Certificate of Compliance (COC) Inspections
- High Interest Vessel (HIV) Inspections
- Helicopter Services

Vessels other than Tankers or Texas GulfLink Support vessels must get clearance from the Vessel Traffic Controller prior to entering the proposed Texas GulfLink Safety Zone or ATBA. Pre-approved crew launches and stores boats may enter the proposed Texas GulfLink Safety Zone after obtaining permission to enter from the Vessel Traffic Controller. The authorized crew launches or stores boats must proceed directly to the Tanker and immediately depart the proposed Safety Zone when operations are complete. Government boats will be given permission to transit the proposed Safety Zone but must avoid the ATBA. No stores or crew boat will be permitted alongside when the Tanker is maneuvering at the SPM.

§148.105(v)(5) Shore-Based Support Facilities Operations Management

A description and location of the shore-based support facilities, if any, that will be provided for vessels that will be used in bunkering, mooring, and servicing the vessels using the deepwater port; or that serve as offices or facilities in support of the deepwater port operations.

The shore-based support facilities will include a warehouse for spare parts and response equipment. An additional shore-based facility for marine hose management will be included. The Hose Management Facility will be a shore-based facility with water access. This facility will build hose string assemblies and hawser for the SPMs and provide shore-based support. Standard hose assembly length is approximately 1,100 ft. The Marine Hose Management Facility will also provide dock space for support vessels.

§148.105(v)(6) Radio Station License

A copy of the actual radio station license, or, if not available, a copy of the application sent to the Federal Communications Commission, if available.

Once a detailed design of the microwave and VHS radio systems has been completed, TGL will submit applications for a Federal Communications Commission license(s). This will be completed prior to construction and commissioning. A copy of the FCC license applications will be provided to MARAD and the USCG.

33 CFR §148.105(w) Construction Procedures

A description of the method and procedures to be used in constructing each component of the deepwater port, for example, shore-side fabrication, assembly and support, including anticipated dates of completion for each specific component during each phase of construction.

Fabrication and Procurement

The Texas GulfLink proposed Offshore Platform Facility will consist of two (2) 4-pile platforms with an interconnecting bridge structure. The deck which will direct the oil flow to the SPM buoys will be referred to as the Metering (MP) platform. The other platform will be referred to as the Vessel Traffic Control (VTC) platform, and will be manned with the control center for the offshore terminal. The deck equipment will be fabricated by vendors and erected onto the deck at the fabrication yard. Pre-commissioning and weighing will be performed at the vendor's facility before being accepted and delivered to the platform fabrication yard. The chosen fabrication yard will be an existing yard located along the Gulf Coast.

The living quarters will be fabricated in parallel with the platform fabrication schedule. The living quarters will be transported, and made as a separate lift from the topsides to reduce the overall lift weight of the platforms. The living quarters will be constructed in an existing yard along the Gulf Coast.

The jacket risers will be fabricated and tested at a GOM vendor facility and pre-installed on the jacket before the jacket is loaded out.

The line pipe procurement will include FBE, ARO, and Concrete Weight Coating as necessary. The line pipe will be coated and stored along the Gulf Coast to facilitate logistics for the installation.

Flanges for the spool pieces and risers will be ordered to meet the fabrication schedule.

The two (2) PLEMS will be fabricated by the SPM contractor. The SPM buoy, floating hose, under buoy hoses, ship hawser, PLEM, and Mooring system will be included as part the entire SPM contractor scope of work.

Construction Procedures

Pre-Lay Survey

A Light Construction Vessel (LCV) will be equipped with survey equipment and Remotely Operated Vehicles (ROVs) to perform a visual inspection of the proposed pipelay route to locate any hazards that were not previously detected during the original survey. The platform and SPM buoy locations will be surveyed for any hazards. All crossings will be clearly marked in preparation to lower the existing pipelines and cables.

Pipeline and Cable Crossings Preparations

The 42" offshore pipeline from the shoreline to the offshore platform would cross two submerged buried cables and five existing submerged buried pipelines. The pipeline route is described in Volume III, Appendix R, Offshore Survey Report.

The crossing details will be designed in coordination with the owners of the pipelines and cables. There are two options to cross the existing pipelines associated with the project. One option would be to route the TGL 42-inch pipeline under the existing pipelines. The second option is to lower the existing pipeline and route the TGL 42-inch pipeline over the existing pipelines. For both options, an 18-inch vertical separation would be maintained using concrete bag, mats or a combination of concrete bags and mats. Cathodic protection insulation will be ensured for integrity management considerations. A minimum of 3

ft. of cover would be maintained at each crossing. This work will be performed with a Diver Support Vessel (DSV) manned with divers and ROV assistance when possible. See Table 4 below for pipeline and cable crossings.

There are no crossings associated with the 2 pipelines from the offshore metering platform to the PLEMs and the SPM CALM buoys.

The proposed 42" offshore pipeline from the shoreline to the offshore platform would cross two (2) submerged buried cable and 5 existing submerged buried pipelines. The pipeline route is described in Volume III, Appendix R, Offshore Survey Report.

Table 5. Texas GulfLink Pipeline and Cable Crossing Lease Blocks

Pipeline/Cable Owner	Lease Block
Back Pool Pipeline (Possible)	N/A near shore
ExxonMobil Pipeline	BA-341
American Midstream Pipeline	BA-341
Mariner Energy Pipeline	BA-364
BP GoM Exploration Cable	GA-393
Petrocom Cable	GA-393
Transcontinental Pipeline	GA-392

There are no crossings associated with the two pipelines from the offshore metering platform to the PLEMs and the SPM CALM buoys.

Fairway Crossing

For the fairway crossing, dredging options have been evaluated. The soil conditions will be evaluated for pre-trenching methodology. Ten (10) ft. of protective cover is required for the 42" pipeline crossing in the fairway. Texas GulfLink will notify the US Coast Guard prior to conducting pipeline laying operations in the Safety Fairway.

Direct Drill Line Pipe Installation

As soon as the line pipe has been coated and ready for installation, the pipeline installation will commence with the direct drilling scope on the beach. Site preparation will be required to set up the drill site. A designated area will be defined for the drill site with an area that will accommodate the direct drill equipment, support equipment and pipeline storage and welding assembly.

The direct drilling technique will be used to drill the pipeline from shoreline to approximately one mile offshore with an adequate amount of pipe for the shallow water lay vessel to be able to recover the end of the pipeline onto the truss stinger located on the stern of the shallow water lay vessel. The depth of drill, entry angle, departure angle, and exit location will be designed according to the geological features acquired from the soil borings. The direct drilling contractor will have the entry and exit point of the pipeline presented in elevation and plan view and physically mark these locations in the field. A spud barge or anchored barge equipped with a crane operating a dredge bucket will dig the exit pit. Spoils will be spread along the sea bottom within the construction right of way. The pit will allow for a pilot hole to be exited confirming the correct drill entry and exit angle of the direct drill path.

The direct drill pilot exit hole will be located along the 20' contour line which will be approximately one (1) nautical mile from the coastline. A hazard survey was performed from the beach to platform and SPM buoy locations to confirm if there were any obstructions along the pipeline route.

Pipeline Installation

A shallow water conventional anchored pipelay vessel will be required to recover the end of the direct drilled pipeline. Primary goal is to use the same vessel to lay the pipeline to the offshore facility and SPM buoys. This will be contingent on equipment availability and the final design of the pipeline. A larger vessel may be utilized beyond the 40-ft to 60-ft water depth for continuing pipeline installation.

The end of the direct drill section of pipeline will be recovered and pulled into the welding stalls on the shallow water lay vessel. The drilling head will be removed from the direct drill on the end of the pipeline. The concrete coated pipeline will be connected/welded to the direct drill section of pipe, and lowered to the sea floor and begin laying the pipe towards the meter platform target box. The 42" pipeline from the direct drill exit location is approximately 28.3 nautical miles to the meter platform location.

The pipeline located beyond the 40-60' water depth range may require a larger anchored or dynamic positioning (DP) pipelay vessel depending on the back-tension installation requirements.

The following activities will be executed for the installation of the offshore pipeline:

- Cathodic protection anodes will be pre-installed on the pipe joints at the coating yard.
- Cargo barges, towed by tugs will transport the coated pipe to the job site.
- The cargo barges will be secured alongside the pipelay vessel to transfer the pipe joints from the barge to the pipelay vessel.
- Pipe ends will be cleaned and beveled for welding
- Pipe joints will be welded, the barge will be moved ahead by anchors or DP propulsion. The welds will be inspected and field joint coating applied before each movement.

After each new joint of pipe is welded and inspected, the pipelay barge/vessel will move forward with the anchor lines. The bow anchors will in-haul while the stern anchors pay out cable. The lateral anchor wires will keep the pipelay barge retrained laterally. The pipeline will move through the pipelay vessel's tensioner machines to hold the required constant tension on the pipeline to prevent buckling. The pipelay vessel will remain on the proposed route by DGPS survey. The actual touchdown of the pipeline on the sea bottom will be verified by a Remotely Operated Vehicle (ROV) with USBL positioning equipment to provide real time positioning. The feedback from the ROV will allow the pipelay vessel to make adjustments as required to center the pipeline within the ROW.

This process will be repeated until the end of the pipeline has reached the target box near the meter platform. A flange will be welded to the end of the pipeline and will be bolted with a laydown head. The pipeline will be lowered with a laydown head that allows a rigging arrangement to be secured to the head. The end of the pipe will be lowered through the truss stinger with the A & R winch cable until it rests on the sea bottom. The end of the pipeline position will be confirmed by subsea survey positioning. After the position has been obtained, the rigging will be disengaged.

The SPM 1 pipeline from the meter platform to the SPM 1 target box will commence with an initiation cable connected to the platform. The end of the SPM 1 pipeline will be installed with a flange connected

to a lay down head. Approximately 1.25 nautical miles of 42" pipeline will be laid from the meter platform to the SPM 1 target location.

The pipeline will be welded and inspected laying pipe on the sea floor and moving away from the meter platform facility target box to the SPM target box location. An abandonment head will be connected to the end of the pipeline with a flange connection. The pipeline will be lowered onto the sea bottom with the Abandonment and Recovery (A & R) winch cable. The end of the pipeline location will be verified using subsea survey positioning. After the end of the pipeline position has been confirmed, the A & R cable will be disconnected and recovered to the surface. The barge will be repositioned to the meter platform to commence the installation of the SPM 2 pipeline. The initiation cable at the meter platform will lower the start-up head and the pipeline to the sea floor. Approximately 1.25 nm of 42" pipeline will be laid from the meter platform to the SPM 2 target box location.

Pipeline Flooding, Gauging and Cleaning

After completion of the pipelay, the LCV ROV will be deployed to the pipeline A & R head at the SPM PLEM target box/platform ends. The ROV will plug in a down line from the LCV to flood/clean and gauge each of the pipelines. At the shore, the crew will recover the pig/gauge plate for inspection. Pressure testing will take place after the completion of the trenching operations.

Post Installation burial

Soil borings will be taken along the proposed pipeline route. The soil information will be used to determine the best-engineered solution to bury the pipelines.

At this time, we have assumed that a Jet trenching system or a plow resting on top of the pipeline will be used to lower the pipeline to the required cover. If necessary, several passes will be required to lower the pipeline to the required depth to meet the cover requirements.

Precautions will be taken at crossing locations. During the pre-lay survey of the 42" pipeline, existing line locations will be surveyed and marked with marker buoys. Existing pipeline will be thoroughly surveyed, and the route clearly marked. At this stage of the trenching, all pipeline and cables would have been lowered to the required depth with similar trenching and burial equipment used to lower the 42" pipeline.

Slower jetting speed is required near the crossings. The trencher/plow will be lifted over the crossing area and just outside the pre-marked crossing area, and resume jetting operation to lower the 42" pipeline.

After the pipelines have been lowered, a post burial survey will be performed to verify that the pipeline has the required protective cover.

Testing of the pipelines

After the pipelines have been buried, the LCV will be deployed to the deepwater end of the pipelines and assisted by an ROV, a downline will be connected to the pipeline termination head. Upon completion of topping off with filtered, treated, and dyed seawater, the pressurization, air inclusion, stabilization, 8 hour hold test and depressurization will commence. The filtered, treated, and dyed seawater shall be treated and can remain in the pipeline for a period of up to 9 months after testing without causing corrosion or damage to the pipeline.

Platform Installations

The Texas GulfLink platform and marine components will be installed using the following methodology as indicated. The Jacket will be loaded out vertically with piles loaded on the same material barge. The piles would include at least three sections. In sequence, the platforms can be installed before the completion

of the 42” pipeline from shore the meter platform facility or afterwards. The only difference will be the pipeline initiation process at the meter platform location.

The Derrick Barge will be mobilized to the platform facility location. The sea bottom will be inspected for debris prior to placing the jacket on the bottom. The jacket will be transported in the vertical position with the lift rigging pre-installed. The material barge will be brought alongside the Derrick Barge and secured. The jacket rigging will be secured to the derrick barge hook while the jacket tiedowns are cut loose. The jacket will be lifted and set on the sea bottom to the correct orientation utilizing a pre-installed gyrocompass to get the proper jacket orientation to align with the pre-installed pipeline. The jacket position will be determined by DGPS. Once on the sea bottom, the jacket levelness will be measured. The jacket levelness and attitude will be recorded to determine the pile stabbing sequence. For example, the pile stabbing will commence with stabbing the on the high side of the jacket. The piles will be installed by driving and welding two (2) piles at the same time and either the same side of the jacket or diagonally opposite sides of the jacket. The jacket will be secured to the piles.

The first pile section would be long enough to penetrate the sea floor, and become self-supporting with the additional penetration driven with a hydraulic hammer to the top of the jacket. The length of the pile add-on sections will be determined using the weight of the hammer required to achieve penetration without over stressing the pile from the weight of the hammer inducing the excessive bending stresses on the pile. Subsequent pile sections will be lifted and stabbed onto the previous pile sections with pre-installed stabbing guides on the bottom of the add-on pile sections. The jacket levelness will be checked during pile installation. Typically, two (2) piles are installed simultaneously in diagonally opposites sides of the jacket. If required, intermediate jacket leveling will be performed to assure that the jacket is installed within the levelness tolerances.

The final pile sections will be secured to the top of the jacket leg using a crown type shim.

The topsides and living quarters will be loaded on a separate material barge and sent to the field while the shims are being installed on the jacket legs. The topsides will be lifted and set on top of the pile cut sections. The bottom of the deck legs will have stabbing guides that are stabbed into the pile sections at the top of the jacket. Once an adequate amount of weld material has been installed on the deck leg/pile splice, the quarters package will be lift and set onto the topsides. The quarters package will be secured by welding to the topsides framing. The hook-up connections between the quarters and the platform will be executed using a jack-up or small construction barge.

The process will be repeated for the metering platform. The bridgeway connecting to the platforms will be rigged to and cut loose from the material and set onto the adjacent platforms. All electrical and mechanical connections between the two (2) platforms can be completed with a jack up support barge. The platforms will be mechanically complete and commissioning checks performed. The commissioning of the platform and pipelines can commence with pipeline dewatering by injecting hydrocarbons into the pipeline from the onshore terminal to the offshore metering platform.

SPM Buoy Installations

The construction vessel will be relocated to the SPM location No. 1 to install the shallow driven pile to support the PLEM No. 1. After the PLEM pile has been driven, the PLEM will be lowered to sit on the PLEM pile.

Six (6) SPM mooring piles, with chains connected, will be installed with the chains pre-laid towards the center of the buoy location. Messenger wires will be run through the chain stoppers threading the

mooring chains up through the chain stoppers, until all six (6) chains are connected and the buoy is secured. The SPM buoy will have the under-buoy hose connected before lifting. Divers will connect the under-buoy hoses to the PLEM connections. The loading hoses will be connected to the buoys, along with the ship mooring hawsers. The same process will take place at the SPM No. 2 buoy location.

Spool Piece Tie-ins

Pipeline tie-ins will be installed after the pipelines have been tested.

The initial spool dredging (if/as required) and spool metrology at the SPM PLEM and platform locations will be performed by a LCV following trenching and subsequent hydrotesting of the pipelines, in advance of the DSV mobilization.

The following metrology measurements will be taken as soon as the structures are in place:

- 42" export pipeline from shore located in target box to Meter platform riser flange connection
- Meter platform 42" riser flange to 42" SPM 1 pipeline flange located in target box
- SPM 1 pipeline flange located in target box next to SPM PLEM 1 valve flange
- Meter platform 42" riser flange to 42" SPM 2 pipeline flange located in target box
- SPM 1 pipeline located in target box next to SPM PLEM 2 valve flange

Spool piece fabrication will be partially complete before the metrology measurements are taken. Once the measurements are taken, the information will be provided to the spool piece fabricator where by the final fabrication on each spool piece will be completed. All spool pieces will be pressure tested before leaving the yard. Spool pieces will be transported by material barge and tug. A DSV equipped saturation diving spread with a crane capable of handling the 42-inch OD spool pieces will perform the installation. Once the spools are installed, the DSV/divers may install protective mattresses on the spools.

Post Spool Tie-ins

After the tie-in spools have been completed, the complete pipeline system will be subjected to a hydrostatic leak test. The pipeline commissioning and dewatering/oil introduction is to be performed by Texas GulfLink operations.

Tank Storage Terminal Construction

Construction activities associated with the Texas GulfLink onshore storage terminal would be performed in accordance with Federal, State, and local regulations as well as the industry's best management practices (BMPs). Site boundaries would be identified and marked by a Texas licensed professional surveyor. Once the boundaries are identified, and prior to commencing construction activities, site erosion control measures would be implemented in accordance with a site-specific Storm Water Pollution Prevention Plan (SWPPP). The SWPPP would incorporate appropriate erosion controls, including silt fencing, hay bales, and dewatering structures in accordance with all State and Federal regulations. To ensure compliance with and effectiveness of the SWPPP measures, the implementation activities associated with the SWPPP would be inspected periodically by a third-party environmental contractor. Inspection reports would identify any program deficiencies and would report to TGL project management to oversee implementation of corrective actions.

A site drainage and flood protection plan would be implemented to protect the surrounding properties from adverse effects of the site during construction.

Areas intended for development would be cleared of topsoil and vegetation. Topsoil identified as appropriate for reuse would be segregated and used as needed onsite. The cleared vegetation would be properly disposed of in accordance with applicable Federal and State permit requirements.

Operating and construction access entrances to the Texas GulfLink onshore storage terminal would be constructed. Backfilling and compaction would be completed as necessary. All construction material, equipment, and spoil storage would be confined to specifically identified areas of the facility. Areas of the site containing wetlands and tree areas are not needed in the development of the facility. These areas would be identified and protected from construction activities through the use of temporary fencing and signage.

Excavation would be performed as necessary to accommodate the construction of tank foundations for each of the 13 tanks. Foundation designs would be finalized once soil borings are completed and results are analyzed. HDPE liner would be installed under the tank bottom, with leak detection sample ports and a cathodic protection anode system. Clean sand would be used to backfill the floor foundation.

Facility materials and equipment would be delivered to the sites via road access vehicles. Equipment would be offloaded and stored onsite, where it would then be installed and commissioned by the construction contractor. There would be secondary containment berm systems around the storage tanks designed per NFPA requirements. The berm outside all thirteen (13) storage tanks would be designed to SPCC requirements, and be capable of containing up to 100% to 110% of the capacity of one (1) storage tank and a 25-year, 24-hour storm water event, per the Department of Commerce Technical Paper No. 40. In addition, there would be intermediate berms located around each individual storage tank. These intermediate berms would be designed for a capacity of 10 percent of each storage tank's capacity. Storage tank placement and spacing would be in accordance with NFPA requirements.

Excavation would be performed to install the underground piping. Piping connections would be welded, flanged or screwed in accordance with the project piping specifications. Welder testing and inspection would be performed in accordance with CFR 49 §195, American Petroleum Institute Standard ("API") 1104, and American Society of Mechanical Engineers ("ASME") B31.4. Inspection and non-destructive testing of all welding activities would be performed using third-party American Welding Society (AWS) certified Welding Inspectors.

Above-ground piping, valves, and fittings would be blasted and coated in accordance with a project-specific coating specification using a three-part epoxy and urethane coating system.

Below-ground or submerged piping, valves, and fittings would be blasted and coated in accordance with a project-specific coating specification of below-ground pipeline facilities. Coating mixing, surface preparation and application inspection and non-destructive testing would be performed using third-party National Association of Corrosion Engineers (NACE) certified coating inspectors.

Hydrostatic testing of piping and related components would be conducted in accordance with ASME B31.4 section 437.4.1, Hydrostatic Testing of Internal Pressure. The test pressure for each pressure test conducted shall be maintained at least four continuous hours at a minimum pressure of 125 percent of the MAOP and buried pipe shall be tested for an additional four continuous hours at a pressure equal to 110 percent of the MAOP.

Upon completion of the piping hydrostatic test, piping would be dried using warm compressed dry nitrogen until the pipeline is void of water and moisture.

An existing freshwater well would provide hydrostatic test water for the tanks and associated piping components during the construction and operation of the facility. In order to conserve hydrostatic test water, efforts to have water stored, filtered, and reused would be considered. When necessary hydrostatic test water would be discharged into nearby Jones Creek in a controlled manner in accordance with the SWPPP and the NPDES permit through identified dewatering structures to prevent erosion and sedimentation.

The foundation for the office/control building would be excavated, formed, and concrete slab foundation poured on site.

Before being placed into service, controls, and safety equipment would be checked and tested for proper operation.

Vapor combustor units would not be permanently installed at the proposed Jones Creek Terminal but would be brought in to destroy VOC vapors during crude oil tank loading, maintenance, or inspection activities when the tank roof would be landed.

A firewater tank would be constructed and designed in accordance with ANSI/AWWA D103 – Bolted Steel Water Tanks, to contain up to the working capacity needed to respond to a tank seal fire. In the event of a fire, water from the firewater tank and foam system would be used to contain the seal fire. The firewater and foam system at the proposed Jones Creek Terminal would be designed in accordance with NFPA requirements.

Ancillary facilities at the Jones Creek Terminal would include an electrical substation providing electrical service to all systems at the Jones Creek Terminal and office building. The electrical substation would be powered via the existing electrical transmission line located adjacent to the Jones Creek Terminal site.

The entirety of this acreage would be surrounded by an 8-foot security fence and have perimeter video surveillance.

Onshore Pipeline Construction

In general, the onshore pipelines would be installed using different construction techniques. The primary installation method would consist of typical trenching based on a 30 ft. to 50 ft. right-of-way (ROW) in good soil condition as depicted by the image below. Prior to mobilizing piping to site, the ROW should be grubbed, cleared, and all landowners notified of the upcoming construction activities.

Matting for equipment would be required to minimize the damage of the natural soil. The trench would be excavated to a minimum of 1:1 slope, but may require more based on OSHA soil categorization. A “qualified individual” would determine the OSHA soil categorization and the corresponding soil sloping. Prior to any excavating commencing, a required one-call would be placed, requiring the excavator to wait on any other companies to mark pipelines or utilities. After the one-call time has been met (generally 72 hours), the project construction crew would probe the area to identify any other disturbances and the extent of the excavation. Hand digging would be required once the excavator is within one foot of any disturbance or identified foreign line. Once the trench has been excavated, a means of ingress/egress would be required based on OSHA standards. The pipelines would be welded on the top side, inspected per NDT requirements as described in this procedure, and laid in the trench using side booms in a maximum length as determined by the Construction Manager based on site conditions. Unless there is reason to believe that the excavated soil is hazardous, it should be used for backfill of the pipeline and compacted to 95% maximum dry density proctor test. It is permitted to use more stabilized backfill such as sand or hauled in fill if necessary. Flow fill or other cementous mixes are not allowed to touch the

pipeline as backfill due to affecting the cathodic protection of the system. After backfill has been completed, the project construction team shall restore the site conditions as best as possible to natural conditions.

Another construction installation method would be used for areas not accessible by standard construction equipment. This includes swampy and marshy areas. The determination to use this method would be made by the construction manager and would include a "ring levee". In this method, swamp-style excavators would create a levee using the natural soil, and the inside of the ring levee would be dewatered to allow access for trenching. Once the site has been dewatered, typical construction installation as described above would be utilized. Prior to mobilizing the project construction crew, more detailed procedures would describe the activities.

Other installation methods would include horizontal direction drilling and direct pipe installation. See attached HDD Execution Plan for utilizing HDD installation methods and ICWW Crossing Direct Pipe Installation Plan.

Pig launchers and receivers would be installed at the ends of each pipeline as a means to launch or receive a pipeline pig or sphere without shutting down the pipeline. All pig launchers, receivers, and their components would be designed to meet the same design criteria as the pipeline being served—except for closures, which are designed per pressure vessel code requirements. Pig launchers shall be installed in a horizontal plane or sloped as necessary to assist in meeting spacing, maintenance, or other considerations. Pig launchers and receivers would have pressure transmitters installed to aid in leak detection and operation. Pig launchers and receivers would be constructed and operated in accordance with the requirements of 49 CFR §195.

Main-line Block Valves (MLVs) would be installed in locations along the pipeline system that would minimize damage or pollution from accidental hazardous liquid discharges in accordance with 49 CFR §195. The MLVs would be located in fenced sites and secured from damage or tampering. The MLVs would be located such that the valves are accessible to authorized employees and protected from damage and tampering in accordance with Texas GulfLink standards and 49 CFR §195.

The new facilities would be constructed and operated in accordance with 49 CFR §195, Transportation of Hazardous Liquids by Pipeline, and applicable American Petroleum Institute (API), ASME, and National Fire Prevention Association (NFPA) standards.

For the proposed onshore pipeline routing see Volume II, Appendix D, Proposed Onshore Pipeline Routing.

For details on the proposed onshore horizontal directional drill (HDD) plans see, Volume II, Appendix C, Proposed HDD Execution Plan.

For the proposed offshore pipeline routing see Volume III, Appendix R, Offshore Survey Report.

For the construction schedule, see Volume V, Appendix E, Proposed Construction Schedule [**Confidential**].

Codes and Standards

During the design, fabrication, and installation of the Texas GulfLink Project, the following recognized codes and standards, but not limited to, may be utilized as the guidelines for the project:

Codes of Federal Regulations

Title 49 – Subchapter D Pipeline Safety

- Part 190, Pipeline Safety Enforcement and Regulatory Procedures
- Part 195, Transportation of Hazardous Liquids by Pipeline

Title 33 – Subchapter NN Deepwater Ports

- Part 149, Deepwater Ports: Design, Construction, and Equipment

Title 46 – Shipping

- Part 197, Commercial Diving Operations

American National Standards Institute

- ANSI B31.4 Liquid Petroleum Transportation Systems
- ANSI C1 National Electric Code (NEC)
- ANSI C2 National Electric Safety Code (NESC)

American Petroleum Institute

- API STD 1104 Standard for Welding Pipelines and Related Facilities
- API STD 1105 Construction Practices for Oil and Products Pipelines
- API RP 1110 Recommended Practice for the Pressure Testing of Liquid Petroleum Pipelines
- API RP 1111 Design, Construction, Operation and Maintenance of Offshore Hydrocarbon Pipeline
- API 5LW RP for Transportation of Line pipe on Barges and Marine Vessels
- API RP2A WSD Planning, Designing and Constructing Fixed Offshore Platforms Working Stress Design
- API RP2B Fabrication of Structural Steel Pipe
- API Pub 2026 Safe Access/Egress Involving Floating Roofs of Storage Tanks in Petroleum Service
- API RP 1162 Public Awareness Programs for Pipeline Operators
- API RP 1165 Recommended Practice for Pipeline SCADA Displays
- API RP 1168 Pipeline Control Room Management
- API RP 2003 Protection against Ignitions Arising out of Static, Lightning, and Stray Currents
- API RP 2350 Overfill Protection for Storage Tanks in Petroleum Facilities
- API Specification 5L Specification for Line Pipe
- API Specification 12F Specification for Shop Welded Tanks for Storage of Production Liquids
- API STD 510 Pressure Vessel Inspection Code: In-Service Inspection, Rating, Repair, and Alteration
- API STD 620 Design and Construction of Large, Welded, Low Pressure Storage Tanks,
- API STD 650 Welded Steel Tanks for Oil Storage
- API STD 653 Tank Inspection, Repair, Alteration, and Reconstruction
- API STD 2510 Design and Construction of LPG Installations
- API RP 14C Analysis, Design, and Testing of Safety Systems for Offshore Production Platforms
- API RP 14E Design and Installation of Offshore Production Platform Piping Systems
- API RP 14 J Design and Hazards Analysis for Offshore Production Facilities
- API RP 500 Classification of Locations for Electrical Installation at Petroleum Facilities
- API RP 520 Sizing, Selection and Installation of Pressure Relieving Devices
- API RP 521 Pressure Relieving and De-pressuring Systems

- API RP 1107 Recommended Pipeline Maintenance Welding Practices
- API RP 5LT RP for Truck Transportation of Line Pipe
- API RP 1130 Computational Pipeline Monitoring for Liquids: Pipeline Segment

National Fire Protection Association

- NFPA 70E Standard for Electrical Safety in the Work Place
- NFPA 30 Flammable and Combustible Liquids Code
- NFPA -70 2017 National Electrical Code (NEC)

American National Standards Institute/American Petroleum Institute

- ANSI/API RP 651 Cathodic Protection of Aboveground Petroleum Storage Tanks
- ANSI/API RP 652 Linings of Aboveground Petroleum Storage Tank Bottoms
- ANSI/API Specification 6D Specification for Pipeline Valves
- ANSI/API STD 2000 Venting Atmospheric and Low-pressure Storage Tanks

American Society of Mechanical Engineers/American National Standards Institute

- ASME/ANSI B16.9-2007 Factory-Made Wrought Butt-welding Fittings
- ASME/ANSI B31.4-2006 Pipeline Transportation Systems for Liquid Hydrocarbons and Other Liquids
- ASME Boiler & Pressure Vessel Code, Section VIII, Division 1 Rules for Construction of Pressure Vessels
- ASME Boiler & Pressure Vessel Code, Section VIII, Division 2 Alternate Rules, Rules for Construction of Pressure Vessels
- ASME Boiler & Pressure Vessel Code, Section IX: Qualification Standard for Welding and Brazing Procedures, Welders, Brazers, and Welding and Brazing Operators

American Society for Testing and Materials

- ASTM A106/A106M-10 Standard Specification for Seamless Carbon Steel Pipe for High Temperature Service
- ASTM A333/A333M-11 Standard Specification for Seamless and Welded Steel Pipe for Low-Temperature Service
- ASTM A53/A53M-10 Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
- ASTM A381-96 Standard Specification for Metal-Arc Welded Steel Pipe for Use with High Pressure Transmission Systems
- ASTM A671/A671M-10 Standard Specification for Electric-Fusion-Welded Steel Pipe for Atmospheric and Lower Temperatures
- ASTM A672/A672M-09 Standard Specification for Electric-Fusion-Welded Steel Pipe for High Pressure Service at Moderate Temperatures
- ASTM A691/A691M-09 Standard Specification for Carbon and Alloy Steel Pipe, Electric-Fusion-Welded for High Pressure Service at High Temperatures

Manufacturers Standardization Society

- MSS SP-75-2008 Standard Practice Specification for High-Test, Wrought, Butt Welding Fittings

National Association of Corrosion Engineers

- NACE RP 0490-2001 Corrosion Control Coatings for Field-Applied Liquids
- NACE SP0169-2007 Standard Practice Control of External Corrosion on Underground or Submerged Metallic Piping System
- NACE SP0102-2010 Standard Practice, In-line Inspection of Pipelines
- NACE SP0204-2008 Standard Practice, Stress Corrosion Cracking (SSC) Direct Assessment Methodology (DAM)

American Welding Society

- AWS D1.1 Structural Welding Code

Steel Structures Painting Council

- SSPC-PAZ Measurement of Dry Paint Thickness with Magnetic Gases
- SSPC-SP3 Power Tool Cleaning
- SSPC-SP5 Blast Cleaning to White
- SSPC-SP10 Blast Cleaning to Near White

American Bureau of Shipping

- ABS Rules for Building and Classing Facilities on Offshore Installations January 2014

International Marine Contractors Association

- IMCA International code of practice for offshore diving (IMCA D 014)

OSHA Safety and Health Standards

- Applicable OSHA Safety and Health Standards of the U.S. Department of Labor.

33 CFR §148.105(x) Operations Manual

A draft of the operations manual for the proposed port, containing the information under §150.15 of this chapter, must demonstrate the applicant's ability to operate the port safely and effectively. To the extent that circumstances are similar, this demonstration can be in the form of evidence appended to the draft operations manual of the applicant's participation in the safe and effective management or operation of other offshore facilities, for example, evidence of compliance with the Bureau of Ocean Energy Management (BOEM) requirements for those facilities. If the information required for the manual is not available, state why it is not and when it will be available.

A draft copy of the TGL Operations Manual for the proposed TGL DWP is included in Volume IV, Appendix D, TGL Operations Manual [**Confidential**]. A draft copy of the Table of Contents for the TGL Operations Manual is included below. Prior to commencement of operations, the final version of the TGL Operations Manual will be submitted to the USCG for approval.

The following proposed draft documents are also included in Volume IV [**Confidential**].

- Hazardous Liquid Pipeline Operations, Maintenance, and Emergency Response Manual – Appendix I
- Hazardous Liquid Pipeline Integrity Management Program Manual – Appendix J
- Pipeline Public Awareness Program – Appendix K
- US DOT and PHMSA Anti-Drug and Alcohol Misuse Prevention Plan – Appendix L
- Operator Qualification Program – Appendix M
- Control Room Management Manual – Appendix N
- Health, Safety & Environmental Manual – Appendix O
- Facility Security Plan – As required prior to operations
- Facility Response Plan – As required prior to operations

The Operations Manual Table of Contents is as follows:

DRAFT Operations Manual Table of Contents

33 CFR §148.105(y) Risk and Consequence Assessment

Data to support an independent, site-specific analysis to assess the risks and consequences of accidental and intentional events that compromise cargo containment. At minimum, potential events that result in liquefied natural gas or oil spill, vapor dispersion and/or fire will be analyzed. The Coast Guard will utilize validated models, for example computational fluid dynamics or an equivalent model. The applicant may consult with Commandant (CG-5) to ensure that appropriate assessment procedures are used.

Texas GulfLink contracted with The Response Group to provide a Risk and Consequence Assessment; Oil Discharge Modeling; Tactical Response Plan to support TGL's application for a license to construct and operate a crude oil deepwater port (DWP) in the Gulf of Mexico, South of Freeport, Texas. The DWP Marine Terminal will be served by a 42-inch diameter submarine pipeline and a buried terrestrial pipeline which will only operate in the export mode. The pipeline will be fed crude oil from two sources: the TGL onshore oil terminal at Jones Creek, Texas, and the Strategic Petroleum Reserve (SPR) facility at Freeport, Texas. The SPR line will be a 36-inch line connecting to the main pipeline. Segments of the pipeline will be isolated by manually-operated block valves. The crude oil being transported is a West Texas Intermediate with a high API and low specific gravity. It is characterized as a Group 1, Non-Persistent Oil, which means that upon discharge into the environment, it will evaporate quickly, will dissolve into the water column in a subsea event, and will not persist in the environment.

The risk assessment examined the probability of several types of failures and damage incidents which might cause severe oil discharges. Incident scenarios and failure types were contemplated for both the offshore portion of the DWP pipeline and the onshore portion. Worst case discharge (WCD) volumes were calculated for the offshore segment of the pipeline from the shoreline to the vessel, using Department of Interior, Bureau of Safety and Environmental Enforcement (BSEE) method described in 30, Code of Federal Regulation, Part 254.47 (30 CFR §254.47). Onshore WCD volumes were based on PHMSA methods.

Using these WCDs, The Response Group (TRG) completed oil discharge models for five locations, two in the offshore pipeline segment and three in the inland pipeline segments. The offshore models were run at a location midway between the shoreline and the platform structure and one mile from shoreline. The midway location provided a discharge volume that was slightly less than the WCD. The WCD volume for this pipeline segment was close to the shore. The midway location was added to provide for a greater shoreline impact result and to provide models for damage scenarios that might not occur in the nearshore location.

All of the oil discharge models can be found in Volume II, Appendix I, Texas GulfLink Consolidated Trajectories, and Appendix J, Oil Spill Modelling Report. Each model run contains information on the location and discharge amount. A model was run for the offshore locations for each month of the year to capture weather, tide, and current variations. Monthly model runs also have significance with respect to environmental impacts, since some species are present only at certain times of the year (like migratory birds or sea turtles). Each model run has a mass balance which quantifies the amount of oil dispersing into the water column, evaporating, remaining on the surface, and impacting shoreline. These change with variations in weather, based on monthly historical data.

Environmental and socio-economic impacts are captured in Volume II, Appendix K, TGLP Oil Spill Consequence Report for Inland Worst-Case Discharges; and Volume II, Appendix L, TGLP Oil Spill Consequence Report for Offshore Worst-Case Discharges. Emphasis is on environmental impacts and

species at risk. This report also identifies areas of impact to human use (recreation, tourism for the most part).

Volume III, Appendix H, Reports of Risks and Consequences contains an evaluation on risks and consequences of various incidents. Risk is examined as a probability of the occurrence of damage to the pipeline from several causes (corrosion, vessel damage, intentional damage, etc.) factored with a measure of consequence. It is assumed for the purposes of the risk analysis that all consequences would be significant and substantial.

TRG has also provided a draft Tactical Response Plan found in Volume II, Appendix M. This plan is based on the modeling information and the Texas GLO Geographic Response Plan (GRP) for the impacted areas. This plan depicts digital photos of the areas impacted in the models. Each area is divided into geographic divisions (as per Incident Command System organizational concepts). Each division depicts the response tactics recommended by Texas GLO for the habitat and geomorphology (sand, mud, wetland, pond, offshore). The Tactical Response Plan is only intended to be current for the first 24 to 48 hours, since conditions will change over time. It is intended that this Tactical Response Plan will form the basis for the initial formulation of an Incident Action Plan prepared by the Unified Command (ICS forms 204).

The risks and consequences of a discharge of the transported crude oil with respect to vapor dispersion and/or fire can be roughly determined using the EPA's CAMEO ALOHA air modeling program to develop threat zones for vapor spread and concentrations of oil components and flammable limits expressed as threat zones. Inputs to the air model may be developed for any particular scenario using the Safety Data Sheet in Volume II, Appendix H, and the volume of oil discharged, location, and meteorological data for any specific scenario. Since the models are dependent on so many ephemeral data inputs, it would be difficult to determine one particular sample of a model that would fit all circumstances.

33 CFR §148.105(z) Environmental Evaluation

An analysis, sufficient to meet the requirements of the National Environmental Policy Act, and as outlined in subpart G of this part, of the potential impacts on the natural and human environments, including sufficient information that complies with all applicable Federal, tribal, and State requirements for the protection of the environment.

Texas GulfLink prepared an Environmental Evaluation of the proposed Texas GulfLink Deepwater Port (DWP) Project ("Project") as part of the DWP license application. The complete Environmental Evaluation for the Project is located in Volume III of the application. Volume III provides an evaluation of the affected environment, alternatives considered, and an assessment of impacts associated with implementation of the proposed Project. Volume III assesses the potential environmental effects associated with construction, routine operations, potential upsets/accidents, and decommissioning of the proposed Project.

This document has been prepared in anticipation of compliance with National Environmental Policy Act (NEPA) requirements, the Council on Environmental Quality (CEQ) regulations for implementing the NEPA (40 CFR §1500-1508), U.S. Department of Transportation Order 5610.1C (Procedures for Considering Environmental Impacts), and US Coast Guard policies. For this Environmental Evaluation, Texas GulfLink also considered applicable Federal and State laws and statutes to comply with 33 CFR §148.737 of the 1974 Deepwater Port Act (DWPA).

Report Organization

The Environmental Assessment includes evaluations of twelve (12) social and environmental resource categories as well as a list of preparers of the environmental evaluation and all applicable appendices. The complete Environmental Assessment is provided in Volume III. A summary is provided in the following paragraphs.

Section 1 – Introduction

Texas GulfLink plans to develop a deepwater crude oil export terminal, located near Freeport, Texas, in Brazoria County. The Texas GulfLink Project would provide critical infrastructure to the Houston market to clear over-supplied crude oil volumes from West Texas and the Midcontinent. As United States crude oil exports continue to increase, critical infrastructure along the Gulf Coast will be necessary to provide an efficient, secure, and safe solution for large-scale exporting to international markets. The completed facility would be capable of fully loading Very Large Crude Carrier (VLCC) vessels for the purpose of exporting crude oil to international markets.

The Deepwater Port would receive crude oil via an onshore crude pipeline from above-ground crude oil storage tanks. Upon nomination from the crude oil shipper, the oil would be transported to one of two floating Single Point Mooring (SPM) buoys in the Gulf of Mexico, approximately 28.3 nautical miles offshore, via a 42-inch pipeline. The SPM buoys would allow for VLCC vessels to moor and receive up to 2 million barrels of crude to be transported internationally. A manned offshore platform, equipped with around-the-clock port monitoring, custody transfer metering, and surge relief would provide assurance that shippers' commercial risks are mitigated and that the port is protected from security threats and environmental risks.

Section 2 – Purpose and Need

The purpose of the Texas GulfLink Project is to provide an offshore DWP facility and the related infrastructure capable of transporting crude oil internationally via VLCC vessels. This would be accomplished through the construction and operation of the proposed Texas GulfLink Project consisting of shore-based crude oil storage tanks, a 42" pipeline connecting the onshore storage facility to the offshore loading facility, a fully-manned offshore platform, and two single point mooring buoys to accommodate deep draft tankers that can export US-produced crude oil to international markets.

Section 3 – Alternatives Analysis

Prior to initiating the application process, Texas GulfLink started a regional screening analysis which determined the Freeport, Texas, area as the best suited location for the proposed Project. The next level of screening consisted of potential offshore, onshore, and a combination of onshore and offshore alternatives to support the growth of crude oil exports. Texas GulfLink then commissioned and contributed to an Alternatives Analysis that included the evaluation of several different locations for the proposed project components. This analysis also considered not constructing the Project ("no action").

No Action

Under the no action alternative, it is likely that onshore loading of smaller crude oil carriers for lightering operations would need to be expanded, resulting in more dredging and dock construction projects along the Gulf Coast and the dredging of deep-draft ports to accommodate VLCCs, each activity resulting in environmental and socioeconomic impacts from dredging, construction, and crude oil storage and transfer operations. For example, calculations indicate that by implementing the proposed Texas GulfLink Deepwater Port Project, approximately 2,750 tons per year of VOC emissions and approximately 2,140 tons per year of NOx emissions will be reduced due to reduced lightering operations in the GOM. Considering all of these factors, Texas GulfLink feels that the no action alternative does not represent a feasible option.

Proposed Action

The proposed action is the construction of a Deepwater Oil Port near Freeport, Texas, capable of loading deep draft VLCC vessels and the associated transportation infrastructure and on-shore storage terminal. Texas GulfLink determined that there is a need for this project and evaluated offshore structure alternative locations, pipeline routes, and tracts. After performing the alternatives analysis (see Volume III for more details), the proposed onshore and offshore locations described in Section 1, above, represent a preferred Project location and design option that serves as the basis for the determination of impacts to environmental resources that result from construction, operation, and decommissioning of the proposed Project.

Section 4 – Air Quality

For the proposed Project, Air Quality analyses were performed to ensure air pollutant emissions from both the onshore Jones Creek Crude Storage Facility and the offshore Deepwater Port Facility would not produce significant impacts on the air quality of the region. The analyses involved reviewing Federal and State (Texas) air quality regulations potentially applicable to the Project, the existing (pre-Project) environment where the Project would be located, potential environmental impacts (consequences) of the proposed Project, cumulative impacts of the Project to the local area, and finally environmental mitigation options.

As described in more detail in Volume III of this DWP license application, the onshore Jones Creek Crude Storage Facility would be a minor stationary source of air pollution, and site-wide emissions from its routine operation will have an insignificant impact on the air quality in the vicinity. Additionally, the estimated temporary and local emissions from constructing and decommissioning the onshore facility are anticipated to have no significant impact on air quality.

The offshore Deepwater Port Facility would be a major source of air pollution for only two pollutants, VOC and NOx. Air Quality impacts analyses for the DWP Facility operation show that all emitted pollutants would not exceed their respective National Ambient Air Quality Standards (NAAQS), emissions of NOx and VOC (the two precursor pollutants for ground-level ozone formation) would not cause a significant increase in ozone levels in the area, and conservative (Level 1) visibility screening shows that there would be no impairment to visibility at the nearest Class II area (San Bernard Wildlife Refuge). A Class I area impacts analysis was not required because the nearest Class I area (Breton National Wildlife Refuge in southeast Louisiana) is too far away to trigger such an impacts analysis. The estimated temporary and local emissions from constructing and decommissioning the offshore facility are anticipated to have no significant impact on air quality.

Finally, mitigation options were considered with respect to the estimated air pollutant emission increases associated with the proposed Project. Impacts of construction-related emissions to air quality are expected to be minor, local, and temporary. These emissions would cease at the end of construction and beginning of project startup. During onshore site construction, exhaust emissions from diesel- and gasoline-fueled construction equipment and vehicle engines would be minimized by Federal design standards imposed at the time of manufacture of the engines, and would comply with EPA mobile and non-road emission regulations at 40 CFR Parts 85, 86, and 89. Emissions would also be controlled by purchasing commercial gasoline and diesel fuel products. Contractors and employees would be encouraged to minimize vehicle and equipment idling time to the extent practical during construction activities. Finally, fugitive dust emissions generated by excavation and vehicle traffic on unpaved surfaces would be reduced by dust suppression techniques such as application of water spray to roadways, as needed.

Storage tanks proposed for the onshore terminal would be equipped with a floating roof with each roof opening equipped with a gasket and seals. A portable vapor combustion unit (VCU) would be available to control the VOC emissions generated during ventilation and cleaning of a tank in preparation for API 653. The VCU would have a VOC vapor destruction efficiency of at least 99%.

Section 5 – Meteorology

The meteorological conditions of the proposed Project are discussed in Section 5 of Volume III. The general climatology and meteorology of the US Gulf Coast, and the Texas Gulf Coast, in particular, and the effects of fixed bottom offshore structures to existing wave and current fields are addressed. The potential impacts were determined for the construction, operation, and decommissioning phases of the Project.

General Climatology & Meteorology

The US Gulf Coast is characterized by a humid, subtropical climate which translates into long, hot summers with rainfall concentrated in the warmest months, and short, mild winters with infrequent frosts. Subtropical climates have 8 or more months with a mean temperature of 10 °C (50 °F) or higher and 1 month with a mean temperature under 18 °C (64.4 °F). The humid summers usually bring frequent tropical downpours of short duration, and the winters are often dry, with most winter precipitation being frontal.

The Texas Gulf Coast

The expanse of Texas extends across a range of climate conditions and geographic regions. The Texas coast is divided into 10 climate divisions by the National Climatic Data Center; Freeport is located in Division 8 (Gulf Coastal Plains), subtropical humid marine prairies and marshes. The variability in its climate is due to complex interactions between location and geographic features, including seasonal airmasses such as: arctic fronts from Canada, subtropical West winds from the Pacific Ocean and northern Mexico, tropical cyclones or hurricanes from the Gulf of Mexico, the high-pressure system in the Atlantic Ocean known as the Bermuda High, and the movement of jet streams.

Effects of Fixed Bottom Offshore Structures to Existing Wave and Current Fields

Fixed offshore structures, such as oil and gas platforms and offshore wind farms (OWFs) may contribute to possible negative environmental impacts on the corresponding marine environment (e.g., the undesirable effects on the local wave climate, changes in sediment transport patterns, loss of biodiversity, etc.) The proposed offshore structure, like most modern OWFs, are located in relatively shallow water depths and at relatively small distances from the shore.

From this study, when examining all examined incident regular and irregular wave cases with incident angles equal to 0 deg, the existence of the structure leads to limited shadowing in the area behind the structure, while significant scattering effects occur only in the wave field upstream. Therefore, the impact of the structure on the surrounding wave field is more pronounced in the area in front of the structure and among adjacent structures.

Section 6 – Noise

The potential impacts of the Project on noise levels for both the offshore and onshore environments are presented in Volume III, Section 6. For the offshore environment, an acoustic environmental baseline study (EBS) was conducted on March 21 and 22, 2019 to characterize the soundscape of the survey area. For the onshore environment, a desktop review was conducted to identify noise sensitive areas (NSAs) in the proposed project area. NSAs that were searched for included medical facilities, churches, parks, schools, and residences. A 0.5-mile buffer around the proposed Jones Creek Terminal area and a 0.25-mile buffer around the Onshore Pipeline System were reviewed. Potential offshore impacts from construction, operation, and decommissioning range from low to medium.

Noise levels may temporarily increase due to construction at the Jones Creek Terminal site, the open-cut trenching sites, and the temporary HDD entry/exit sites. Mitigation measures may be taken at these sites to absorb and reduce noise impacts to the Justin Hurst WMA to acceptable levels. Noise impacts from the operation of the Jones Creek Terminal and Onshore Pipeline System will range from none to moderate.

Section 7 – Biological Resources

The potential environmental consequences of the Project on the following factors of biological resources are discussed in terms of offshore and onshore habitats in reference to the construction, operation, upsets and accidents, and decommissioning project phases within Volume III, Section 7. The offshore habitats consist of soft and hard bottoms, threatened and endangered species, and non-listed species. The onshore habitats are Texas Gulf Coast Prairie Habitat, Justin Hurst Wildlife Management Area, threatened and endangered species, and other habitat features.

The potential offshore impacts during installation of the offshore pipeline and deepwater port to soft and hard bottom habitats, including marine and coastal birds, range from no impact to negligible to low. The

overall seafloor disturbance will be short-term for installation and consist of mostly soft bottom disturbances. The operational activities are limited to marine and coastal birds from operational noise, vessel movements, and helicopter traffic with impact potential ranging from negligible to low.
Two spill scenarios were developed representing a small and large release to address upsets and accidents for each offshore habitat. The small spill scenario potential is negligible, with the large spill scenario potential as high. Decommissioning activities relating to offshore range from negligible to low.

Potential onshore impacts arising from activities due to construction activities such as vegetative clearing, grading, and excavating range from none to moderate. Activities associated with operations, upsets and accidents, and decommissioning are expected to range from none to negligible.

Section 8 – Threatened Endangered and Protected Species

The potential environmental consequences of the construction, operation, and decommissioning of the Project on threatened and endangered species is presented for both offshore and onshore habitats in Section 8 of Volume III. The following resources addressed included Sea Turtles and Marine Mammals, offshore and Terrestrial and Coastal Birds, Mammals, Mollusks, Reptiles, and Migratory Birds onshore.

Impacts arising from activities due to construction activities such as vegetative clearing, grading, and excavating range from none to moderate. Activities associated with operations, upsets and accidents, and decommissioning are expected to range from none to negligible.

Section 9 – Essential Fish Habitat

The potential environmental consequences of the proposed Project on the following factors of Essential Fish Habitat and Commercial Fisheries are discussed in terms of offshore and onshore habitats in reference to construction, operational, and decommissioning project phases. The offshore region extends from the coastline to open water and the onshore includes all landward water bodies from the coastline within the project area. The information contained in this summary is found in Section 9 of Volume III. Resources addressed are Commercial Fisheries, Recreational Fisheries, Managed Species, and Essential Fish Habitat.

Impacts arising from construction activities such as pipeline trenching and placement of temporary fill range from negligible to low. Operation impacts are low, upset and accident impacts range from low to medium, and decommissioning impacts range from negligible to low.

Section 10 – Cultural Resources

The proposed Project would include ground-disturbing activities which have the potential to impact cultural resources, if present. Prior to any construction activities, Texas GulfLink will commission a Phase I cultural resources investigation in undisturbed portions of the areas of potential effect (APE). Volume III, Section 10 includes a summary of the desktop evaluation that was performed, and the full report is included as an appendix to Volume III. Within the entire onshore APE, undisturbed areas have the potential to contain intact, unrecorded cultural resources, although the probability of encountering cultural resources in the APE is generally low (with a few exceptions). Two shipwreck points (Stingray and Patroon) are depicted in the Texas Archeological Sites Atlas (TASA) data within the offshore study area; however, HDD will be used for pipeline installation within the southernmost 5,575 ft of the Project area, and the potential for impacting these shipwrecks during pipeline installation via HDD is negligible.

Section 11 – Surface Water and Sediments

The potential environmental consequences of the Project on offshore water and sediment quality and onshore groundwater and surface water resources due to the construction, operation, and decommissioning of the Project, are negligible. The information contained in this summary can be found in Volume III, Section 11.

Impacts to water and sediment quality from construction, operation, and decommissioning of the Project are expected to be localized and negligible. Increased turbidity and sedimentation are possible impacts resulting from the installation of the marine pipelines, platforms, and SPM equipment, but the conditions are expected to be temporary and return to normal once activities complete. Decommissioning would result in negligible, localized, short-term impacts to water quality, but would be expected to dissipate quickly once activities end.

Onshore water components do not pose any significant impact to existing groundwater or surface water resources. The construction of the onshore pipeline may impact wetlands and water quality through habitat modification and the inadvertent release of construction fluids during HDD activities, though these impacts are considered negligible to minor. The operation of the Onshore Storage Terminal is not expected to contribute to any long-term impacts, although the operation of the Onshore pipeline has the potential for long-term impacts relating to conversion of forested wetland to herbaceous wetland and routine maintenance of the right-of-way.

A summary of impacts and viable mitigation measures of the Offshore Water and Sediment Quality, Onshore Groundwater and Surface Water Resources is presented in Table 11-5 of Section 11. Impacts were evaluated for routine operations (i.e., construction, operation, decommissioning) and accidental events.

Section 12 – Wetlands, Waters of the US, and Floodplains

The potential environmental consequences of the construction, operation, and decommissioning of the TGL project on wetlands, waters of the US and floodplains are addressed in Section 12 of Volume III which addresses impacts to groundwater resources, surface water resources and wetlands.

Construction impacts to groundwater are temporal in nature and are not significant. Wetland impacts include permanent impacts during construction as well as temporary impacts. These impacts are addressed fully in Volume III, Section 12 as well as in Volume III Appendix A (Department of the Army Permit Application package). Surface water impacts will be minimized by implementing best management practices during construction and operation.

Section 13 – Coastal Zone Management and Land Use

The potential environmental consequences of the Project on the following factors of coastal zone management and land use are discussed in terms of onshore pipeline system and the Jones Creek Crude Storage Terminal only, as there is no offshore component to this section. The environmental consequences are evaluated against the construction, operational, and decommissioning phases of the Project. The onshore pipeline and Jones Creek Crude Storage Terminal would be located in rural areas partially within the jurisdiction of the City of Freeport and the Village of Jones Creek, in Brazoria County, Texas. The Project would be located entirely within the Texas coastal zone boundary of Brazoria County. The current land use is comprised mostly of herbaceous wetlands (onshore pipeline) and pasture/hay (Jones Creek Crude Storage Terminal). The information contained in this summary is found in Section 13

of Volume III. Factors considered were the Pipeline System, Jones Creek Crude Storage Terminal, Coastal Zone Management Area, Public Lands and Recreational Areas, and Residential Areas.

Potential impacts from construction ranges from negligible to significant. Impacts from operations range from negligible to significant except for a substantial impact to aesthetics due to presence of the Jones Creek Crude Storage Terminal. Potential impacts from upsets and accidents would be expected to be temporary and reversible. Decommissioning activities would be expected to range from negligible due to the Onshore Pipeline System and positive due to the Jones Creek Terminal.

Section 14 – Geological Resources

The potential environmental consequences of the Project on geological resources within the project area in reference to construction, operation, upsets and accidents, and decommissioning of the offshore and onshore components are reviewed in Volume III, Section 14.

No significant impacts are identified for the offshore soft and hard bottoms habitats. The onshore resources are the project boundary soils and associated geology. There are no significant impacts expected to the soils or to the geologic mineral resources.

Section 15 – Socioeconomics

The potential impacts due to construction, operation, and decommissioning of the TGL project on the socioeconomic and human community structure of Brazoria County and the offshore area seaward to the proposed platform were determined. Brazoria County is known for its inshore and offshore fishing, bird watching, camping, 23 miles of sandy beaches, chemical manufacturing, the petroleum industry, shipping, and recreational boating. Most of Brazoria County is rural although abundant growth is occurring, including in the city of Pearland and Port Freeport. Jones Creek is the nearest village to the Texas GulfLink Project, specifically the onshore crude oil storage facility is approximately 1-mile northwest of the village. Some residences located in the Village of Jones Creek will be adjacent to the onshore facility across Peach Point Road (less than 0.1 mile to the East). Socioeconomics and Human Community Structure are Population; Labor Force and Employment; Housing; Public Services including Medical Facilities, Police, Fire, Emergency Responders, US Coast Guard, and Schools; Taxes and Revenues; and Environmental Justice are addressed in Volume III, Section 15.

Potential impacts from construction activities range from no impact to a beneficial impact on job opportunities with exception of a short-term limited adverse impact to commercial fishing. Potential impacts from operations range from negligible to long-term positive impact on tax revenues. The impact of potential upsets and accidents are expected to be negligible due to the short duration and infrequent occurrence of incidents.

33 CFR §148.105(aa) Aids to Navigation

§148.105(aa)(1) Proposed Aids to Navigation

Table 4. Texas GulfLink Location Chart

TBS Ref	Description	Easting	Northing	Latitude-N	Longitude-W	Depth (ft)
	COMPONENTS					
	Platform	3,243,263.2	13,406,478.0	28°-33'08.98"	95°-01'42.35"	104
	SPM 1 (east)	3,250,074.6	13,403,117.8	28°-32'33.43"	95°-00'27.30"	106
	SPM 2 (south)	3,243,263.2	13,398,882.9	28°-31'53.82"	95°-01'45.24"	106
	SAFETY ZONE					
1	SZ NE corner, Buoy 4	3,263,199.0	13,413,433.5	28°-34'11.05"	94°-57'56.23"	104
2	SZ NW corner	3,243,263.2	13,413,433.5	28°-34'17.81"	95°-01'39.70"	103
3	SZ W corner, Buoy 5	3,226,710.9	13,402,800.3	28°-32'38.12"	95°-04'49.24"	104
4	SZ SW corner, Buoy 3	3,238,033.1	13,386,389.2	28°-29'51.95"	95°-02'48.58"	113
5	SZ SE corner, Buoy 1	3,269,275.1	13,386,389.2	28°-29'41.36"	94°-56'58.63"	116
6	SZ N entrance, Buoy 2	3,269,275.1	13,398,541.4	28°-31'41.61"	94°-56'53.91"	111
7	SZ inside corner	3,263,199.0	13,398,541.4	28°-31'43.69"	94°-58'01.99"	111
	SVC BUOYS					
23	Svc Buoy 1	3,252,187.8	13,412,544.4	28°-34'06.00"	95°-00"00.00"	103
24	Svc Buoy 2	3,236,311.5	13,407,153.9	28°-33'18.00"	95°-00'03.00"	103
	ANCHORAGE AREA					
1	NW corner	3,270,878.0	13,382,029.9	28°-28'57.68"	94°-56'42.37"	119
2	NE corner	3,295,182.5	13,382,029.9	28°-28'49.26"	94°-52'10.18"	121
3	SE corner	3,295,182.5	13,369,877.7	28°-26'49.01"	94°-52'14.99	126
4	SW corner	3,270,878.0	13,369,877.7	28°-26'57.43"	94°-56'47.09"	127
	SAFETY APPROACH FAIRWAY					
6	NW corner, Buoy 2	3,269,275.1	13,398,541.4	28°-31'41.61"	94°-56'53.91"	111
5	SW corner, Buoy 1	3,269,275.1	13,386,389.2	28°-29'41.36"	94°-56'58.63"	116
9	SE corner	3,297.026.6	13,386,389.2	28°-29'-31.75"	94°-51'47.80"	119
8	NE corner	3,285,101.7	13,398,541.4	28°-31'36.15"	94°-53'56.59"	113

Description	Lease Blocks
PLATFORM	GA 423
SPM 1	GA 423
SPM 2	GA A 36
SAFETY ZONE	GA A 36, GA A 37, GA 422, GA 423, GA 424, GA 425
APPROACH SAFETY FAIRWAY	GA A 38, GA A 39
ANCHORAGE	GA A 52, GA A 53
PIPELINE (federal blocks)	GA 362, 363, 380, 381, 391, 392, 393, 422, 423, BA 342, 364, GA A 36
PIPELINE (state blocks)	BA 308, 336, 341, 342, 392, 396, 403, 413,

Description of Area	Controlling Depth	Note
Texas GulfLink Safety Zone	104 ft	Svc Buoys delineate 103 depth
Approach Safety Fairway	107 ft	AWOIS dragged to 108 ft
Anchorage Area	118 ft	Outside of Safety Zone

Platform Identification

Placards will be mounted on the platform to display the name of the deepwater port and the name or number identifying the structure, as per 33CFR§149.570, so that the information is visible:

- From the water at all angles of approach to the structure; and
- From aircraft on approach on the Helicopter Pad
- At least 12 inches high, in vertical block style; and Displayed against a contrasting background.

Platform RADAR Beacon

An FCC-accepted RACON radar beacon (RACON) will be located on the Metering Platform tower as per 33 CFR §149.580.

The RACON must transmit:

- In both 2900–3100 MHz and 9300– 9500 MHz frequency bands; or
- Transmit a signal of at least 250 milliwatts radiated power that is omni- directional and polarized in the horizontal plane;
- Transmit a two-element or more Morse code character, the length of which does not exceed 25 percent of the radar range expected to be used by vessels operating in the area;
- If of the frequency agile type, be programmed so that it will respond at least 40 percent of the time, but not more than 90 percent of the time, with a response-time duration of at least 24 seconds; and
- Will be located at a minimum height of 15 ft. above the highest deck of the platform and where the structure of the platform, or equipment mounted on the platform, does not obstruct the signal propagation in any direction.

The 33 CFR §67.10-10 operating requirements will be met as the Vessel Traffic Controller will be on duty 24-hours per day and be responsible for activating the signal whenever visibility is less than 5 nm in any direction and securing the signal when required. Sound signal tests will be conducted as per 33 CFR §67.10-20 (Sound Signal Tests) in the presence of a Coast Guard representative, who certifies the test if the procedures comply with the requirements of this section. Texas GulfLink will follow the requirements of §67.10-25 when submitting an application for the sound tests.

Hose String Lights

The hose strings will be marked at each end with a light on the pick-up float, flashing yellow, 50-70 times per minute, visible all around the horizon for 2 miles, 1 meter above the water.

§148.105(aa)(2) Obstruction Lights and Rotating Beacons

Platform Obstruction Lights

Both of the Texas GulfLink platforms, in the platform complex, will be fitted with obstruction lights on each corner, each light to have a 360° lens, and all lights shall be operated to flash in unison.

- The lights will be visible at a distance of at least five nautical miles.
- The lights shall be displayed not less than 20 ft. above mean high water
- The lights shall all be mounted on the same horizontal plane within the limitations of height specified in 33 CFR §67.20-5, §67.25-5, or §67.30-5, as applicable.

- All obstruction lights shall be installed in a manner which will permit at least one of them to be carried in sight of the mariner, regardless of the angle of approach, until the mariner is within 50 ft. of the structure, visibility permitting.
- All obstruction lights will be powered from a reliable power source, including auxiliary power sources. They shall display a white quick-flash characteristic of approximately 60 flashes per minute.
- Obstruction lights shall be displayed at all times between the hours of sunset and sunrise, local time, commencing at the time the construction of a structure is begun.
- During construction and until such time as a platform capable of supporting the obstruction lights is completed, the fixed lights on an attending vessel shall be used. In addition, when lights are in use for general illumination to facilitate the construction or operation of a structure, and can be seen from any angle of approach at a distance equal to that prescribed for the obstruction lights for the class of structure, the actual operation of obstruction lights also will not be required.

Platform Rotating Beacon

In addition to obstruction lights, the Metering Platform will have a lit rotating beacon that distinguishes the deepwater port from other surrounding offshore structures as per 33 CFR §149.555. (additional specs will be provided)

- Have an effective intensity of at least 15,000 candela;
- Flash a white light at least once every 20 seconds;
- Operate in wind speeds of up to 100 knots at a rotation rate that is within 6 percent of the operating speed displayed on the beacon;
- Have one or more leveling indicators permanently attached to the light, each with an accuracy of ±0.25 ° or better; and
- Located: At least 60 ft. (about 18.3 meters) above mean high water, not obstructed in any direction, visible all around the horizon.

§148.105(aa)(3) Sound Signal

The GulfLink platform complex will have a sound signal, approved under subpart 67.10 of this chapter, that has a 2-mile range as per 33 CFR §149.585.

- Located at least 10 feet, but not more than 150 feet, above mean high water, unobstructed
- Have its maximum intensity at a frequency between 100 and 1,100 Hertz;
- Sound a 2-second blast every 20 seconds (2 seconds sound, 18 seconds silence)
- Have the rated range required by §67.20-10, §67.25-10, or §67.30-10;
- Have a height not exceeding 25 feet;
- Have not more than eight sound sources;
- Approved by the Coast Guard under §67.10-15; and be permanently marked with:
    (1) The date of Coast Guard approval;
    (2) The manufacturer and date of manufacture;
    (3) A model designation;
    (4) The approved range; and
    (5) The power necessary to comply with the provisions of paragraph (c) of this section

§148.105(aa)(4) Each Proposed Buoy

Table 8. Proposed Buoy Locations

Description	Name	Depth	Latitude	Longitude	Characteristic	Height	Range	Structure	Remarks
Safety Zone Boundary	GulfLink Fairway Lighted Buoy 1	116 ft	28-29'41" N	094-56'59" W	Fl G 6s	12	75c	Pillar Green	Radar Reflector 2nm Private Aid HORN 0.5nm
	GulfLink Fairway Lighted Buoy 2	111 ft	28-31'42" N	094-56'54" W	Fl R 6s	12	75c	Pillar Red	Radar Reflector 2nm Private Aid
	GulfLink Fairway Lighted Buoy 3	113 ft	28-29'52" N	095-02'49" W	Fl G 6s	12	75c	Pillar Green	Radar Reflector 2nm Private Aid
	GulfLink Fairway Lighted Buoy 4	104 ft	28-43'11" N	094-57'56" W	Fl R 6s	12	75c	Pillar Red	Radar Reflector 2nm Private Aid
	GulfLink Fairway Lighted Buoy 5	104 ft	28-32'38" N	095-04'49" W	Fl G 6s	12	75c	Pillar Green	Radar Reflector 2nm Private Aid
SPM 1	GulfLink Lighted Mooring "TGL 1"	106 ft	28-32'33" N	095-00'27" W	Q W	15	5	yellow	Private Aid Placard "Texas GulfLink SPM 1"
SPM 2	GulfLink Lighted Mooring "TGL 2"	106 ft	28-31'54" N	095-01'45" W	Q W	15	5	Yellow	Private Aid Placard "Texas GulfLink SPM 2"
Hose String	SPM Hoses (4)				Q Y	4	2	Orange Float	Hose End Float 50-70 per min
Service Mooring Buoys	GulfLink Lighted Mooring Buoy SVC-1	103 ft	28-34'00" N	095-00'00" W	Fl W 4s	8		White	Radar Reflector Private Aid
	GulfLink Lighted	103 ft	28-33'00" N	095-03'00" W	Fl W 4s	8		White	Radar Reflector

	Mooring Buoy SVC-2								Private Aid
Marine Terminal Platform	GulfLink Platform Complex	104 ft	28-33'09" N	095-01'42" W		165		on platform	RACON: G(–··) HORN 2s (20s)
	(8) Obstruction Lights				Q W 1s	90	5		Outboard Corners flash in Unison
	Rotating Beacon				Fl W 15s	165	15,000c		On Tower

As per 33 CFR §66.01-5 GulfLink will submit an application for approval, to the USCG, for all the above listed private aids to Navigation at least 180 days before the installation of any structure at the Texas GulfLink Deepwater Port. As per 33 CFR §66.01-5 Texas GulfLink will submit an application for approval, to the USCG, for all the above-listed private aids to Navigation at least 180 days before the installation of any structure at the Texas GulfLink Deepwater Port.

CALM Buoy Obstruction Lights

Obstruction lights will be fitted on the CALM mooring buoy as per 33 CFR §149.540 and located at least 10 ft above mean high water.

CALM Buoy Identifying Placard

The SPMs will have identifying placards mounted to indicate the number of the SPM.

Navigation Buoys defining Safety Zone

Five (5) privately-maintained navigational spar buoys will be provided to define the limits of the proposed Safety Zone. The buoys will have RADAR reflectors, day marks, lights FL 6s G or R, 15ft height. Buoy 1 will have a horn sound signal with a range of .5nm.

§148.105(aa)(5) RADAR Beacon (RACON)

Marine Terminal Platform

GulfLink Platform Complex

An FCC-accepted RACON RADAR beacon (RACON) will be located on the *Metering Platform* tower as per 33 CFR §149.580 at 130ft height and a Radiated power of 600 milliwatts, 15nm Range.

The RACON must transmit:

- In both 2900–3100 MHz and 9300– 9500 MHz frequency bands; or
- Transmit a signal of at least 250 milliwatts radiated power that is omni- directional and polarized in the horizontal plane;
- Transmit a two-element or more Morse code character, the length of which does not exceed 25 percent of the radar range expected to be used by vessels operating in the area;
- If of the frequency agile type, be programmed so that it will respond at least 40 percent of the time, but not more than 90 percent of the time, with a response-time duration of at least 24 seconds; and

- Will be located at a minimum height of 20 ft. above the highest deck of the platform and where the structure of the platform, or equipment mounted on the platform, does not obstruct the signal propagation in any direction.

33 CFR §148.105(bb) National Pollutant Discharge Elimination System

Section 402 of the Clean Water Act (CWA) requires all construction sites on an acre or greater of land, as well as municipal, industrial, and commercial facilities discharging wastewater or stormwater to waters of the U.S. require to obtain authorization to discharge storm water and wastewaters through the National Pollutant Discharge Elimination System (NPDES) permitting system. The State of Texas has a unique permitting environment in that three separate entities, including the United States Environmental Protection Agency (US EPA), the Texas Railroad Commission (RRC), and the Texas Commission on Environmental Quality (TCEQ) have jurisdiction over water discharge permitting activities.

The TCEQ has been delegated authority to administer the NPDES system within the State of Texas. The Texas RRC has been granted jurisdiction over oil transportation and storage within the State of Texas. However, the Texas RRC has not been delegated authority to issue NPDES permits for these type facilities. Therefore, the US EPA will be the permitting authority who issues and administers NPDES permits for the facility, including construction general permits and operational permits for the onshore portions of the Texas GulfLink Deepwater Port Project.

Offshore discharges, including hydrostatic discharges and stormwater or wastewater discharges, that would occur at the Texas GulfLink Deepwater Port Facility would be covered under a separate individual permit also issued by the US EPA. The US EPA has NPDES permitting jurisdiction for the offshore portion because the proposed discharges will occur outside of the territorial waters of the State of Texas (greater than 9 nautical miles), but within federal waters (less than 200 nautical miles).

Volume III, Section 11 of this Deepwater Port license application provides more detail on the NPDES permit applications developed for the Texas GulfLink Project.

33 CFR §148.105(cc) Placement of Structures and the Discharge of Dredged or Fill Material

The US Army Corps of Engineers (USACE) regulates placement of dredge and fill within Waters of the US under Section 10 of the US Rivers and Harbors Act of 1899, Section 404 of the Clean Water Act (CWA), Section 103 of the Marine Protection, Research, and Sanctuaries Act, and Section 4(f) of the Outer Continental Shelf Lands Act (OCSLA). §148.105(cc) requires that Texas GulfLink provide all information necessary to obtain a Department of the Army Permit for the Texas GulfLink Terminal Project.

The Project will require placement of dredge and fill materials into Waters of the US; therefore, construction and operation of the following project components will require a Section 404/10 permit:

- Construction and operation of the proposed Jones Creek Terminal would require permanent fill placement in wetlands and Waters of the US.
- Construction of the 42-inch and 36-inch pipelines would require temporary excavation and temporary placement of excavated material in wetlands and Waters of the US. Following construction, the temporary excavation would be backfilled, and all pre-project conditions restored. No permanent fill placement is anticipated for the operation of the pipelines.
- Construction and operation of the Texas GulfLink Deepwater Port (DWP) in the Gulf of Mexico.
- The proposed Project is located within the USACE Galveston District. As such, Texas GulfLink has prepared a draft Section 404/10 permit application (see Volume III, Appendix A) requesting authorization for the proposed Project components regulated under the jurisdiction of the USACE requesting authorization for Project components regulated under Section 404 of the CWA and Section 10 of the Rivers and Harbors Act.

33 CFR §148.105(dd) Additional Federal Authorizations

As the lead agencies for administration of the DWPA, the USCG and MARAD are responsible for the proposed Texas GulfLink license application processing and issuance, and compliance with NEPA and the provisions of other environmental laws that require consultations with federal and state agencies concerning specific environmental resources. While consultations with federal and state agencies may occur concurrently to the NEPA evaluation, permits and approvals constituting major federal action are not issued or obtained until the environmental impacts and all necessary plans to avoid, minimize, and mitigate adverse effects, have been evaluated and the NEPA review has been completed.

Drafts of the following permits have been prepared and are provided in this Deepwater Port Application:

USACE Section 404/10 Permit Application/Coastal Zone Consistency Form	Volume III, Appendix A
USEPA NPDES Onshore Permit Application	Volume III, Appendix P
USEPA NPDES Offshore Permit Application	Volume III, Appendix Q
USEPA Region 6 PSD Air Permit	Volume III, Appendix B
Title V Air Quality Operating Permit Application	Volume III, Appendix D

Federal Authorizations and Permits

The required federal authorizations and permits, approvals, and consultations from the identified agencies to construct, own, and operate a crude oil deepwater port is provided below. Texas GulfLink also considered applicable Federal and State laws and statutes listed within 33 CFR §148.737 of the 1974 Deepwater Port Act (DWPA).

U.S. Maritime Administration (MARAD)

- Deepwater Port Act, License Application

U.S. Coast Guard (USCG)

- Deepwater Port Act, License Application
- National Environmental Policy Act (NEPA)
- Navigational Aids Certification
- Maritime Pollution Prevention Act (MARPOL)
- Hazardous Material Transportation Act (HMTA)

U.S. Army Corps of Engineers, Galveston District (USACE)

- Rivers and Harbors Appropriation Act, Section 10 Authorization
- Clean Water Act (CWA), Section 404 Permit – Dredge and Fill Permit
- National Environmental Policy Act (NEPA) Consultation

U.S. Environmental Protection Agency (USEPA)

- Clean Air Act (CAA), Prevention of Significant Deterioration (PSD) Air Permit Application
- CAA, New Source Review Permit
- CAA, Title V Air Quality Operating Permit Application
- CWA, Section 401, Water Quality Certification Reviews
- CWA, Section 402, National Pollutant Discharge Elimination System (NPDES)

- CWA, General Construction Stormwater Permits for Industrial Activities
- CWA, Construction General Permit
- CWA, Beaches Environmental Assessment and Coastal Health Act (BEACH)
- National Environmental Policy Act (NEPA) Consultation

U.S. Bureau of Ocean Energy Management (BOEM)

- Outer Continental Shelf Lands Act (OCSLA), Right-of-Way (ROW) and Lease Block Issuance
- National Environmental Policy Act (NEPA) Consultation

U.S. Bureau of Safety and Environmental Enforcement (BSEE)

- OCSLA, Oil Pollution Act (OPA) Liability Adjustment Consultation
- Pipeline and Pipeline ROW Permit
- Platform Permit
- Platform Process Safety System Permit
- Single Point Mooring (SPM) Buoy Permit
- National Environmental Policy Act (NEPA) Consultation

U.S. Pipeline and Hazardous Materials Safety Administration (PHMSA)

- National Environmental Policy Act (NEPA) Consultation

U.S. National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA)

- Coastal Zone Management Act (through Texas General Land Office)
- Endangered Species Act (ESA) Consultation
- Marine Mammal Protection Act (MMPA) Consultation
- Magnuson-Stevens Fishery Conservation and Management Act Consultation
- National Invasive Species Act Consultation
- National Environmental Policy Act (NEPA) Consultation

U.S. Fish and Wildlife Service (USFWS)

- Endangered Species Act (ESA) Consultation
- Fish and Wildlife Coordination Act Consultation
- Migratory Bird Treaty Act (MBTA) Consultation
- Coastal Barrier Resources Act Consultation
- National Invasive Species Act Consultation
- National Environmental Policy Act (NEPA) Consultation

U.S. Geological Survey (USGS)

- National Environmental Policy Act (NEPA) Consultation

U.S. Natural Resources Conservation Service (NRCS)

- National Invasive Species Act Consultation
- National Environmental Policy Act (NEPA) Consultation

Advisory Council on Historic Preservation (ACHP)

- National Historic Preservation Act (NHPA) Section 106 Consultation

National Park Service (NPS)

- NHPA Section 106 Consultation

Native American Tribes/Tribal Historic Preservation Officers (THPOs)

- NHPA Section 106 Consultation

State Authorizations and Permits

Texas, Office of the Governor

- Consent of the Governor

Texas General Land Office, Coastal Management Program

- Coastal Zone Management Act (CZMA) Consistency determination
- Oil Spill Prevention and Response Act
- Texas Deepwater Port Procedures Act

Texas Railroad Commission

- CWA, Section 401, Water Quality Certification Reviews
- Hydrostatic Test Discharge Permit
- Permit Application to Operate Product Pipeline, Form T-4

Texas Historical Commission

- NHPA Section 106 Consultation
- Antiquities Code of Texas

Texas Commission on Environmental Quality (TCEQ)

- State Water Quality Standards

Texas Parks and Wildlife Department (TPWD)

- Consistency with State of Texas Threatened and Endangered Species Regulations
- Justin Hurst Wildlife Management Area Consultation

33 CFR §148.105(ee) Sworn Statement

Pursuant to the Deepwater Port Act of 1974, as amended, and implementing regulations at 33 CFR §148.105(ee), I, Jeff Ballard, President and Chief Executive Officer of Texas GulfLink, LLC, attest that to the best of my knowledge, information and belief, the information provided in this application is true.

_____ _____

Jeff Ballard, CEO/President
Texas GulfLink, LLC

Date

SWORN TO AND SUBSCRIBED BEFORE ME, THIS ___ DAY OF MAY, 2019.

NOTARY PUBLIC: _____

MY NOTARIAL COMMISSION EXPIRES: _____