



CREATING NEW MARKETS FOR CLEAN ENERGY

# Project Overview

January 2021





# Introduction



PILOT LNG IS AN ENERGY SOLUTIONS COMPANY, FOCUSED ON THE DELIVERY OF LIQUEFIED NATURAL GAS (LNG) TO BOTH NEW AND EXISTING MARKETS BY DEVELOPING AND OPERATING LNG IMPORT AND LNG FUEL/BUNKERING TERMINALS AND RELATED INFRASTRUCTURE. THE COMPANY AIMS TO ESTABLISH LNG TERMINAL AND LOGISTICS OPPORTUNITIES WORLDWIDE TO MEET GROWING NATURAL GAS DEMAND.



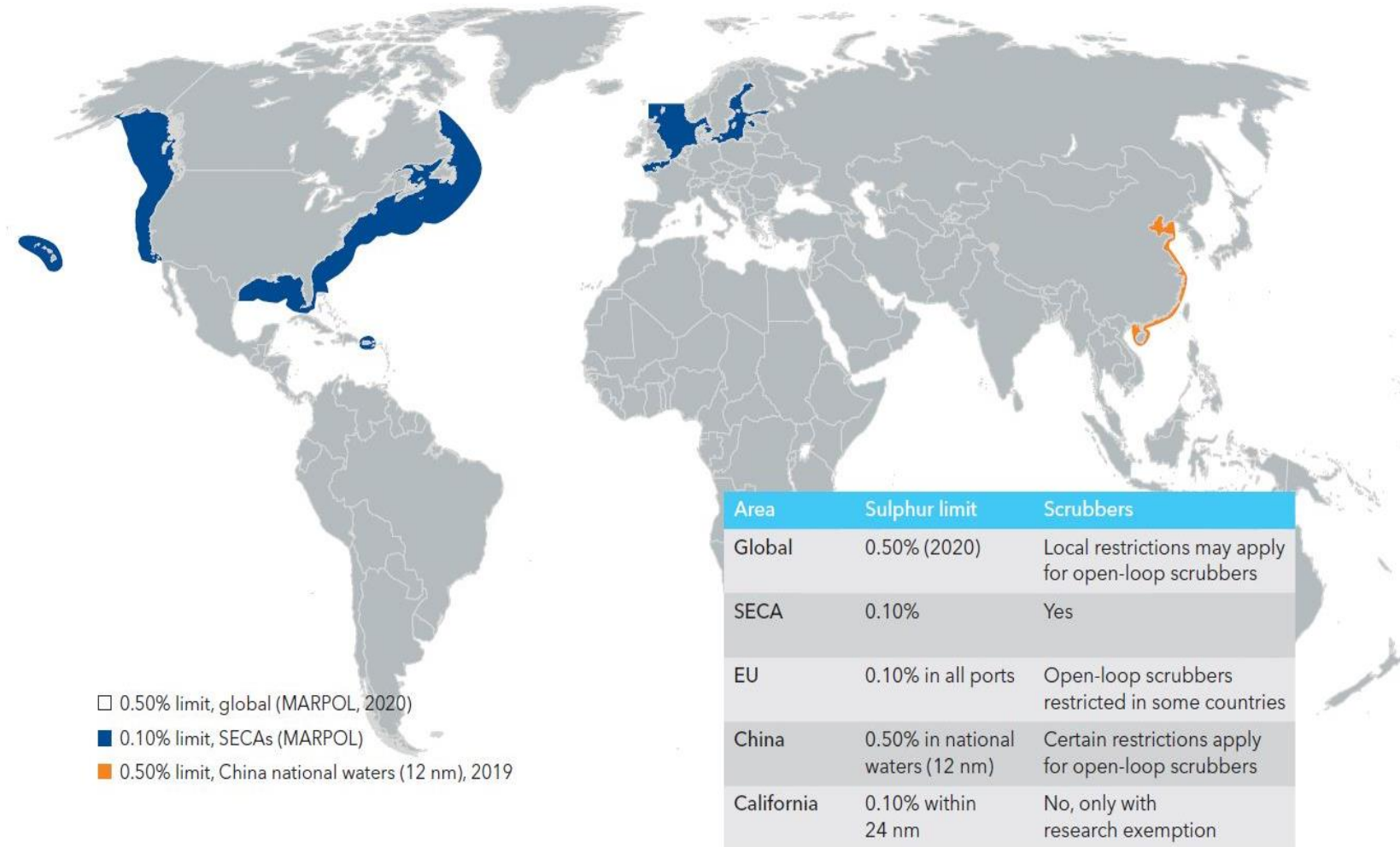
PILOT LNG IS WORKING WITH THE PORT OF GALVESTON ON THE DEVELOPMENT OF AN LNG BUNKER TERMINAL THAT WILL BE LOCATED ON PELICAN ISLAND. THE LNG BUNKER FUEL WILL SERVE THE GREATER GALVESTON / HOUSTON PORT COMPLEX BY SUPPLYING CLEAN BURNING LNG TO THE RAPIDLY EXPANDING FLEET OF LNG-FUELED VESSELS.



# Why LNG as a Marine Fuel?



- New international regulations **effective January 01, 2020** require the shipping industry to burn fuels with <0.5% Sulphur (SO<sub>x</sub>) globally
  - In certain regions (US, Europe), the regulations are more stringent <0.1%
- LNG has much lower emissions than conventional marine fuels
  - **LNG emits zero SO<sub>x</sub>**
  - **LNG has virtually no particulate matter**
  - **LNG emits 90% less NO<sub>x</sub> vs. conventional HFO**
- LNG as a marine fuel is less costly when compared to low Sulphur fuel oil



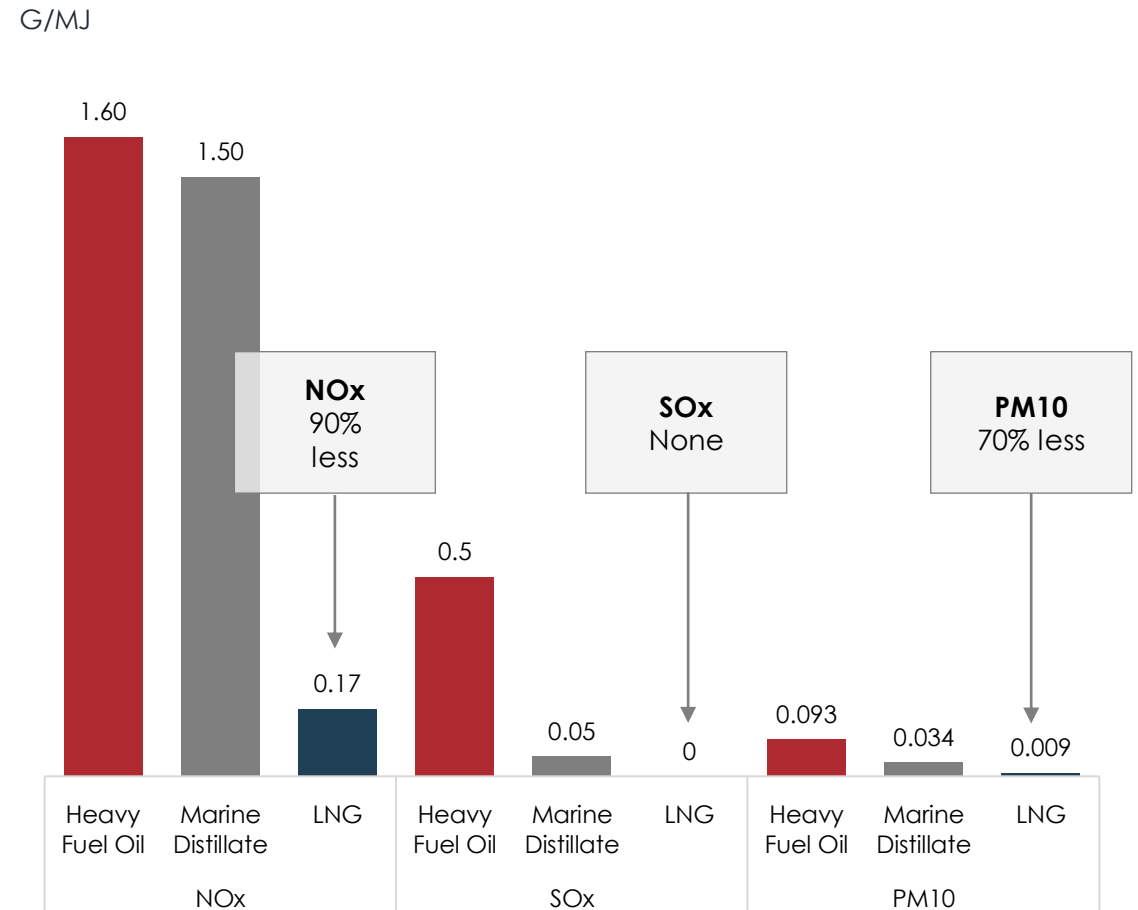
# LNG Plays an Important Role in a Cleaner Energy Future



## Pilot LNG's Environmental Goals

- 1 Protect and Preserve The Environment
- 2 Provide Cleaner Energy Solutions
- 3 Minimize our Environmental Footprint
- 4 Become a Leader in Safe and Cost Effective Operations
- 5 Develop New Best-in-Class LNG Project Opportunities

## LNG as Marine Fuel Will Provide Cleaner Air





# Global LNG Bunkering Infrastructure in Operation

81 Ports/Terminals Supplying LNG Fuel – Estimated 6,000+ Bunker Transfers so Far



## LNG Bunkering:

- LNG Bunkering Vessel - 19
- LNG Bunkering Infrastructure - 87
  - Truck Loading
  - Bunker Vessel Loading
  - Local Storage
  - Tank to Ship
  - Other Bunkering

## Top 10 Bunkering Ports In The World:

- Singapore
- Rotterdam
- Fujairah
- Hong Kong
- Antwerp
- Busan
- Gibraltar
- Panama
- Algeciras
- Los Angeles/Long Beach



# Galveston LNG Bunker Port



## Concept and Description

- Land-based infrastructure
- Floating gas liquefaction and storage unit
  - Liquefaction capacity 0.5 Mtpa (Nameplate)
  - Storage capacity 18,000 m<sup>3</sup>
  - Hull permanently moored
  - Electric powered by **Renewable Energy** sources
- Bunkering vessel delivers LNG to ship
- Established gas supply from the Houston Pipeline System Intrastate System (Energy Transfer)
- Located on Pelican Island, ideally situated within the largest port complex in the US
- Easy access for all ships calling on the Ports of Galveston, Houston, and Texas City
- The Galveston Bay Port Complex does not have any competing infrastructure for delivery of LNG as marine fuel



# From Natural Gas to LNG as Marine Fuel



Gas Supply - Land Based Infrastructure – Floating Liquefaction and Storage – LNG Barge Distribution



1 Gas Supply



2 Land Based Infrastructure



Alternative Gas Pipeline 1

Alternative Gas Pipeline 2



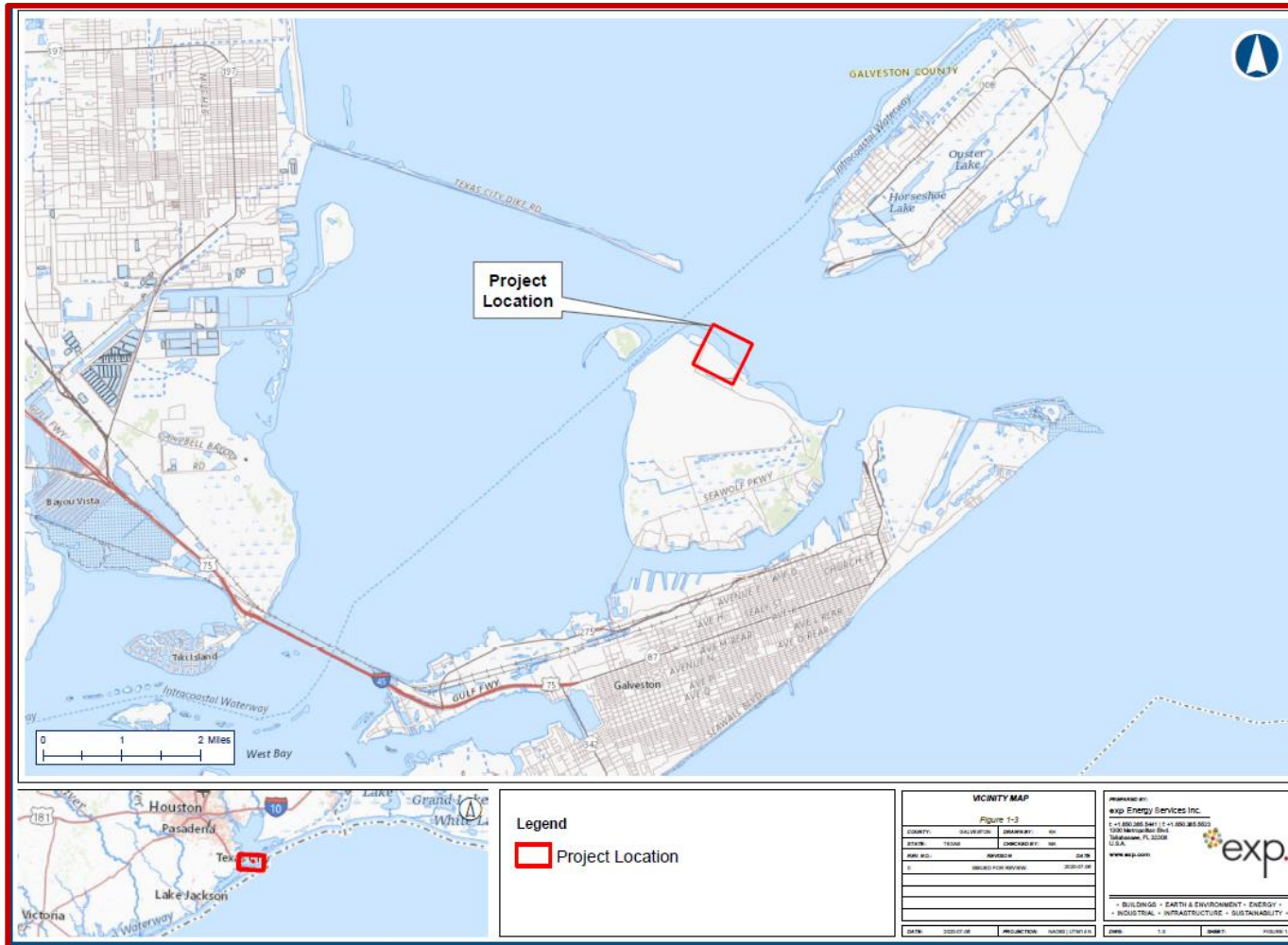
3 Floating Liquefaction and Storage Unit



4 LNG Barge Distribution

# Project Location

Galveston Bay has 62% of all deep draft vessels that port in the State of Texas. In 2019 there were over 10,500 deep draft port arrivals in Galveston Bay along with over 133,000 tug/tow barge movements on the Houston Ship Channel.

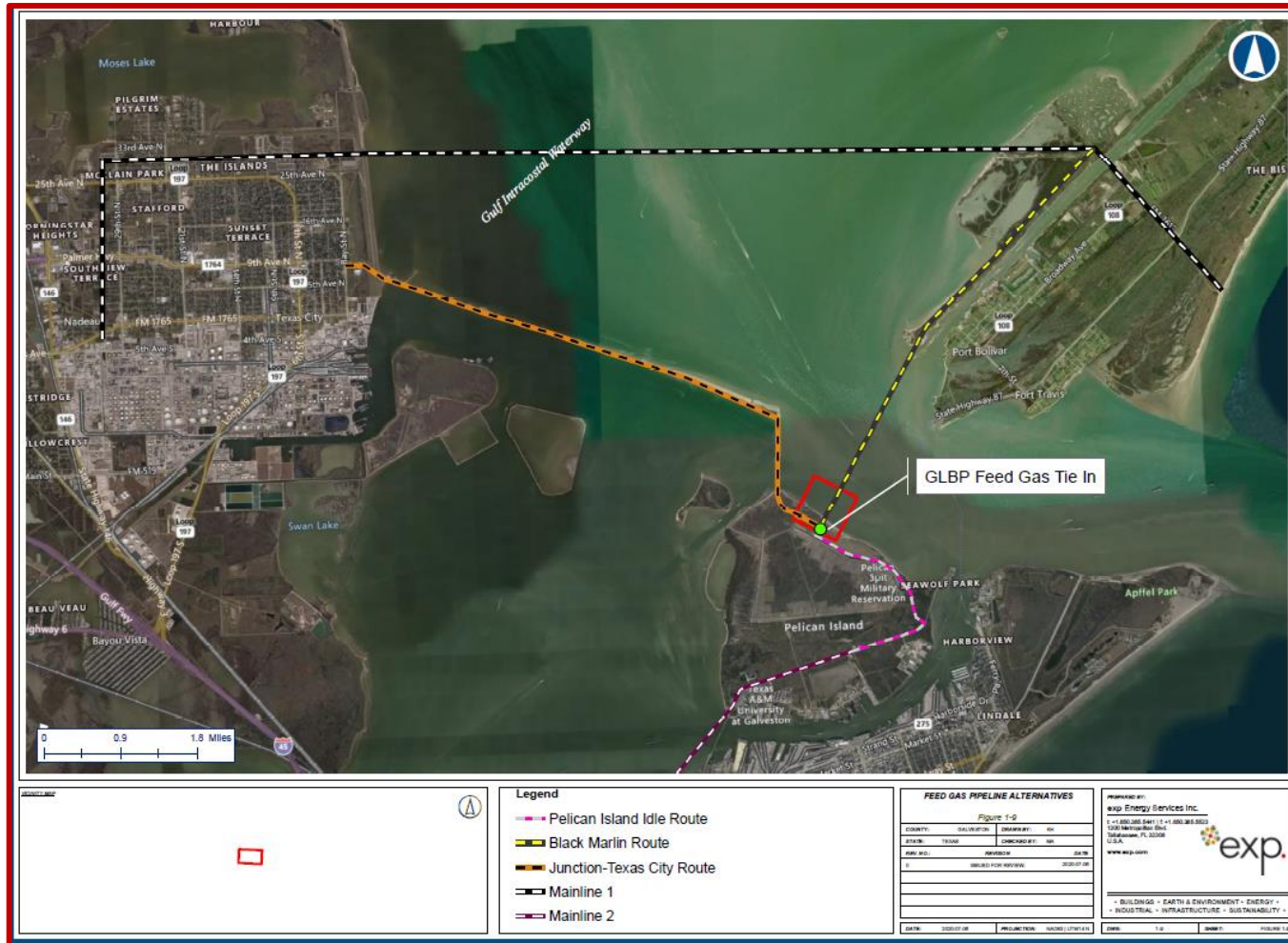


## Site is located on Pelican Island, Galveston, TX

- Site is **heavily industrial**, and at the entrance to both the Texas City Ship Channel & Houston Ship Channel
- Bolivar Roads anchorage is located to the immediate east of the site location, in the Galveston Bay
- Major cruise terminal in the Port of Galveston
  - **~300 port calls/sailings in 2019**
  - Announced new cruise terminal #3 in October 2019 adding 59 future sailings and with a capacity to add a further 100 sailings
  - **Cruise industry early adopters** of LNG as a marine fuel
- Site has **ample waterfront acreage** with direct access to the Texas City Ship Channel, Houston Ship Channel and the Galveston Channel, all maintained at a depth of 45-feet.
- Short transit to Gulf of Mexico for any offshore bunkering requirements

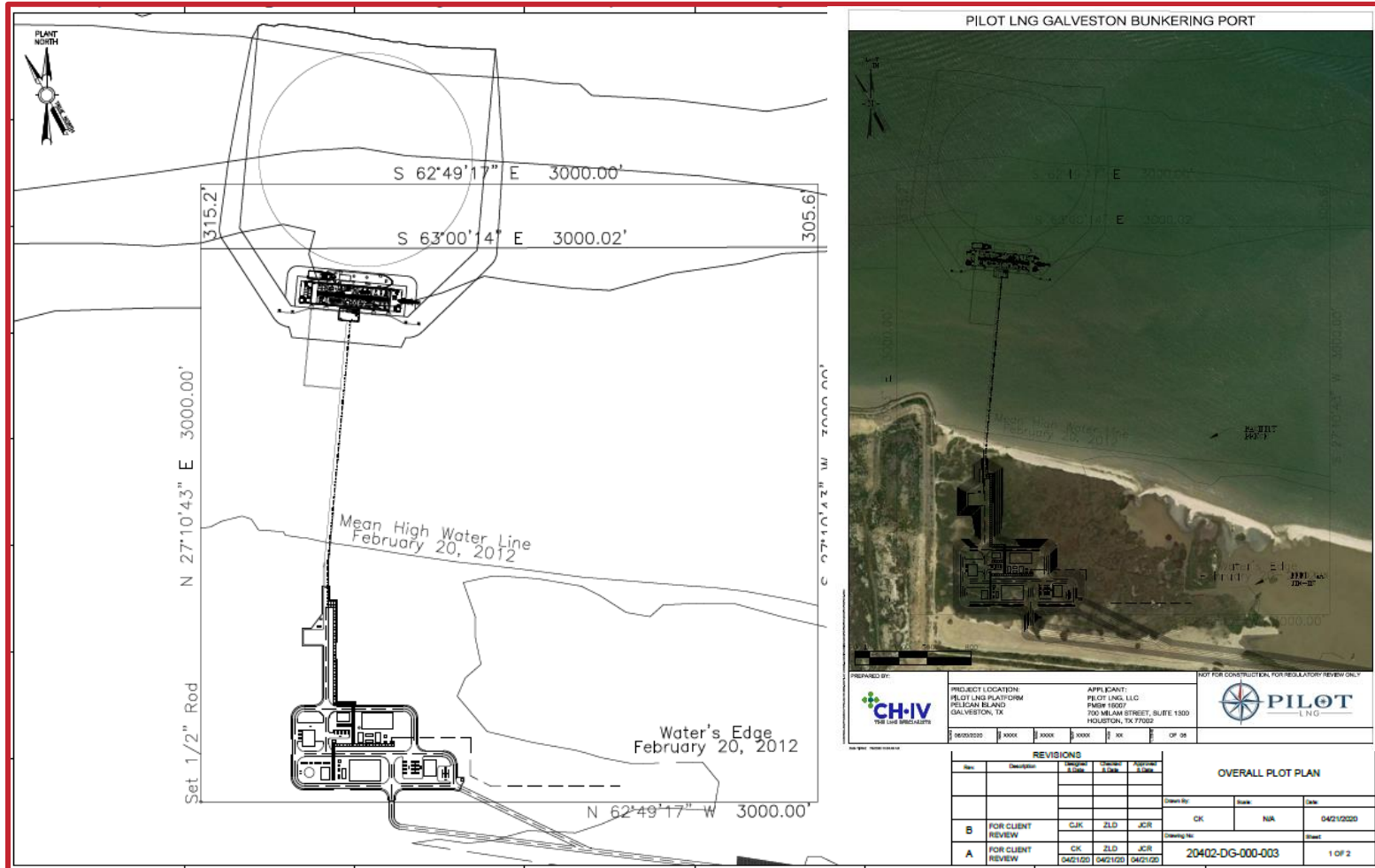


# Project Gas Pipelines & Gas Supply



- **Project:** Galveston LNG Bunker Port
- **System:** Houston Pipeline System (Energy Transfer) Intrastate System
- **Description:**
  - Expansion of the current 12-inch HPL system on Pelican Island approximately 2.79 miles in length to GLBP “City Gate”
  - Alternative route is a new build lateral from the Texas City system down the Texas City dyke approximately 6.91 miles
  - A 3<sup>rd</sup> route would take advantage of the abandoned Black marlin system from Texas City to Bolivar Roads, and a new build lateral across under the HSC to the site

# Project Layout

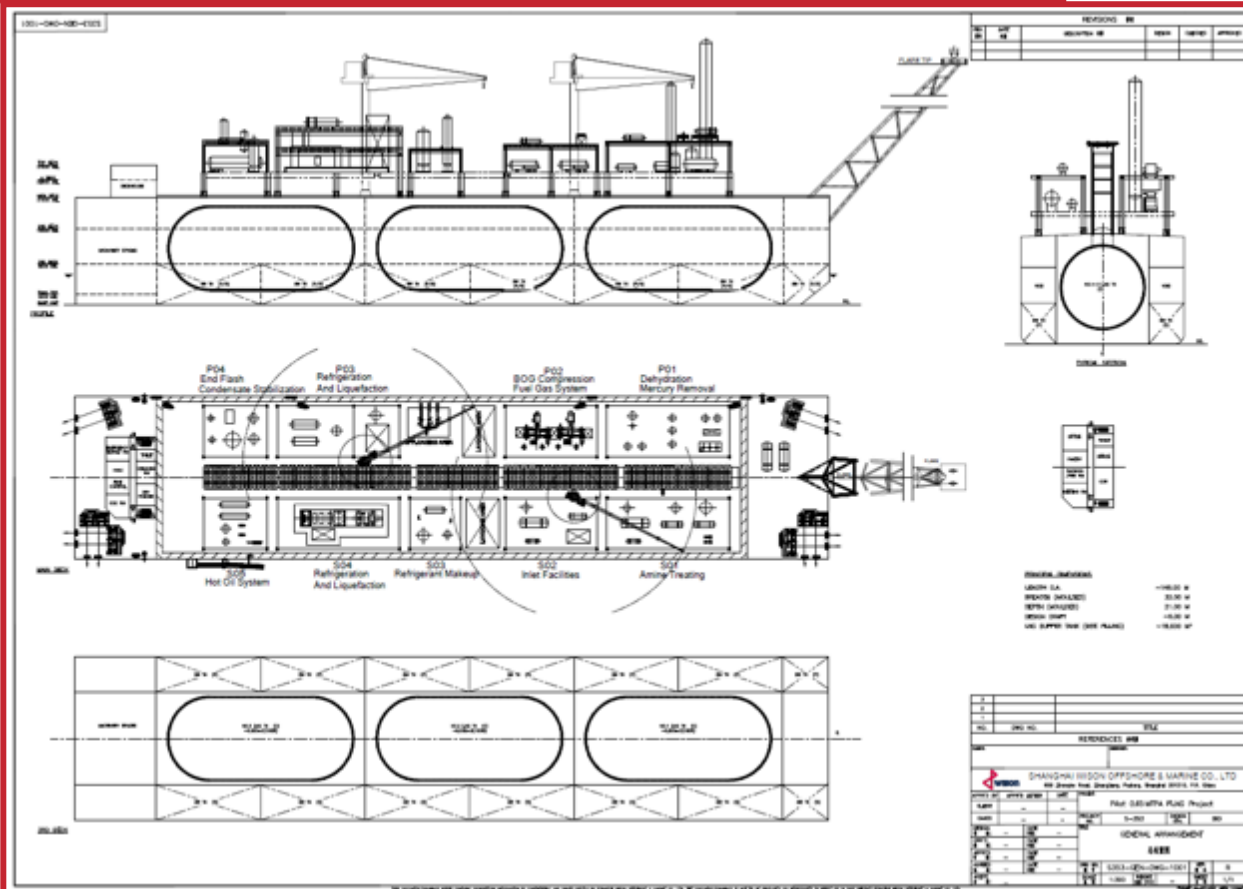


- **Project:** Galveston LNG Bunker Port
- **System:** Land-based infrastructure – Site/shore layout (~13 acres)
- **Description: Key Components**
  - Control Room/Administration Building
  - Warehouse/Workshop Building
  - Switchgear/MCC Building
  - Firewater Pumphouse Building
  - Feedgas Compressor
  - Potable Firewater Tank
- **System:** Marine/Jetty infrastructure – Main Platform
- **Description: Key Components**
  - Gangway Tower
  - High Pressure Gas Arm
  - Berth Operator Shelter
  - Diesel Firewater Pump Package
  - Ship to Shore Power Supply
  - Hydraulic Power Unit

# Floating LNG Bunkering Technology



Designed specifically for the US market & regulatory requirements



- **Project:** Galveston LNG Bunker Port
- **System:** Floating gas liquefaction and storage unit
- **Description**
  - Length 148m (486 ft.) \* Breadth 32m (105 ft.) \* Depth 21m (69 ft.)
  - Design Draught: 6.0m (19.7 ft.)
  - Throughput
    - Liquefaction: 82 Mmscf/d ( $\approx$  0.50 nameplate Mtpa)
    - Storage: 18,000m<sup>3</sup> (Type-C tank)
    - Hull: permanently-moored, non-propelled
  - Design
    - Barge: Wison
    - Liquefaction technology: Encryo (Baker Hughes) Single Mixed Refrigerant (SMR)
    - Storage and Cargo Handling: TGE
- **Contract Type:** Turnkey EPCIC
- **Operational Status:** Original *Tango FLNG* held successful gas trial in Sep 2016, at Wison's Nantong Shipyard, delivered in Jan 2017. Currently operating in Argentina (Bahia Blanca) for YPF



# Regulatory & Permitting Process



There Is No Requirements For FERC Permit Process for GLBP, Which Shortens The Process By 2+ Years

Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
<p>Origination &amp; Development</p>	<p>Consultation &amp; Coordination</p>	<p>Regulatory Review &amp; Risk Assessment</p>	<p>Pre-Operational, Final Permit Review &amp; Approval</p>	<p>Operational</p>
<p>Determine the scope of the project, identify potential locations, &amp; determine regulatory requirements.</p> <p>Execute key early agreements; site exclusivity &amp; 3rd party engineering and design, regulatory &amp; permitting expertise.</p> <p>Evolve engineering &amp; design for initial application(s), stakeholder outreach (agency &amp; community)</p>	<p>File preliminary application(s), consult with Government agencies (Federal, State, and Local) and other stakeholders, to determine permitting, certification &amp; regulatory requirements needed.</p> <p>Evolve engineering &amp; design and subsequent environmental impacts and mitigation, based on agency feedback, continue with stakeholder outreach (agency &amp; community)</p>	<p>Conduct the risk assessments required by local, state &amp; federal regulators.</p> <ul style="list-style-type: none"> <li>• Fire risk assessment</li> <li>• Process hazard analysis</li> <li>• Siting study: exclusion area analysis</li> <li>• Simultaneous operations assessment</li> <li>• Waterway Suitability Assessment: safety &amp; security</li> </ul>	<p>Prepare for operations by filing all permits, establishing all programs, and submitting plans, processes, and procedures, for review &amp; final approval.</p> <ul style="list-style-type: none"> <li>• Emergency Response Plan                             <ul style="list-style-type: none"> <li>• Spill Response Plan</li> <li>• Operations Manual/Operations Procedures</li> </ul> </li> <li>• Vessel Fuel Transfer Procedures</li> <li>• Letter of Intent &amp; WSA</li> <li>• Security Plan &amp; Security Assessment</li> <li>• Risk Management Plan</li> </ul>	<p>Begin Operations by fulfilling the proscribed requirements.</p> <ul style="list-style-type: none"> <li>• Training/Credentialing Program</li> <li>• Safe Work Practices Program</li> <li>• Incident Investigation Program</li> <li>• Corrective &amp; Preventative Actions Program</li> <li>• Hot Work Permit Program                             <ul style="list-style-type: none"> <li>• Process Safety Management Program</li> </ul> </li> <li>• Contractor Safety Program                             <ul style="list-style-type: none"> <li>• Safety Management System</li> </ul> </li> </ul>



# Development Schedule



	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021
<b>Phase 1</b> <ul style="list-style-type: none"> <li>Execute site agreement with Port of Galveston</li> <li>Prepare Permitting Roadmap (Part of the Critical Issues Analysis)</li> </ul>	◆	<b>Phase #1</b>	Executed agreement with Eng. & Design Teams & Reg road map. Executed agreement with Port of Galveston on site exclusivity (MOU)					
<b>Phase 2</b> <ul style="list-style-type: none"> <li>Identify Stakeholders and Adjacent Landowners</li> <li>Prepare and Issue Agency Pre-Application Consultation Letters</li> <li>Outreach for Application meetings with regulatory agencies</li> </ul>		◆	<b>Phase #2</b>	Completed conceptual Eng., desk top Env. & Reg. Outreach				
<b>Phase 3</b> <ul style="list-style-type: none"> <li>Draft and Submit Permit Applications and Consultations Requests</li> <li>Perform environmental and cultural surveys if required (based on agency consultation)</li> <li>Begin to prepare EA to support Permit Applications and Regulatory</li> </ul>		◆		<b>Phase #3 and #4</b>	Expected Filing of Application: Will have engaged regulatory agencies in discussions related to concept and opportunity.			
<b>Phase 4</b> <ul style="list-style-type: none"> <li>Begin WSA Process and draft Preliminary WSA</li> <li>File Public Notices</li> <li>Submit Preliminary WSA and hold WSA Workshops</li> <li>Submit Follow On WSA</li> </ul>				◆				
<b>Phase 5</b> <ul style="list-style-type: none"> <li>Answer Agency Data Requests</li> <li>Respond to Permit Public Commits</li> <li>Receive and Review Draft Permit Conditions</li> </ul>					◆	<b>Phase #5</b>		
<b>Phase 6</b> <ul style="list-style-type: none"> <li>Receive Letter Of Recommendation</li> <li>Receive Permits (Construction Permits and Clearance Letters)</li> <li>Perform Mitigation (if required, can be done at FID or during construction)</li> <li>Request Notice to Proceed to Construction</li> </ul>						<b>Phase #6</b>	FID	◆



# Key Benefits

- Ideal location to produce LNG marine fuel within the largest port complex in the USA
- Providing LNG bunker fuel at the market avoids costly transportation from remote supply sources along the US Gulf Coast
- Producing LNG bunkers in Texas provides access to less expensive feed gas
- Eliminates LNG shipping and terminal costs when compared to LNG bunkers in Europe or Asia
- Using proven floating liquefaction technology reduces execution risk and costs
- Permitting process reduces time to market by ~2 years compared to FERC timeline
- Final Investment Decision (FID) expected Q4 2021/ Q1 2022
- In-Services date estimated Q4 2024 / Q1 2025
- Pilot LNG offering flexible commercial structures



# Key Strategic Partners



**Port of Galveston**



- Site exclusivity agreement executed

**W. F. Baird**



- Marine/Jetty fixed infrastructure civil engineering & design and dredge disposal plan

**Wison**



- FLNG Basis of Design
- FLNG FEED (Front End Engineering & Design)
- FLNG EPCIC (EPC, Installation, & Commissioning)

**Energy Transfer Partners / Houston Pipeline Co.**



- Gas pipeline infrastructure

**EXP Environmental Services Inc.**



- Regulatory and permitting

**AcuTech**



- Waterway Suitability Analysis regulatory requirements

**CH-IV/Clough**



- Land-based fixed infrastructure including marine topsides Basis of Design, Pre-FEED & FEED

**Fugro**

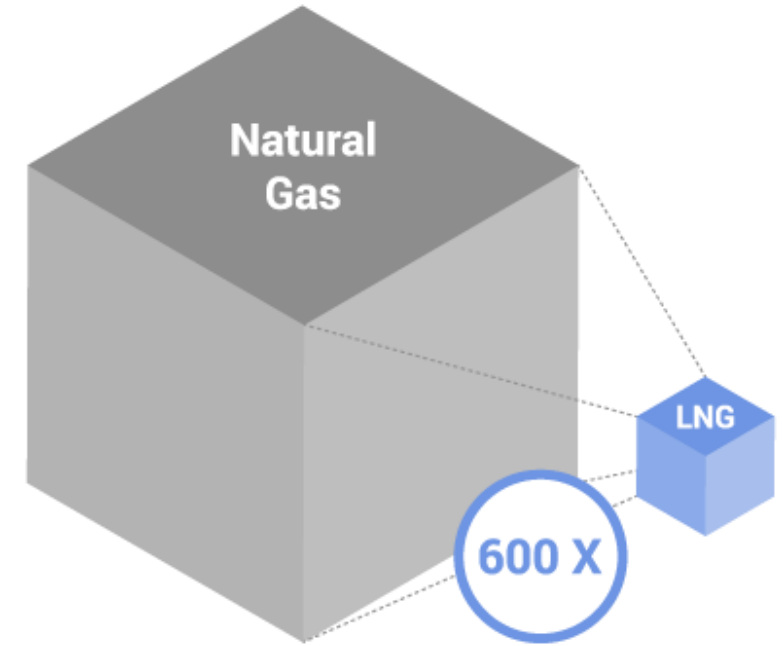


- Geophysical and geotechnical analysis



# What is LNG?

- LNG is an odorless, non-toxic and non-corrosive liquid
- LNG is not stored under high-pressure, is not flammable and is not explosive
- LNG has been safely and securely shipped around the world for more than 50 years
- LNG does not pose a contamination risk



Natural gas is converted to LNG by super-cooling it to  $-260^{\circ}\text{F}$



At which point it becomes a liquid, reducing its volume by a factor of more than 600.



# Common Myths & Misconceptions



- MYTH** LNG is explosive
- MYTH** LNG facilities smell
- MYTH** LNG projects are rubberstamped by the government & agencies
- MYTH** The proposed LNG terminal is too close to communities to be safe
- MYTH** LNG vessels will shut down the channel for days at a time
- MYTH** LNG facilities will destroy the local environment and poison the air
- MYTH** LNG facilities will ruin the tourism industry

- FACT** LNG as a liquid is non-flammable and non-explosive
- FACT** Unlike oil refineries and complex chemical facilities, LNG terminals do not put out noxious or malodorous emissions
- FACT** US LNG projects undergo an extremely rigorous review process ensuring safety and environmental responsibility
- FACT** In the unlikely event of an incident, any potential significant impacts would be contained onsite, as required by regulation
- FACT** Channel operations would continue mostly unaltered with safety and security procedures controlled by the Coast Guard
- FACT** The agency environmental review process ensures that projects meet or exceed all environmental requirements
- FACT** LNG projects must meet or exceed all air quality requirements, which are in place to protect the public health and environment
- FACT** In ports around the world, LNG terminals coexist with thriving tourism and local industries In fact LNG is becoming the fuel of choice for the Cruise Industry LNG is explosive





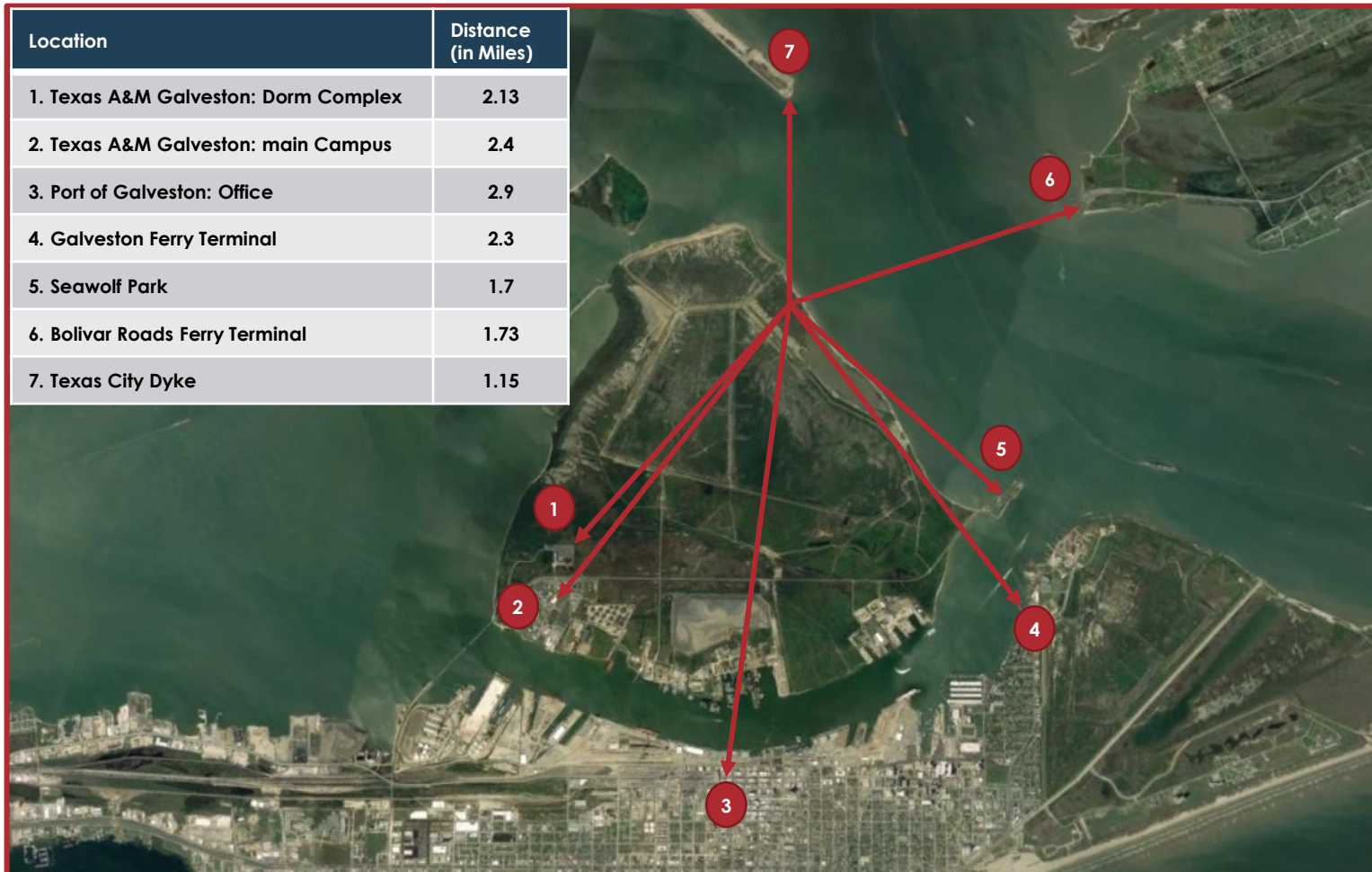
# LNG – Excellent Safety Record

- The bulk LNG transportation industry, where LNG is commonly used as a fuel for the transporting vessel, has an excellent safety record.
  - Over the past 50 years, more than 77,000 commercial LNG cargoes have been safely delivered and global LNG shipments have covered more than 100 million miles – about 4,000 times around the earth – without any major safety incidents in port or at sea.
  - This is testament to the LNG industry's rigorous design guidelines for both ships and shore facilities, as well as high standards of training and operational procedures.
- The use of LNG as a marine fuel outside the LNG carrier business is a relatively new technology, as are gas only and dual-fueled engines.
  - Since its introduction as a marine fuel at the turn of the century, LNG-fueled vessels and associated bunkering operations have had an exemplary safety record.
  - For example, the Viking Grace cruise ferry has bunkered, without incident, more than 1,000 times in Stockholm since its entry into service in 2012.

# Location, Size & Safety



Galveston LNG Bunker Port is a small scale LNG facility and compared to the export projects in Texas & Louisiana, only a fraction of the size. It is more like a corner gas station for marine vessels, than a major industrial export complex.



Texas/LA Export Projects & Metric	Compare	Small Scale Project & Metric
<b>Cheniere Sabine Pass</b>	versus	<b>Galveston LNG Bunker Port (GLBP)</b>
<b>Storage:</b> 5 Tanks 3 @ 160,000 m3 2 @ 180,000 m3 <b>Total: 840,000 m3</b>	<b>2.1%</b>	<b>Storage:</b> 3 Tanks 3 @ 6,000 m3 <b>Total: 18,000 m3</b>
<b>Production:</b> 6 Trains <b>Total: 30 Mtpa</b>	<b>2.2%</b>	<b>Production:</b> 1 Train <b>Total: 0.65 Mtpa</b>
<b>Freeport LNG</b>	versus	<b>GLBP</b>
<b>Storage:</b> 3 Tanks 2 @ 160,000 m3 1 @ 165,000 m3 <b>Total: 485,000 m3</b>	<b>3.7%</b>	<b>Storage:</b> 3 Tanks 3 @ 6,000 m3 <b>Total: 18,000 m3</b>
<b>Production:</b> 3 Trains <b>Total: 15 Mtpa</b>	<b>4.3%</b>	<b>Production:</b> 1 Train <b>Total: 0.65 Mtpa</b>



# Summary

- Strong outlook for LNG bunker market due to new emissions standards
  - Strong fundamentals highlighted by rapid growth in Europe & Asia, and marine industry order book for LNG powered vessels
- LNG as a marine fuel is highly competitive with low sulfur marine fuels
  - Long term economics favor LNG over petroleum based marine fuels
- Excellent location to serve the growing LNG marine fuels market including the cruise ship sector in Galveston, as well as the dual fuel tanker, container, car carriers calling the ports of Houston/Galveston/Texas City
- Unmatched location for a combination of early adopters, and market depth (largest port complex in US)
- Pilot LNG has exclusivity on the site and has completed initial due diligence & fatal flaw analysis and has not found any show stoppers
- Well defined, Non-FERC, expedited clear permitting path identified
- Strong team assembled to perform pre-FEED & FEED to FID
- Highly experienced management team with proven track record in developing both US energy & global energy infrastructure projects



Thank You! We look forward to further discussions.

**Contact:**  
[info@pilotlng.com](mailto:info@pilotlng.com)



**PILOT**  
— LNG —